
Pylced Documentation

Release 0.3.0a7

René Kijewski

Jun 09, 2022

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Python bindings for **Iced**.

Iced is a cross-platform GUI library focused on simplicity and type-safety. Inspired by Elm.

INSTALLATION

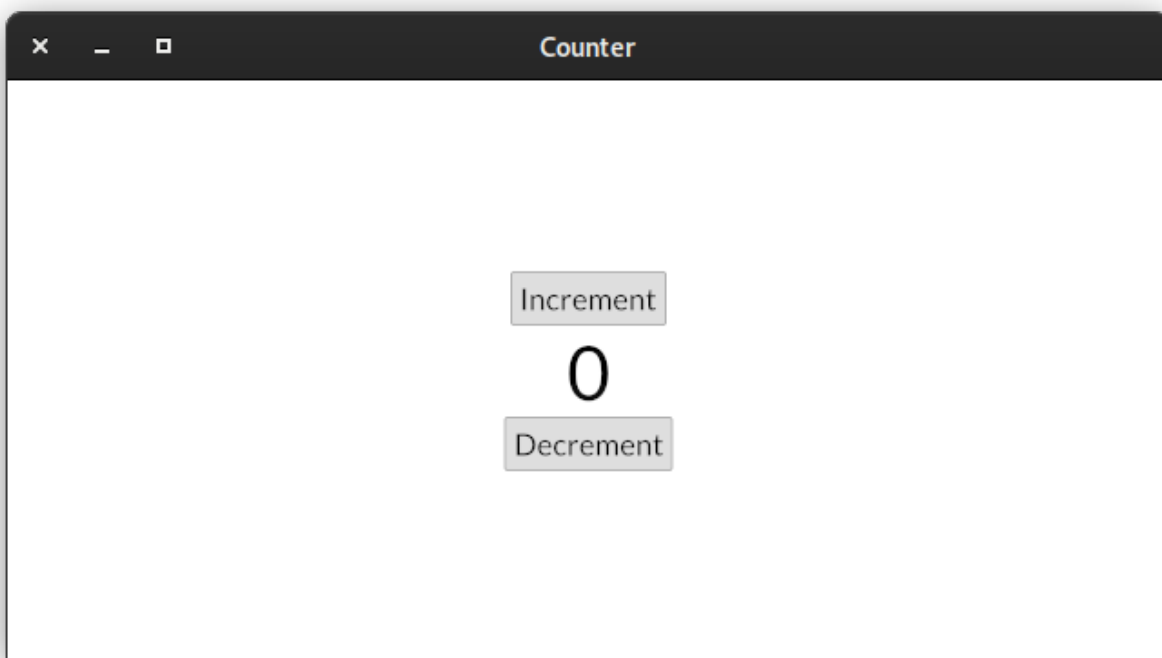
```
$ pip install pyiced
```

To install from source you need to have a recent version of **Rust** installed in your \$PATH.

Rustup is probably the most easy to use option to install and update **Rust** on your system.

QUICK EXAMPLE

A simple counter with two buttons to increment and decrement a value:



```
from pyiced import (
    Align, button, ButtonState, column, container, IcedApp, Length, text,
)

class ExampleApp(IcedApp):
    def __init__(self):
        self.__incr_button_state = ButtonState()
        self.__decr_button_state = ButtonState()
        self.__value = 0

    def title(self):
        return 'Counter'

    def view(self):
```

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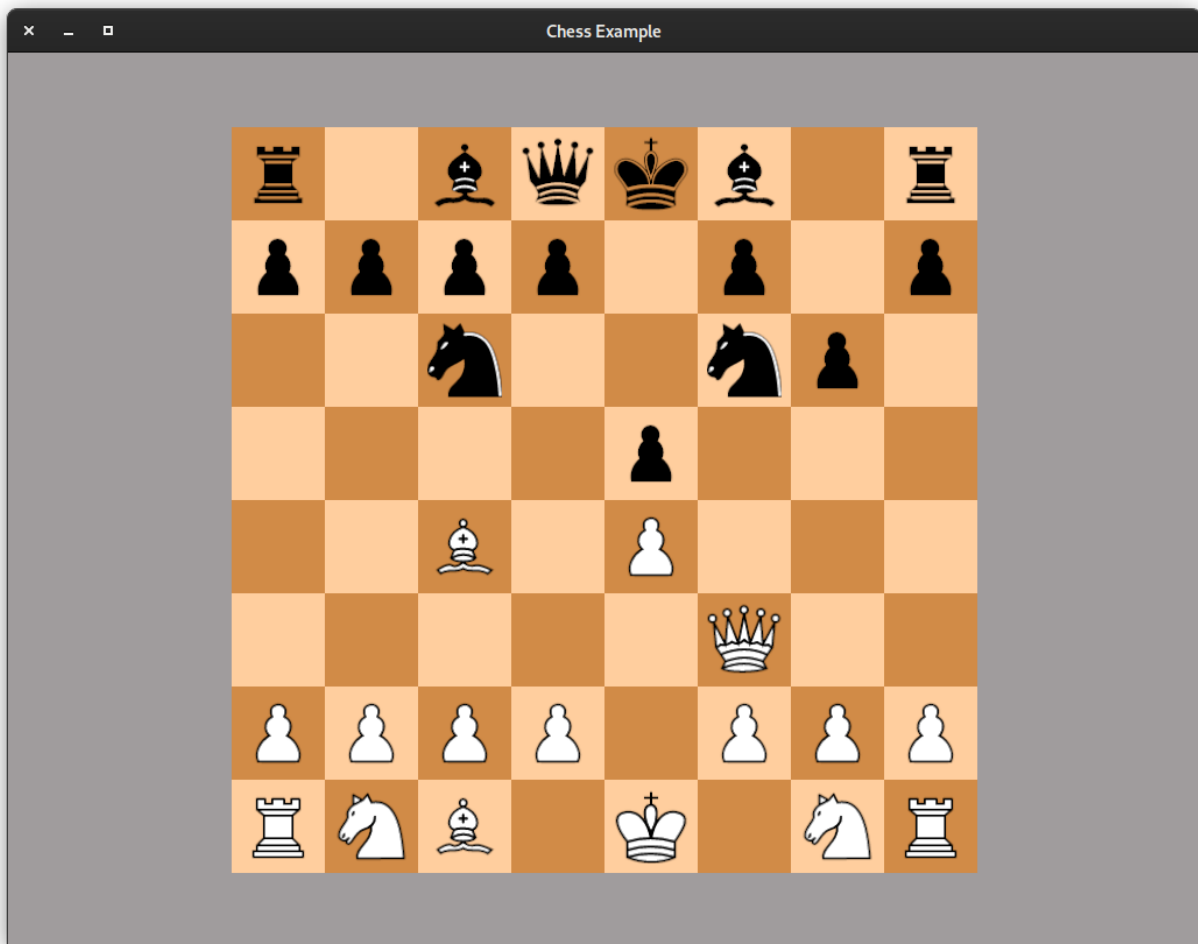
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```
increment_button = button(
    self.__incr_button_state, # To track the state across redraws.
    text('Increment'),        # This is content on the button.
    on_press='incr',          # This value is received in update().
)
value_label = text(f'{self.__value}', size=50)
decrement_button = button(
    self.__decr_button_state,
    text('Decrement'),
    on_press='decr',
)
return container(
    column(
        [increment_button, value_label, decrement_button],
        align_items=Align.CENTER,
    ),
    padding=20, align_x=Align.CENTER, align_y=Align.CENTER,
    width=Length.FILL, height=Length.FILL,
)

def update(self, msg, clipboard):
    # When an event occurs, this method is called.
    # It can optionally return a list of async functions,
    # to handle the event.
    match msg:
        case 'incr':
            self.__value += 1
        case 'decr':
            self.__value -= 1

if __name__ == '__main__':
    # This function only returns if there is an error on start-up.
    # Otherwise the program gets terminated when the window is closed.
    ExampleApp().run()
```

BIGGER EXAMPLE



Please find the source code in the [examples/chess.py](#).

TABLE OF CONTENTS

4.1 Usage Examples

4.1.1 Quick Example

A simple counter with two buttons to increment and decrement a value:



```
from pyiced import (
    Align, button, ButtonState, column, container, IcedApp, Length, text,
)

class ExampleApp(IcedApp):
    def __init__(self):
        self.__incr_button_state = ButtonState()
        self.__decr_button_state = ButtonState()
```

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```
self.__value = 0

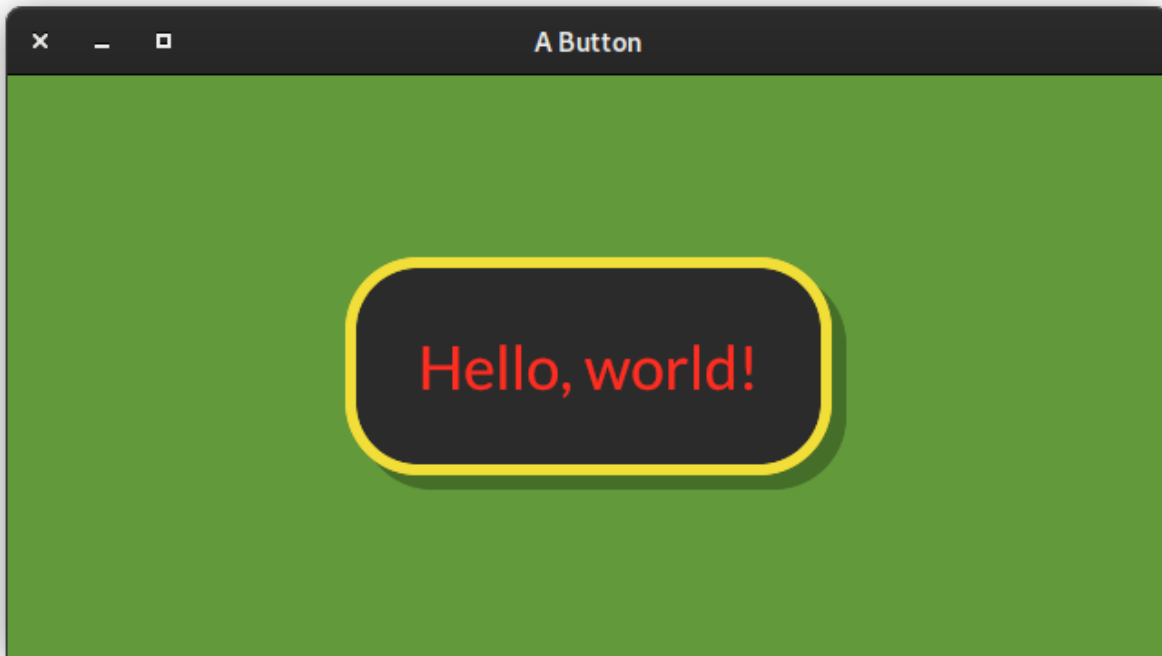
def title(self):
    return 'Counter'

def view(self):
    increment_button = button(
        self.__incr_button_state, # To track the state across redraws.
        text('Increment'), # This is content on the button.
        on_press='incr', # This value is received in update().
    )
    value_label = text(f'{self.__value}', size=50)
    decrement_button = button(
        self.__decr_button_state,
        text('Decrement'),
        on_press='decr',
    )
    return container(
        column(
            [increment_button, value_label, decrement_button],
            align_items=Align.CENTER,
        ),
        padding=20, align_x=Align.CENTER, align_y=Align.CENTER,
        width=Length.FILL, height=Length.FILL,
    )

def update(self, msg, clipboard):
    # When an event occurs, this method is called.
    # It can optionally return a list of async functions,
    # to handle the event.
    match msg:
        case 'incr':
            self.__value += 1
        case 'decr':
            self.__value -= 1

if __name__ == '__main__':
    # This function only returns if there is an error on start-up.
    # Otherwise the program gets terminated when the window is closed.
    ExampleApp().run()
```

4.1.2 Custom Styles



```

from pylced import (
    Align, button, ButtonState, ButtonStyle, ButtonStyleSheet, Color,
    container, ContainerStyle, IcedApp, Length, Settings, text,
    WindowSettings,
)

class ButtonExample(IcedApp):
    class settings(Settings):
        class window(WindowSettings):
            size = (640, 320)

    def __init__(self):
        self.__button_state = ButtonState()

    def title(self):
        return 'A Button'

    def view(self):
        styled_button = button(
            self.__button_state,
            text('Hello, world!', size=40),
            '',
            style=ButtonStyleSheet(ButtonStyle(
                shadow_offset=(8, 8), border_radius=40, border_width=6,
                background=Color(0.17, 0.17, 0.17),
                border_color=Color(0.95, 0.87, 0.22),
            ))
        )

```

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```

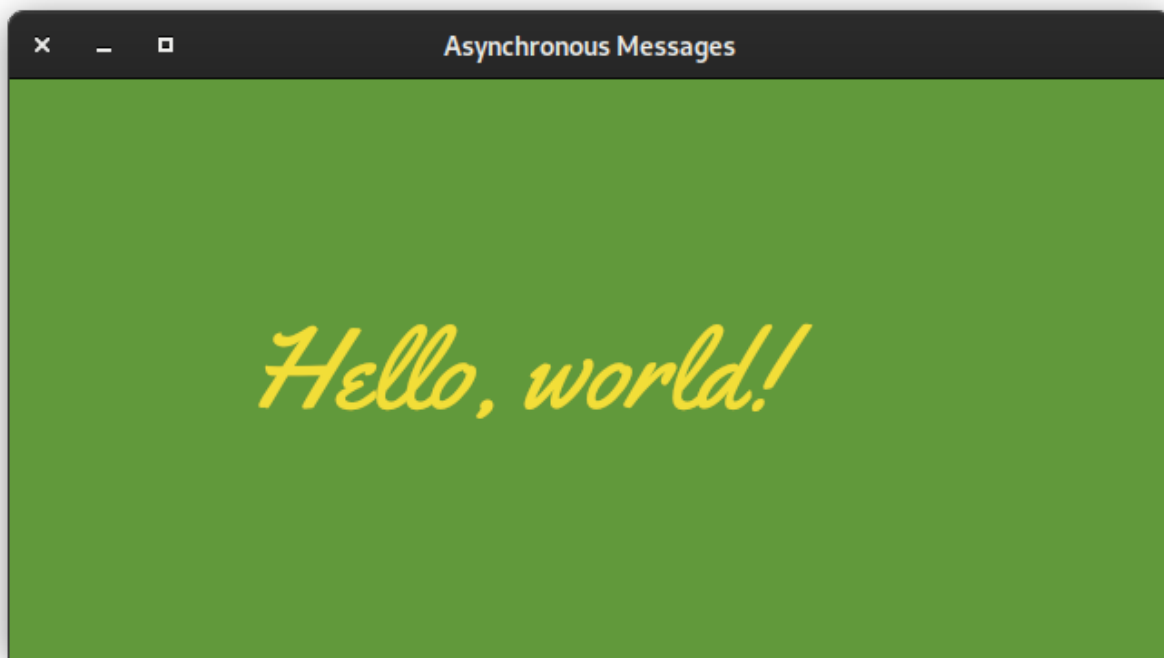
        text_color=Color(1.00, 0.18, 0.13)
    ),
    padding=40,
)
return container(
    styled_button,
    style=ContainerStyle(background=Color(0.38, 0.60, 0.23)),
    padding=20, align_x=Align.CENTER, align_y=Align.CENTER,
    width=Length.FILL, height=Length.FILL,
)

if __name__ == '__main__':
    ButtonExample().run()

```

4.1.3 Asynchronous Messages

`new()` and `update()` can either return a `Message` (or a sequence of messages in the latter case), or a `coroutine` / `coroutines` to asynchronously generate a messages.



```

from asyncio import open_connection
from contextlib import closing

from pylced import (
    Align, Color, container, ContainerStyle, Font, IcedApp, Length,
    Settings, text, WindowSettings,
)

```

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```

class AsyncMessageExample(IcedApp):
    def __init__(self):
        self.__font = None

    class settings(Settings):
        class window(WindowSettings):
            size = (640, 320)

    def title(self):
        return 'Asynchronous Messages'

    def new(self):
        return [load_font()]

    def update(self, msg, clipboard):
        match msg:
            case ('Font', font):
                self.__font = font

    def view(self):
        return container(
            text('Hello, world!', size=80, font=self.__font),
            style=ContainerStyle(
                text_color=Color(0.95, 0.87, 0.22),
                background=Color(0.38, 0.60, 0.23),
            ),
            padding=20, align_x=Align.CENTER, align_y=Align.CENTER,
            width=Length.FILL, height=Length.FILL,
        )

async def load_font():
    FONT_NAME = 'Yellowtail'
    FONT_HOST = 'fonts.cdnfonts.com'
    FONT_PATH = '/s/16054/Yellowtail-Regular.ttf'

    query = (
        f"GET {FONT_PATH} HTTP/1.0\r\n"
        f"Host: {FONT_HOST}\r\n"
        f"Connection: closed\r\n"
        f"\r\n"
    ).encode('US-ASCII')

    reader, writer = await open_connection(FONT_HOST, 443, ssl=True)
    with closing(writer):
        writer.write(query)
        await writer.drain()
        while (await reader.readline()) != b'\r\n':
            continue

```

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```

        data = await reader.read()
        await writer.wait_closed()

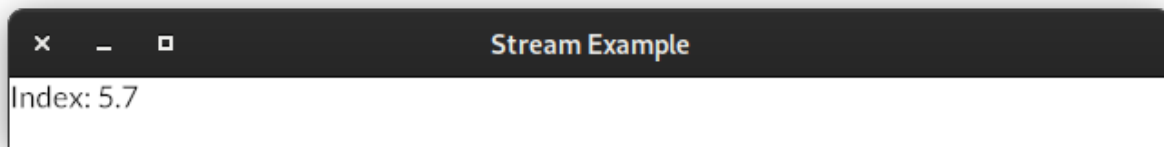
        return ('Font', Font(FONT_NAME, data))

if __name__ == '__main__':
    AsyncMessageExample().run()

```

4.1.4 AsyncGenerator Generating Messages

An application can *subscribe* to *AsyncGenerators* to receive *Messages* about asynchronously generated information, e.g. a pending web download.



```

from asyncio import sleep

from pylced import column, IcedApp, stream, text

class StreamExample(IcedApp):
    def __init__(self):
        self.__stream = stream(self.__generator_func())
        self.__index = 0

        class settings:
            class window:
                size = (640, 40)

    def title(self):
        return 'Stream Example'

    def view(self):
        return column([text(f'Index: {self.__index / 10:.1f}')]])

    def subscriptions(self):
        if self.__stream is not None:
            return [self.__stream]

    def update(self, msg, clipboard):
        match msg:
            case 'done':
                self.__stream = None
            case int(index):

```

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```

        self.__index = index

    async def __generator_func(self):
        for i in range(1, 101):
            yield i
            await sleep(0.1)
        yield 'done'

if __name__ == '__main__':
    StreamExample().run()

```

4.1.5 Capturing Keystrokes

To capture any keystroke (or indeed any event that originates from user interaction), you can make `pyiced.IcedApp.subscriptions()` return a list [`pyiced.Subscription.UNCAPTURED`].

```

from pyiced import (
    Align, container, Message, IcedApp, Length, Settings, Subscription,
    text, WindowSettings,
)

class FullscreenExample(IcedApp):
    def __init__(self):
        self.__fullscreen = False
        self.__should_exit = False

    class settings(Settings):
        class window(WindowSettings):
            size = (640, 320)

    def subscriptions(self):
        return [Subscription.UNCAPTURED]

    def fullscreen(self):
        return self.__fullscreen

    def should_exit(self):
        return self.__should_exit

    def title(self):
        return self.__message

    def update(self, msg, clipboard):
        match msg:
            case Message(keyboard='keyreleased', key_code='F11'):
                self.__fullscreen = not self.__fullscreen
            case Message(keyboard='keyreleased', key_code='Escape'):
                self.__should_exit = True

```

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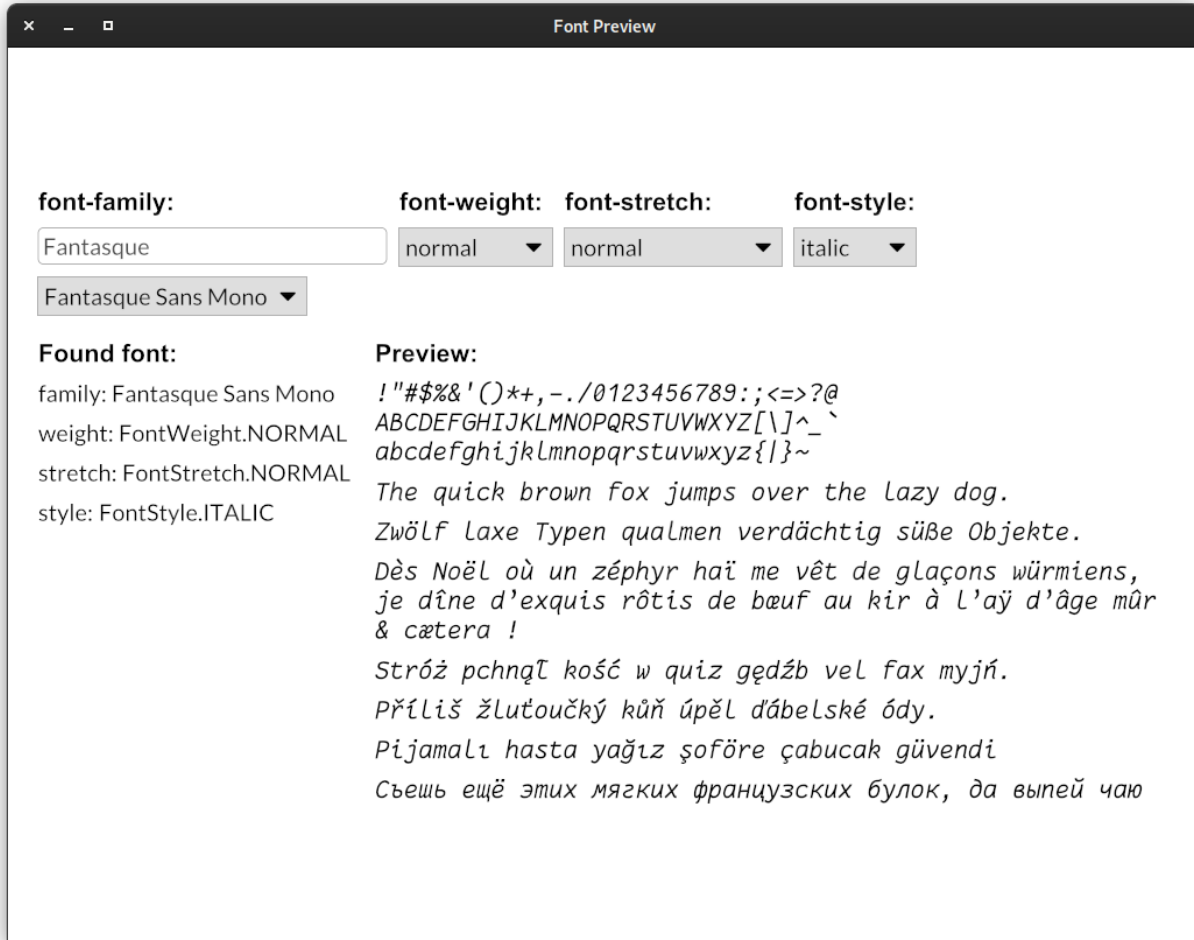
```
def view(self):
    return container(
        text(self.__message, size=40),
        padding=20, align_x=Align.CENTER, align_y=Align.CENTER,
        width=Length.FILL, height=Length.FILL,
    )

@property
def __message(self):
    if self.__fullscreen:
        return 'Fullscreen (press F11!)'
    else:
        return 'Windowed (press F11!)'

if __name__ == '__main__':
    FullscreenExample().run()
```

4.1.6 Using System Fonts

You can load use `findfont()` to find and load system fonts. This example gives you a preview of the installed fonts.



```

from bisect import bisect_left, bisect_right

from pylced import (
    Align, column, container, findfont, IcedApp, Length, PickListState,
    pick_list, row, Settings, systemfonts, text, text_input,
    TextInputState,
)

class FontPreview(IcedApp):
    class settings(Settings):
        default_text_size = 24

    def __init__(self):
        self.__font_bold = findfont(
            ['Arial', 'Noto Sans', 'DejaVu Sans', 'sans-serif'],
            weight='bold',
        ).load()

        self.__family_prefix_state = TextInputState()
        self.__family_prefix = ''

```

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```

self.__family_state = PickListState()
self.__family = ''
self.__families = sorted(
    {fontid.family for fontid in systemfonts()} |
    {'serif', 'sans-serif', 'cursive', 'fantasy', 'monospace'}
)

self.__weight = 'normal'
self.__weight_state = PickListState()

self.__stretch = 'normal'
self.__stretch_state = PickListState()

self.__style = 'normal'
self.__style_state = PickListState()

def title(self):
    return 'Font Preview'

def view(self):
    if self.__family_prefix:
        def family_key(s):
            return cmp(s[:len(family_prefix)].lower(), family_prefix)

        family_prefix = self.__family_prefix.lower()
        families_start = bisect_left(
            self.__families, 0,
            key=family_key,
        )
        families_end = bisect_right(
            self.__families, 0, families_start,
            key=family_key,
        )
        families = self.__families[families_start:families_end][:10]
    else:
        families = None
    family = column(
        [
            text('font-family:', font=self.__font_bold),
            text_input(
                'family_prefix',
                self.__family_prefix_state,
                '',
                self.__family_prefix,
                padding=4,
            ),
        ],
        pick_list(
            'family',
            self.__family_state,
            self.__family,
            families or [
                'serif', 'sans-serif', 'cursive', 'fantasy',

```

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```

        'monospace',
    ],
),
],
max_width=300,
spacing=10,
)
weight = column(
    [
        text('font-weight:', font=self.__font_bold),
        pick_list(
            'weight',
            self.__weight_state,
            self.__weight,
            [
                'thin', 'extra-light', 'light', 'normal',
                'medium', 'semibold', 'bold', 'extra-bold',
                'black',
            ],
        ),
    ],
    max_width=300,
    spacing=10,
)
stretch = column(
    [
        text('font-stretch:', font=self.__font_bold),
        pick_list(
            'stretch',
            self.__stretch_state,
            self.__stretch,
            [
                'ultra-condensed', 'extra-condensed', 'condensed',
                'semi-condensed', 'normal', 'semi-expanded',
                'expanded', 'extra-expanded', 'ultra-expanded',
            ],
        ),
    ],
    max_width=300,
    spacing=10,
)
style = column(
    [
        text('font-style:', font=self.__font_bold),
        pick_list(
            'style',
            self.__style_state,
            self.__style,
            ['normal', 'italic', 'oblique'],
        ),
    ],
    max_width=300,

```

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```

        spacing=10,
    )
    search = row([family, weight, stretch, style], spacing=10)

    font = findfont(
        self.__family, self.__weight, self.__stretch, self.__style,
    )
    font_data = column(
        [
            text(
                'Found font:',
                font=self.__font_bold,
            ),
            row(
                [text('family:'), text(font.family)],
                spacing=4,
            ),
            row(
                [text('weight:'), text(repr(font.weight))],
                spacing=4,
            ),
            row(
                [text('stretch:'), text(repr(font.stretch))],
                spacing=4,
            ),
            row(
                [text('style:'), text(repr(font.style))],
                spacing=4,
            ),
        ],
        spacing=10,
    )

    font = font.load()
    font_preview = column(
        [
            text(
                'Preview:',
                font=self.__font_bold,
            ),
            text(
                '!"#$%&\'()*+,-./0123456789:;<=>?@'
                ' ABCDEFGHIJKLMNOPQRSTUVWXYZ[\\]^_`'
                ' abcdefghijklmnopqrstuvwxyz{|}~',
                font=font,
            ),
            text(
                'The quick brown fox jumps over the lazy dog.',
                font=font,
            ),
            text(
                'Zwölf laxe Typen qualmen verdächtig süße Objekte.',

```

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```

        font=font,
    ),
    text(
        'Dès Noël où un zéphyr haï me vêt de glaçons '
        'würmiens, je dîne d'exquis rôtis de bœuf au kir '
        'à l'ay d'âge mûr & cætera !',
        font=font,
    ),
    text(
        'Stróż pchnął kość w quiz gędźb vel fax myjń.',
        font=font,
    ),
    text(
        'Přiliš žluťoučký kůň úpěl ďábelské ódy.',
        font=font,
    ),
    text(
        'Pijamalı hasta yağız şoföre çabucak güvendi',
        font=font,
    ),
    text(
        ' ',
        font=font,
    ),
],
spacing=10,
)

return container(
    column(
        [
            search,
            row(
                [
                    font_data,
                    font_preview,
                ],
                spacing=20,
            ),
        ],
        spacing=20,
    ),
    padding=20, align_x=Align.CENTER, align_y=Align.CENTER,
    width=Length.FILL, height=Length.FILL,
)

def update(self, msg, clipboard):
    match msg:
        case ('family_prefix', family_prefix):
            self.__family_prefix = family_prefix
        case ('family', family):

```

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```
        self.__family = family
    case ('weight', weight):
        self.__weight = weight
    case ('stretch', stretch):
        self.__stretch = stretch
    case ('style', style):
        self.__style = style

def cmp(a, b):
    return (a > b) - (a < b)

if __name__ == '__main__':
    FontPreview().run()
```

4.1.7 Two-player Online Chess

Our last example is two-player online chess (or one player offline ...)

It uses *subscriptions* open a TCP server / connect to a TCP server, and then await the other player's moves. It uses *commands* to tell the other player about your move.

(Please notice that this simple example does not actually know the chess rules. You can move twice, move the other player's pieces, capture your own pieces, etc.)



```

from asyncio import Future, open_connection, start_server
from contextlib import closing
from os.path import abspath, dirname, join
from traceback import print_exc

from pylced import (
    Align, ContainerStyle, button, ButtonState, ButtonStyle,
    ButtonStyleSheet, Color, column, container, HorizontalAlignment,
    IcedApp, Length, no_element, row, stream, svg, SvgHandle, text,
    tooltip, TooltipPosition, text_input, TextInputState,
)

class ChessExample(IcedApp):
    def new(self):
        # select role:
        self.__role = None
        self.__select_role_btns = [
            ButtonState(),
            ButtonState(),
            ButtonState(),

```

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```

]
self.__subscription = None

# server role:
self.__server_address = None

# client role:
self.__client_inputs = [
    TextInputState(),
    TextInputState(),
    ButtonState(),
]

# playing:
self.__writer = None
self.__pieces = [
    [
        'Chess_tile_rd.svg',
        'Chess_tile_nd.svg',
        'Chess_tile_bd.svg',
        'Chess_tile_qd.svg',
        'Chess_tile_kd.svg',
        'Chess_tile_bd.svg',
        'Chess_tile_nd.svg',
        'Chess_tile_rd.svg',
    ],
    ['Chess_tile_pd.svg'] * 8,
    *([None] * 8 for _ in range(4)),
    ['Chess_tile_pl.svg'] * 8,
    [
        'Chess_tile_rl.svg',
        'Chess_tile_nl.svg',
        'Chess_tile_bl.svg',
        'Chess_tile_ql.svg',
        'Chess_tile_kl.svg',
        'Chess_tile_bl.svg',
        'Chess_tile_nl.svg',
        'Chess_tile_rl.svg',
    ],
]
self.__pieces_root = join(
    dirname(abspath(__file__)),
    'chess-pieces',
)
self.__button_states = [
    [ButtonState() for _ in range(8)] for _ in range(8)
]
self.__selected = None

def title(self):
    return 'Chess Example'

```

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```

def subscriptions(self):
    return [self.__subscription]

def view(self):
    match self.__role:
        case 'server':
            elem = self.__view_server()
        case 'client':
            elem = self.__view_client()
        case 'playing':
            elem = self.__view_playing()
        case _:
            elem = self.__view_select_role()

    return container(
        elem,
        width=Length.FILL,
        height=Length.FILL,
        align_x=Align.CENTER,
        align_y=Align.CENTER,
    )

def background_color(self):
    return Color(0.627, 0.612, 0.616)

def __view_select_role(self):
    alone_state, server_state, client_state = self.__select_role_btns
    return container(
        column(
            [
                text('Play as:'),
                button(
                    alone_state,
                    text('Alone'),
                    ('role', 'alone'),
                    padding=4,
                ),
                button(
                    server_state,
                    text('Server'),
                    ('role', 'server'),
                    padding=4,
                ),
                button(
                    client_state,
                    text('Client'),
                    ('role', 'client'),
                    padding=4,
                ),
            ],
            spacing=16,
            align_items=Align.CENTER,

```

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```

        ),
        style=ContainerStyle(background=Color.WHITE),
        padding=32,
    )

def __view_server(self):
    if not self.__server_address:
        return text('Opening server ...')

    host, port = self.__server_address
    return container(
        column(
            [
                text('Waiting for client:'),
                text(f'Your IP: {host}'),
                text(f'Your port: {port}'),
            ],
            spacing=16,
            align_items=Align.CENTER,
        ),
        style=ContainerStyle(background=Color.WHITE),
        padding=32,
    )

def __view_client(self):
    if not self.__server_address:
        return text('Connecting to server ...')

    return container(
        column(
            [
                text('Connect to server:'),
                row(
                    [
                        text_input(
                            'host',
                            self.__client_inputs[0],
                            'Host / IP address',
                            self.__server_address[0],
                            padding=4,
                            width=Length.units(148),
                        ),
                        text_input(
                            'port',
                            self.__client_inputs[1],
                            'Port',
                            self.__server_address[1],
                            padding=4,
                            width=Length.units(148),
                        ),
                    ],
                    spacing=16,
                ),
            ],
            spacing=16,
        )
    )

```

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```

        ),
        button(
            self.__client_inputs[2],
            text(
                'Connect',
                horizontal_alignment=HorizontalAlignment.CENTER,
            ),
            ('client', self.__server_address),
            padding=16,
            width=Length.units(328),
        ),
    ],
    spacing=16,
    align_items=Align.CENTER,
),
style=ContainerStyle(background=Color.WHITE),
padding=32,
)

def __view_playing(self):
    return row(
        [
            column(
                [self.__cell_at(x, y) for y in range(8)],
                width=Length.fill_portion(1),
                height=Length.FILL,
            )
            for x in range(8)
        ],
        width=Length.units(8 * 80),
        height=Length.units(8 * 80),
    )

def __cell_at(self, x, y):
    piece = self.__pieces[y][x]
    if piece:
        elem = svg(
            SvgHandle.from_path(join(self.__pieces_root, piece)),
        )
    else:
        elem = no_element()

    style = ButtonStyle(
        background=(
            Color(0.200, 0.600, 0.800)
            if self.__selected == (x, y) else
            Color(1.000, 0.808, 0.620)
            if (x + y) & 1 else
            Color(0.820, 0.545, 0.278)
        ),
        shadow_offset=(0, 0),
    )

```

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```

return tooltip(
    button(
        self.__button_states[y][x],
        container(
            elem,
            align_x=Align.CENTER,
            align_y=Align.CENTER,
            width=Length.FILL,
            height=Length.FILL,
        ),
        ('select', x, y, True),
        width=Length.fill_portion(1),
        height=Length.fill_portion(1),
        style=ButtonStyleSheet(style, style, style, style),
    ),
    f'{chr(ord("a") + 7 - y)}{x + 1}',
    TooltipPosition.FOLLOW_CURSOR,
)

def update(self, msg, clipboard):
    match msg:
        case ('select', x, y, do_notify):
            if self.__selected == (x, y):
                # deselect
                self.__selected = None
            elif self.__selected:
                # move
                (x0, y0) = self.__selected
                self.__pieces[y][x] = self.__pieces[y0][x0]
                self.__pieces[y0][x0] = None
                self.__selected = None
            elif self.__pieces[y][x]:
                # select
                self.__selected = (x, y)

            if do_notify and self.__writer:
                async def write():
                    self.__writer.write(b'%d %d\n' % (x, y))
                    await self.__writer.drain()
                return [write()]

        case ('role', 'alone'):
            self.__role = 'playing'

        case ('role', 'server'):
            self.__role = 'server'
            self.__subscription = stream(self.__role_server())

        case ('role', 'client'):
            self.__role = 'client'
            self.__server_address = ['0.0.0.0', '']

```

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```

    case ('server', (host, port)):
        self.__server_address = host, port

    case ('client', (host, port)):
        self.__server_address = None
        self.__role = 'server'
        self.__subscription = stream(self.__role_client(host, port))

    case ('connected', (reader, writer)):
        self.__writer = writer
        self.__subscription = stream(self.__read_connection(reader))
        self.__role = 'playing'

    case ('host', value):
        self.__server_address[0] = value

    case ('port', value):
        self.__server_address[1] = value

    case ('host' | 'port', None, 'submit'):
        return [('client', self.__server_address)]

async def __read_connection(self, reader):
    while not reader.at_eof():
        line = await reader.readline()
        if not line:
            break
        x, y = line.split()
        yield 'select', int(x), int(y), False

async def __role_client(self, host, port):
    try:
        yield 'connected', await open_connection(host, port)
    except Exception:
        print_exc()
        yield 'role', 'client'

async def __role_server(self):
    query = (
        b'GET / HTTP/1.0\r\n'
        b'Host: whatismyip.akamai.com\r\n'
        b'Connection: closed\r\n'
        b'\r\n'
    )
    reader, writer = await open_connection('whatismyip.akamai.com', 80)
    with closing(writer):
        writer.write(query)
        await writer.drain()
        while (await reader.readline()) != b'\r\n':
            continue
        hostname = (await reader.read()).decode('US-ASCII').strip()
        await writer.wait_closed()

```

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```

client = Future()
server = await start_server(
    lambda reader, writer: client.set_result((reader, writer)),
    '0.0.0.0',
    0,
)
port = next(iter(server.sockets)).getsockname()[1]
yield 'server', (hostname, port)
yield 'connected', await client

if __name__ == '__main__':
    ChessExample().run()

```

4.2 Programming an IcedApp

4.2.1 Overview

<i>IcedApp()</i>	An interactive application.
<i>Element</i>	A displayable widget that can be used in <i>view()</i> .
<i>Message</i>	A message generated through user interaction.
<i>Settings()</i>	(Immutable) settings of the <i>IcedApp</i> application.
<i>WindowSettings()</i>	(Immutable) settings of the <i>IcedApp</i> window.

4.2.2 Details

class pyiced.IcedApp

An interactive application.

An application can execute asynchronous actions by returning *Commands* in some of its methods. A debug view can be toggled by pressing F12.

background_color()

Returns the background color of the application. Defaults to white.

Return type *Optional[Color]*

fullscreen()

True if the program should run in fullscreen mode.

The runtime will automatically transition your application if a new mode is returned.

Return type *bool*

new()

Initialize the application.

You can return *Commands* if you need to perform some async action in the background on startup. This is useful if you want to load state from a file, perform an initial HTTP request, etc.

Return type *Optional[Iterable[Union[Awaitable[Optional[object]], object, None]]]*

run(*, run=None)

Runs the application.

This method will take control of the current thread and will NOT return unless there is an error during startup.

It should probably be that last thing you call in your main function.

Parameters **run** (Optional[Callable[[Awaitable[Any]], Union[None, Any, NoReturn]]]) – Coroutine executor. Defaults to `asyncio.run()`.

Return type `NoReturn`

scale_factor()

Returns the scale factor of the application.

It can be used to dynamically control the size of the UI at runtime (i.e. zooming).

For instance, a scale factor of 2.0 will make widgets twice as big, while a scale factor of 0.5 will shrink them to half their size.

Return type `float`

settings: `pyiced.Settings` = <pyiced.Settings object>

The initial settings of the program.

Only queried once.

should_exit()

Returns whether the application should be terminated.

This will kill the Python instance, too.

Return type `bool`

subscriptions()

Returns the event *subscriptions* for the current state of the application.

A subscription will be kept alive as long as you keep returning it, and the messages produced will be handled by update.

Return type `Optional[Iterable[Optional[Subscription]]]`

title()

The current title of the application.

This title can be dynamic! The runtime will automatically update the title of your application when necessary.

Return type `str`

update(msg, clipboard)

Handles a message and updates the state of the application.

This is where you define your update logic. All the messages, produced by either user interactions or commands, will be handled by this method. The method call must be executed quite fast. Long running tasks should be executed asynchronously.

Any *Command* returned will be executed immediately in the background.

Parameters

- **msg** (Union[*Message* / *object*]) – A message to handle. Generated either through user interaction, or through an (asynchronous) *pyiced.Command*.

- **clipboard** ([Clipboard](#)) – The OS’s inter-application message buffer. Can only be interacted with during this call to `update()`. Accessing it later or in another thread may crash the application.

Returns The update invocation may return a list of coroutines for asynchronous message handling, e.g. to open a socket.

Return type Optional[Commands]

abstract view()

Returns the *widget* to display in the application.

These widgets can produce messages based on user interaction.

Return type *Element*

class pyiced.Element

A displayable widget that can be used in `view()`.

class pyiced.Message

A message generated through user interaction.

Messages get passed to to `update()`.

alt

The alt key was pressed / released.

Returns

- *True* – Yes, the alt key was pressed or released.
- *False* – No, the state of the alt key is unchanged.
- *None* – Not a “keypress”, “keyrelease” or “modifierschanged” event.

Return type Optional[bool]

amount

The scroll movement.

Returns

The horizontal and vertical amount. The unit can be determined by inspecting *wheelscrolled*.

None if not a scroll movement.

Return type Optional[Tuple[float, float]]

button

The button of a mouse event.

Returns

- “left” – The left mouse button.
- “right” – The right mouse button.
- “middle” – The middle (wheel) button.
- *int* – Another button.
- *None* – Not a mouse event.

Return type Union[str|int|None]

characterreceived

A unicode character was received.

Returns The received, composed character. *None* if not a character event.

Return type Optional[str]

control

The control key was pressed / released.

Returns

- *True* – Yes, the control key was pressed or released.
- *False* – No, the state of the control key is unchanged.
- *None* – Not a “keypress”, “keyrelease” or “modifierschanged” event.

Return type Optional[bool]

cursormoved

The mouse cursor was moved.

Returns Horizontal and vertical pixels, or *None* if cursor was not moved.

Return type Optional[Tuple[float, float]]

file

The path of the hovering or dropped file.

Returns The path or none, if the Message is not a file action.

Return type Optional[pathlib.Path]

finger

A unique identifier representing a finger on a touch interaction.

Returns Identifier of the finger.

Return type int

key_code

The name of the pressed or released key.

See `iced_native::keyboard::KeyCode` for the name of the keys.

Returns The name of the key, or *None* if the not a key press or release.

Return type Optional[str]

keyboard

The kind of the keyboard interaction.

Returns

- *None* if not a `Message(native="keyboard")` interaction
- “keypressed” when a key was pushed down
- “keyreleased” when a key no more pushed down
- “characterreceived” when a key press + release generated a character
- “modifierschanged” when a modifier was pressed or released, e.g. shift

Return type Optional[str]

kind

The kind of the native message.

Returns

- *"mouse"* for mouse interactions, e.g. mouse clicking
- *"window"* for window interactions, e.g. resizing
- *"keyboard"* for keyboard interactions, e.g. key presses
- *"touch"* for touch interactions (impossible?)

Return type `str`

logo

The "logo" key was pressed / released.

The logo key is the windows key, command key, etc.

Returns

- *True* – Yes, the "logo" key was pressed or released.
- *False* – No, the state of the "logo" key is unchanged.
- *None* – Not a *"keypress"*, *"keyrelease"* or *"modifierschanged"* event.

Return type Optional[`bool`]

mouse

A mouse event.

Returns

- *"cursorentered"* – The mouse cursor entered the window.
- *"cursorleft"* – The mouse cursor left the window.
- *"cursormoved"* – The mouse cursor was moved
- *"buttonpressed"* – A mouse button was pressed.
- *"buttonreleased"* – A mouse button was released.
- *"wheelscrolled"* – The mouse wheel was scrolled.
- *None* – Not a mouse event.

Return type Optional[`str`]

position

A 2D point for the touch interaction.

Returns A 2D point

Return type Tuple[`float`, `float`]

resized

The new size of the window.

Returns The width and height in pixels or null, if it's not a resize action.

Return type Optional[tuple(int, int)]

shift

The shift key was pressed / released.

Returns

- *True* – Yes, the shift key was pressed or released.
- *False* – No, the state of the shift key is unchanged.
- *None* – Not a “keypress”, “keyrelease” or “modifierschanged” event.

Return type Optional[bool]

touch

A touch interaction.

Returns

- “*fingerpressed*” – A touch interaction was started.
- “*fingermoved*” – An on-going touch interaction was moved.
- “*fingerlifted*” – A touch interaction was ended.
- “*fingerlost*” – A touch interaction was canceled.
- *None* – Not a touch interaction.

Return type Optional[str]

wheelscrolled

The unit of the scroll movement.

Returns

- “*lines*” – Counting in lines / columns.
- “*pixels*” – Counting in pixels.
- *None* – Not a scroll movement.

Return type Optional[str]

window

The kind of the window message.

Returns

- “*resized*” – The window was resized.
- “*closerequested*” – The window close button was clicked.
- “*focused*” – The window was focus.
- “*unfocused*” – The focus left the window.
- “*filehovered*” – A file is hovering the window. A selection of multiple files cause multiple messages.
- “*filedropped*” – A file was dropped on the window. A selection of multiple files cause multiple messages.
- “*fileshoveredleft*” – The cursor the with hovering file(s) left the window.
- *None* – Not a window message.

Return type Optional[str]

class pyiced.Settings

(Immutable) settings of the *IcedApp* application.

antialiasing: `bool = True`

If set to true, the renderer will try to perform antialiasing for some primitives.

Enabling it can produce a smoother result in some widgets, like the Canvas, at a performance cost.

default_font: `pyiced.Font = Font.DEFAULT`

The font that will be used by default.

If *None* or *Font.DEFAULT* is provided, a default system font will be chosen.

default_text_size: `int = 20`

The text size that will be used by default.

exit_on_close_request: `bool = True`

Whether the *IcedApp* should exit when the user requests the window to close (e.g. the user presses the close button).

window: `pyiced.WindowSettings = <pyiced.WindowSettings object>`

The window settings.

class pyiced.WindowSettings

(Immutable) settings of the *IcedApp* window.

always_on_top: `bool = False`

Whether the window will always be on top of other windows.

decorations: `bool = True`

Whether the window should have a border, a title bar, etc. or not.

icon: `Optional[pyiced.Icon] = <pyiced.Icon object>`

TODO

max_size: `Optional[Tuple[int, int]] = None`

The maximum size of the window.

min_size: `Optional[Tuple[int, int]] = None`

The minimum size of the window.

resizable: `bool = True`

Whether the window should be resizable or not.

size: `Tuple[int, int] = (1024, 768)`

Initial dimensions of the newly crated window.

transparent: `bool = False`

Whether the window should be transparent.

4.2.3 Type aliases

`pyiced.Command`

alias of `Union[Awaitable[Optional[object]], object]`

`pyiced.Commands`

alias of `Iterable[Optional[Union[Awaitable[Optional[object]], object]]]`

4.3 Displayable Elements

4.3.1 Overview

<code>button(state, content[, on_press, width, ...])</code>	A generic widget that produces a message when pressed.
<code>checkbox(token, is_checked, label, *[, ...])</code>	A box that can be checked.
<code>column(children, *[, spacing, padding, ...])</code>	A container that distributes its contents vertically.
<code>container(content, *[, padding, width, ...])</code>	An element decorating some content.
<code>image(handle, *[, width, height])</code>	A frame that displays an image while keeping aspect ratio.
<code>no_element()</code>	A <code>space()</code> with minimum width and height.
<code>pick_list(token, state, selected, options, *)</code>	A widget for selecting a single value from a list of options.
<code>progress_bar(start, end, value, *[, width, ...])</code>	A bar that displays progress.
<code>radio(token, selected, value, label, *[, ...])</code>	A circular button representing a choice.
<code>row(children, *[, spacing, padding, width, ...])</code>	A container that distributes its contents horizontally.
<code>rule(*[, horizontal, vertical, style])</code>	Display a horizontal or vertical rule for dividing content.
<code>scrollable(state, children, *[, spacing, ...])</code>	A widget that can vertically display an infinite amount of content with a scrollbar.
<code>slider(token, state, start, end, value[, ...])</code>	An horizontal bar and a handle that selects a single value from a range of values.
<code>space(*[, width, height])</code>	An amount of empty space.
<code>svg(handle, *[, width, height])</code>	A vector graphics image.
<code>text(label, *[, size, color, font, width, ...])</code>	A paragraph of text.
<code>text_input(token, state, placeholder, value, *)</code>	A field that can be filled with text.
<code>tooltip(content, tooltip, position, *[, ...])</code>	Make a tooltip.

4.3.2 Details

`pyiced.button(state, content, on_press=None, *, width=None, height=None, min_width=None, min_height=None, padding=None, style=None)`

A generic widget that produces a message when pressed.

Parameters

- **state** (`ButtonState`) – Current state of the button. The same object must be given between calls.
- **content** (`Element`) – The element displayed inside the button, e.g. a `text()`.
- **on_press** (`Optional[object]`) – Message to send to the app's `update()` loop when the key was clicked. Without this argument the button won't be clickable.

- **width** (*Optional*[*Length*]) – Width the the button.
- **height** (*Optional*[*Length*]) – Height the the button.
- **min_width** (*Optional*[*int*]) – Minimum width of the button in pixels.
- **min_height** (*Optional*[*int*]) – Minimum height of the button in pixels.
- **padding** (*Optional*[*int*]) – Amount of pixels surrounding the contained element.
- **style** (*Optional*[*ButtonStyleSheet*]) – The style of the button.

Returns The newly created button.

Return type *Element*

Example



```
from pylced import (
    Align, button, ButtonState, ButtonStyle, ButtonStyleSheet, Color,
    container, ContainerStyle, IcedApp, Length, Settings, text,
    WindowSettings,
)

class ButtonExample(IcedApp):
    class settings(Settings):
        class window(WindowSettings):
            size = (640, 320)

    def __init__(self):
        self.__button_state = ButtonState()
```

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```
def title(self):
    return 'A Button'

def view(self):
    styled_button = button(
        self.__button_state,
        text('Hello, world!', size=40),
        '',
        style=ButtonStyleSheet(ButtonStyle(
            shadow_offset=(8, 8), border_radius=40, border_width=6,
            background=Color(0.17, 0.17, 0.17),
            border_color=Color(0.95, 0.87, 0.22),
            text_color=Color(1.00, 0.18, 0.13)
        )),
        padding=40,
    )
    return container(
        styled_button,
        style=ContainerStyle(background=Color(0.38, 0.60, 0.23)),
        padding=20, align_x=Align.CENTER, align_y=Align.CENTER,
        width=Length.FILL, height=Length.FILL,
    )

if __name__ == '__main__':
    ButtonExample().run()
```

See also:

`iced_native::widget::button::Button`

`pyiced.checkbox(token, is_checked, label, *, size=None, width=None, spacing=None, text_size=None, font=None, style=None)`

A box that can be checked.

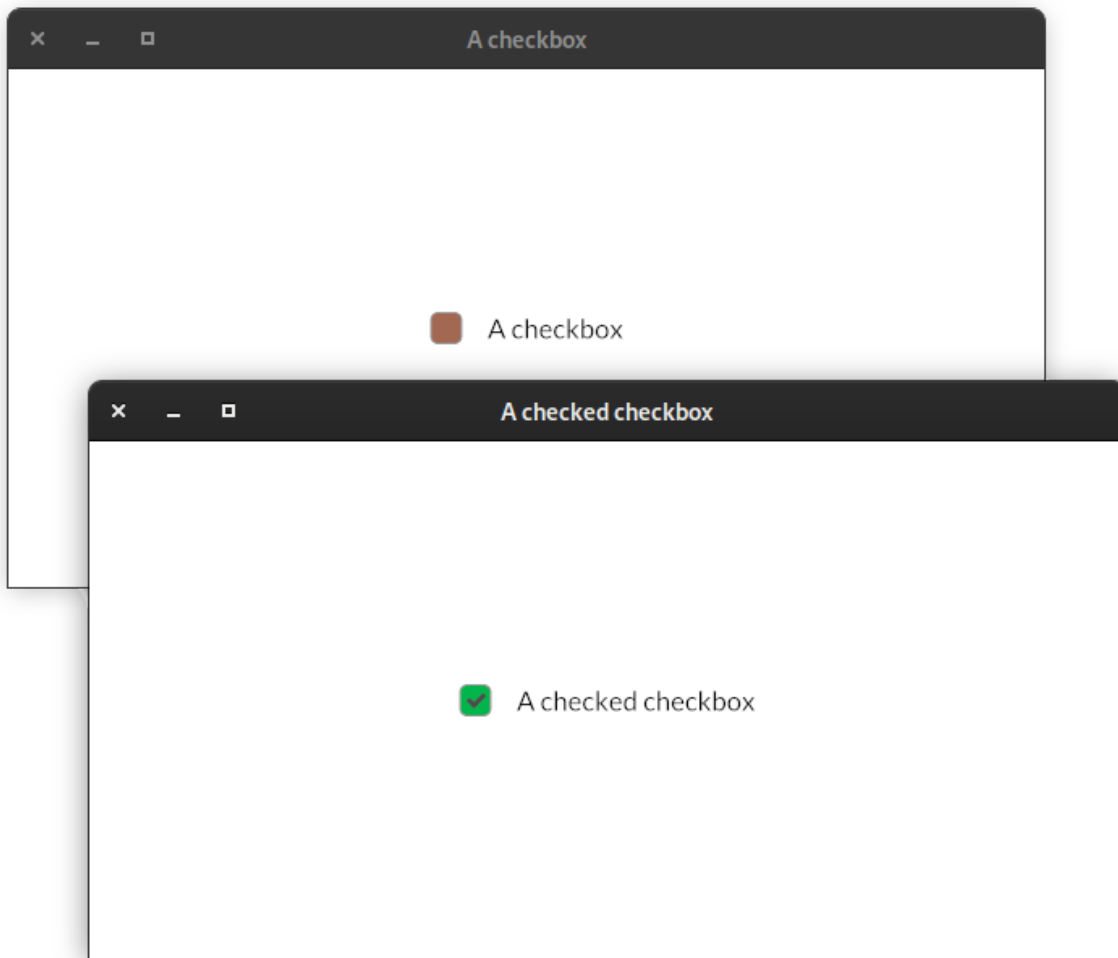
Parameters

- **token** (*object*) – When the user changes the text, a message (`token`, `new_is_checked`) is sent to the app's `update()` method.
- **is_checked** (*bool*) – Whether the checkbox is currently checked or not.
- **label** (*str*) – A text besides the checkbox. Might be empty.
- **size** (*Optional[int]*) – Size of the checkbox.
- **width** (*Optional[Length]*) – Width of the widget (checkbox and text).
- **spacing** (*Optional[int]*) – Space between checkbox and text.
- **text_size** (*Optional[int]*) – Font size of the text.
- **font** (*Optional[Font]*) – Font of the text.
- **style** (*Optional[CheckboxStyleSheet]*) – Style of the checkbox.

Returns Newly created checkbox.

Return type *Element*

Example



```
from pylced import (
    Align, checkbox, CheckboxStyle, CheckboxStyleSheet, Color,
    container, IcedApp, Length, Settings, WindowSettings,
)

class CheckboxExample(IcedApp):
    class settings(Settings):
        class window(WindowSettings):
            size = (640, 320)

    def __init__(self):
        self.__is_checked = False

    def title(self):
        if self.__is_checked:
            return 'A checked checkbox'
        else:
```

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```

        return 'A checkbox'

    def view(self):
        styled_checkbox = checkbox(
            'set',
            self.__is_checked,
            self.title(),
            style=CheckboxStyleSheet(
                active=CheckboxStyle(
                    'active',
                    background=Color(0.64, 0.41, 0.32),
                ),
                active_checked=CheckboxStyle(
                    'active_checked',
                    background=Color(0, 0.71, 0.296),
                ),
            ),
        )
        return container(
            styled_checkbox,
            padding=20, align_x=Align.CENTER, align_y=Align.CENTER,
            width=Length.FILL, height=Length.FILL,
        )

    def update(self, msg, clipboard):
        match msg:
            case 'set', is_checked:
                self.__is_checked = is_checked

if __name__ == '__main__':
    CheckboxExample().run()

```

See also:

`iced_native::widget::checkbox::Checkbox`

`pyiced.column(children, *, spacing=None, padding=None, width=None, height=None, max_width=None, max_height=None, align_items=None)`

A container that distributes its contents vertically.

Parameters

- **children** (*Iterable*[*Optional*[*Element*]]) – Create the column with the given elements.
- **spacing** (*Optional*[*int*]) – Vertical spacing between elements.
- **padding** (*Optional*[*int*]) – Padding of the column.
- **width** (*Optional*[*Length*]) – Width of the column.
- **height** (*Optional*[*Length*]) – Height of the column.
- **max_width** (*Optional*[*int*]) – Maximum width of the column.
- **max_height** (*Optional*[*int*]) – Maximum height of the column in pixels.

- **align_items** (*Optional* [[Align](#)]) – Horizontal alignment of the contents of the column.

Returns The newly created column.

Return type [Element](#)

Example



```
from pylced import column, IcedApp, Settings, text, WindowSettings

class ColumnExample(IcedApp):
    class settings(Settings):
        class window(WindowSettings):
            size = (640, 320)

    def title(self):
        return 'A Column'

    def view(self):
        return column(
            [text('Hello,'), text('world!')],
            padding=80, spacing=120,
        )

if __name__ == '__main__':
    ColumnExample().run()
```

See also:

[iced_native::widget::column::Column](#)

```
pyiced.container(content, *, padding=None, width=None, height=None, max_width=None, max_height=None,
                 align_x=None, align_y=None, style=None)
```

An element decorating some content.

It is normally used for alignment purposes.

Parameters

- **content** ([Element](#)) – The content of the container.
- **padding** (*Optional*[[int](#)]) – The padding around the content.
- **width** (*Optional*[[Length](#)]) – The width of the container.
- **height** (*Optional*[[Length](#)]) – The height of the container.
- **max_width** (*Optional*[[int](#)]) – The maximum width of the container
- **max_height** (*Optional*[[int](#)]) – The maximum height of the container.
- **align_x** (*Optional*[[Length](#)]) – The horizontal alignment of the content inside the container.
- **align_y** (*Optional*[[Length](#)]) – The vertical alignment of the content inside the container.
- **style** (*Optional*[[ContainerStyleSheet](#)]) – The style of the container.

Returns The newly created .

Return type [Element](#)

See also:

[iced_native::widget::container::Container](#)

```
pyiced.image(handle, *, width=None, height=None)
```

A frame that displays an image while keeping aspect ratio.

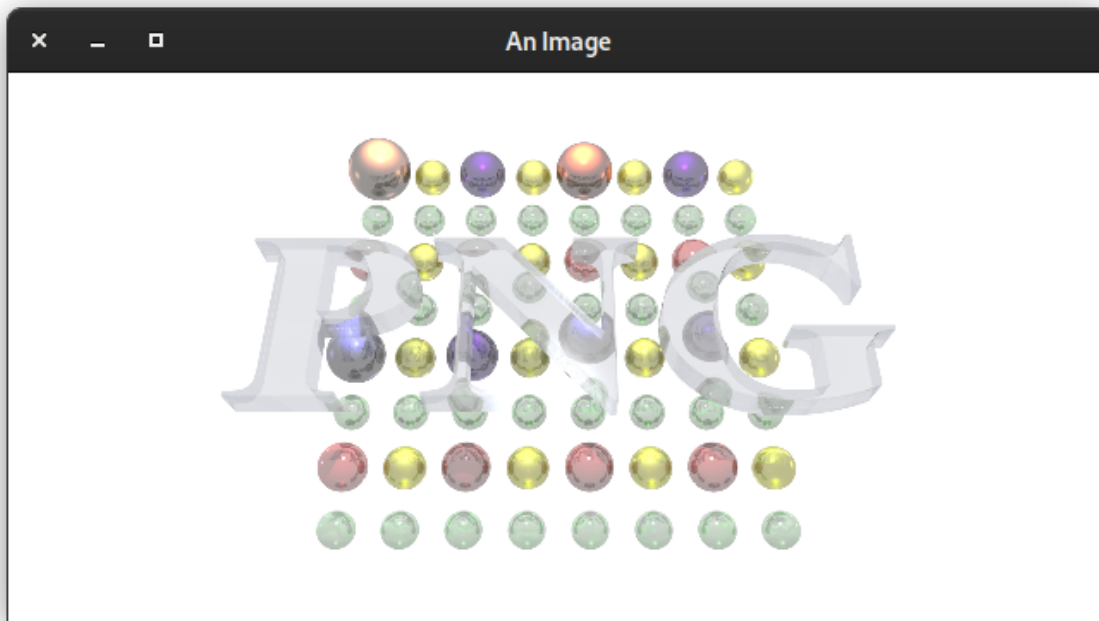
Parameters

- **handle** ([ImageHandle](#)) – The handle of the image.
- **width** (*Optional*[[Length](#)]) – The width of the image.
- **height** (*Optional*[[Length](#)]) – The height of the image.

Returns The newly created image element.

Return type [Element](#)

Example



```

from asyncio import open_connection
from contextlib import closing

from pylced import (
    Align, container, IcedApp, image, ImageHandle, Length, Settings,
    text, WindowSettings,
)

class ImageExample(IcedApp):
    def __init__(self):
        self.__handle = None

    class settings(Settings):
        class window(WindowSettings):
            size = (640, 320)

    def title(self):
        return 'An Image'

    def new(self):
        return [load_image()]

    def update(self, msg, clipboard):
        match msg:
            case ('ImageHandle', handle):
                self.__handle = handle

```

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```

def view(self):
    if self.__handle is None:
        return text('Loading ...')

    return container(
        image(
            self.__handle,
            height=Length.units(300),
            width=Length.units(600), # the aspect ratio is preserved
        ),
        align_x=Align.CENTER, align_y=Align.CENTER,
        width=Length.FILL, height=Length.FILL,
    )

async def load_image():
    HOST = 'upload.wikimedia.org'
    PATH = '/wikipedia/de/b/bb/Png-logo.png'

    query = (
        f"GET {PATH} HTTP/1.0\r\n"
        f"Host: {HOST}\r\n"
        f"Connection: closed\r\n"
        f"User-Agent: Mozilla/1.22 (compatible; MSIE 2.0; Windows 95)\r\n"
        f"\r\n"
    ).encode('US-ASCII')

    reader, writer = await open_connection(HOST, 443, ssl=True)
    with closing(writer):
        writer.write(query)
        await writer.drain()
        while (await reader.readline()) != b'\r\n':
            continue

        data = await reader.read()
    await writer.wait_closed()

    return ('ImageHandle', ImageHandle.from_memory(data))

if __name__ == '__main__':
    ImageExample().run()

```

See also:`iced_native::widget::image::Image``pyiced.no_element()`A `space()` with minimum width and height.**Returns** The newly created empty space.**Return type** *Element*

`pyiced.pick_list(token, state, selected, options, *, text_size=None, font=None, style=None)`

A widget for selecting a single value from a list of options.

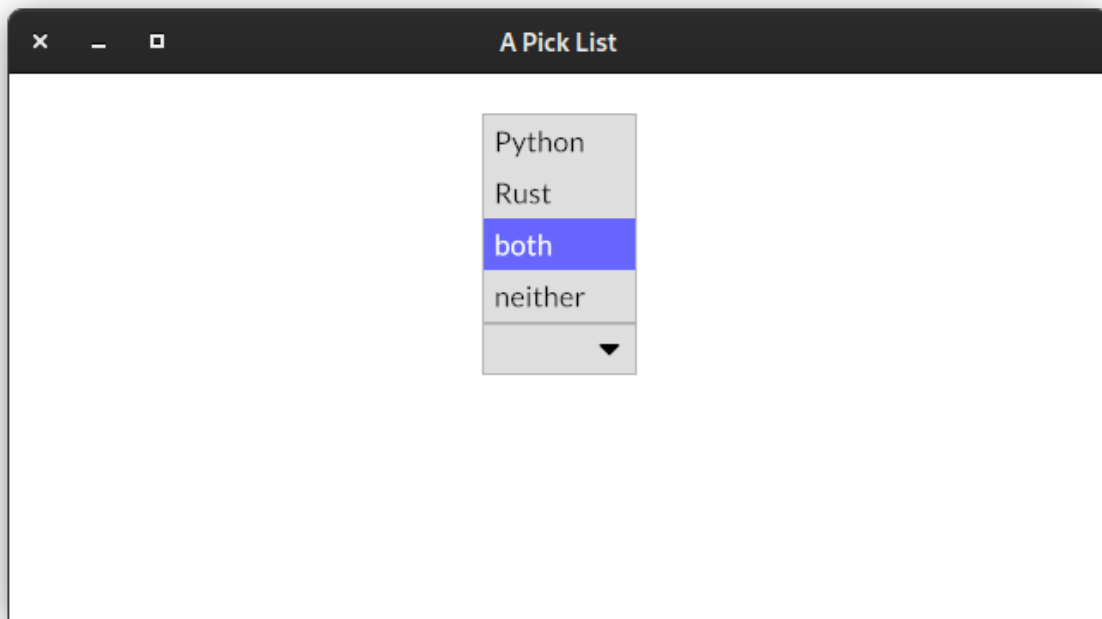
Parameters

- **token** (*object*) – When the user select a value, a message (token, new_value) is sent to the app’s `update()` method.
- **state** (`PickListState`) – Current state of the pick list. The same object must be given between calls.
- **selected** (`Optional[str]`) – The currently selected value.
- **options** (`Iterable[Optional[str]]`) – Values to select from.
- **text_size** (`Optional[int]`) – The text size of the pick list.
- **font** (`Optional[Font]`) – Font of the pick list.
- **style** (`Optional[PickListStyle]`) – Style of the pick list.

Returns The newly created pick list.

Return type *Element*

Example



```
from asyncio import sleep

from pyiced import (
    Align, container, IcedApp, Length, pick_list, PickListState,
    Settings, text, WindowSettings,
)
```

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```

class PickListExample(IcedApp):
    class settings(Settings):
        class window(WindowSettings):
            size = (640, 320)

    def __init__(self):
        self.__pick_list_state = PickListState()
        self.__selected = None
        self.__enabled = True

    def title(self):
        return 'A Pick List'

    def view(self):
        if self.__enabled:
            element = pick_list(
                'select',
                self.__pick_list_state,
                self.__selected,
                ['Python', 'Rust', 'both', 'neither'],
            )
        else:
            element = text(':-(')

        return container(
            element,
            padding=20, align_x=Align.CENTER, align_y=Align.CENTER,
            width=Length.FILL, height=Length.FILL,
        )

    def update(self, msg, clipboard):
        match msg:
            case 'select', 'neither':
                self.__enabled = False
                return [reenable()]
            case 'select', value:
                self.__selected = value
            case 'enable':
                self.__enabled = True

    async def reenable():
        await sleep(2.0)
        return 'enable'

if __name__ == '__main__':
    PickListExample().run()

```

See also:

`iced_native::widget::pick_list::PickList`

`pyiced.progress_bar(start, end, value, *, width=None, height=None, style=None)`

A bar that displays progress.

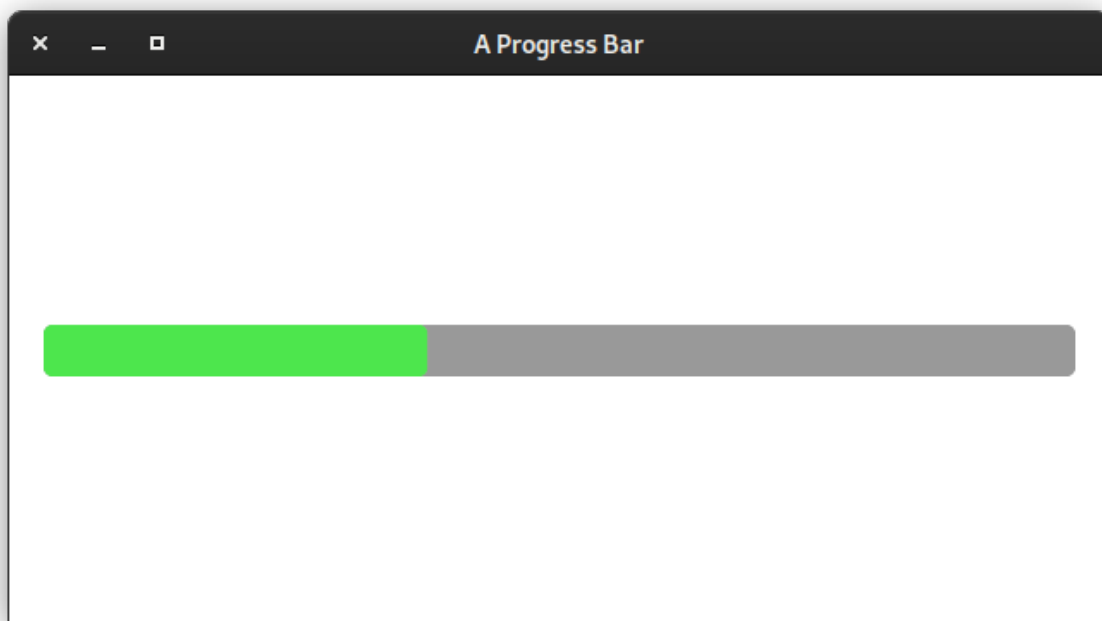
Parameters

- **start** (*float*) – Minimum value inside the value range.
- **end** (*float*) – Maximum value inside the value range.
- **value** (*float*) – Current value of the progress bar.
- **width** (*Optional[Length]*) – Width of the progress bar.
- **height** (*Optional[Length]*) – Height of the progress bar.
- **style** (*Optional[ProgressBarStyleSheet]*) – Style of the progress bar.

Returns The newly created progress bar.

Return type *Element*

Example



```
from datetime import timedelta

from pyiced import (
    Align, container, every, IcedApp, Length, progress_bar, Settings,
    WindowSettings,
)

class ProgressBarExample(IcedApp):
    class settings(Settings):
        class window(WindowSettings):
```

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```

        size = (640, 320)

    def __init__(self):
        self.__value = 0.0

    def title(self):
        return 'A Progress Bar'

    def subscriptions(self):
        if self.__value < 1:
            return [every(timedelta(milliseconds=10), 'progress')]

    def update(self, msg, clipboard):
        match msg:
            case ('progress', _):
                self.__value = (self.__value + 0.001)

    def view(self):
        return container(
            progress_bar(0, 1, self.__value),
            padding=20, align_x=Align.CENTER, align_y=Align.CENTER,
            width=Length.FILL, height=Length.FILL,
        )

if __name__ == '__main__':
    ProgressBarExample().run()

```

See also:

`iced_native::widget::progress_bar::ProgressBar`

`pyiced.radio(token, selected, value, label, *, size=None, width=None, spacing=None, text_size=None, style=None)`

A circular button representing a choice.

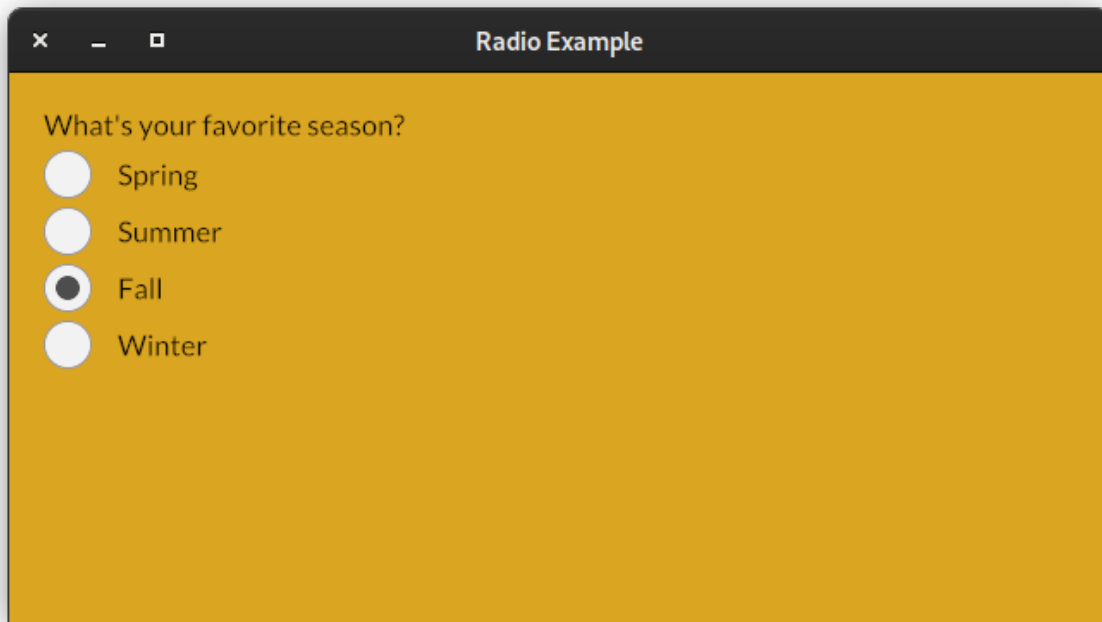
Parameters

- **token** (*object*) – When the user select this choice, a message (token, value) is sent to the app's `update()` method.
- **selected** (*Optional[int]*) – The identifier of the currently selected option.
- **value** (*int*) – Identifier of the option.
- **label** (*str*) – Label next to the radio button.
- **size** (*Optional[int]*) – The diameter of the circle.
- **width** (*Optional[Length]*) – The width including the text.
- **spacing** (*Optional[int]*) – The spacing between the radio button and its text.
- **text_size** (*Optional[int]*) – The size of the text.
- **style** (*Optional[RadioStyleSheet]*) – Style of the radio button.

Returns The newly created radio button.

Return type *Element*

Example



```
from pyiced import (
    column, css_color, IcedApp, Length, radio, Settings, text,
    WindowSettings,
)

class RadioExample(IcedApp):
    class settings(Settings):
        class window(WindowSettings):
            size = (640, 320)

    def __init__(self):
        self.__season = None

    def title(self):
        return 'Radio Example'

    def background_color(self):
        match self.__season:
            case 1:
                return css_color.MEDIUMSPRINGGREEN
            case 2:
                return css_color.LIGHTGOLDENRODYELLOW
            case 3:
                return css_color.GOLDENROD
```

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```

        case 4:
            return css_color.GHOSTWHITE

    def update(self, msg, clipboard):
        match msg:
            case 'select', value:
                self.__season = value

    def view(self):
        return column(
            [
                text("What's your favorite season?"),
                radio('select', self.__season, 1, 'Spring'),
                radio('select', self.__season, 2, 'Summer'),
                radio('select', self.__season, 3, 'Fall'),
                radio('select', self.__season, 4, 'Winter'),
            ],
            padding=20, spacing=5,
            width=Length.FILL, height=Length.FILL,
        )

if __name__ == '__main__':
    RadioExample().run()

```

See also:

`iced_native::widget::radio::Radio`

`pyiced.row(children, *, spacing=None, padding=None, width=None, height=None, max_width=None, max_height=None, align_items=None)`

A container that distributes its contents horizontally.

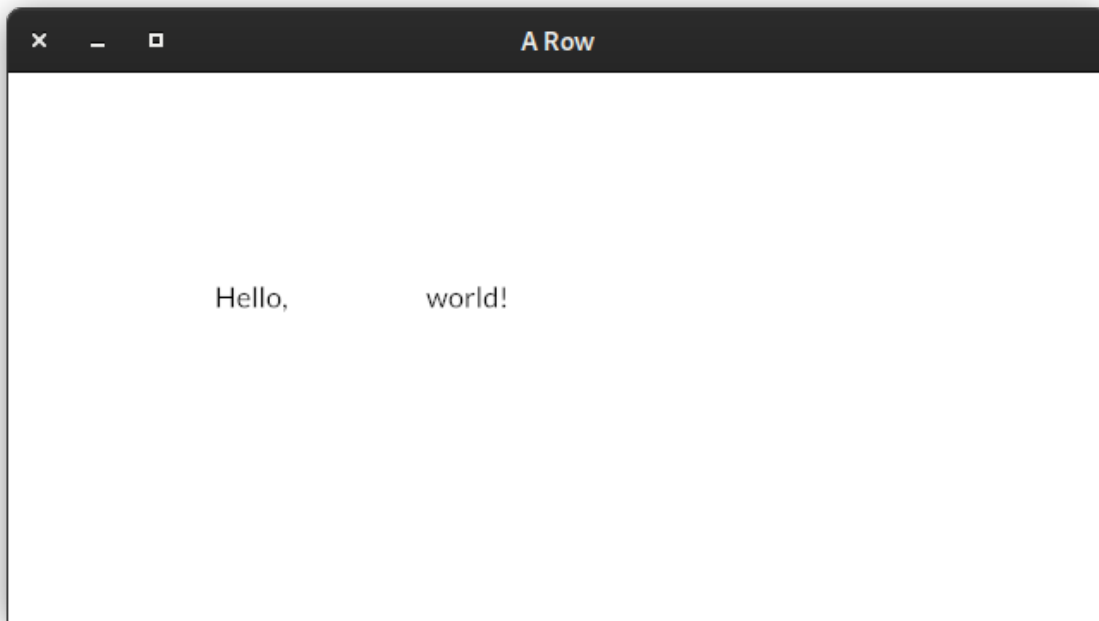
Parameters

- **children** (*Iterable*[*Optional*[[Element](#)]]) – Create the row with the given elements.
- **spacing** (*Optional*[*int*]) – Sets the horizontal spacing between elements.
- **padding** (*Optional*[*int*]) – Padding of the row.
- **width** (*Optional*[[Length](#)]) – Width of the row.
- **height** (*Optional*[[Length](#)]) – Height of the row.
- **max_width** (*Optional*[*int*]) – Maximum width of the row.
- **max_height** (*Optional*[*int*]) – Maximum height of the row.
- **align_items** (*Optional*[[Align](#)]) – Vertical alignment of the contents of the row.

Returns The newly created row.

Return type [Element](#)

Example



```
from pylced import IcedApp, row, Settings, text, WindowSettings

class RowExample(IcedApp):
    class settings(Settings):
        class window(WindowSettings):
            size = (640, 320)

    def title(self):
        return 'A Row'

    def view(self):
        return row(
            [text('Hello,'), text('world!')],
            padding=120, spacing=80,
        )

if __name__ == '__main__':
    RowExample().run()
```

See also:

`iced_native::widget::row::Row`

`pylced.rule(*, horizontal=None, vertical=None, style=None)`

Display a horizontal or vertical rule for dividing content.

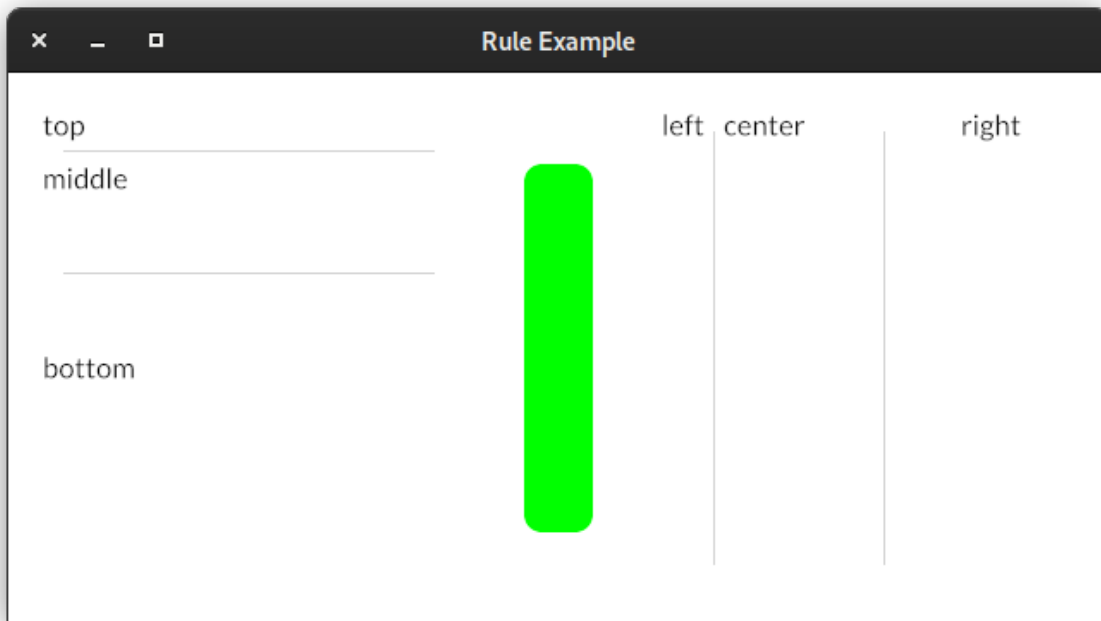
Parameters

- **horizontal** (*Optional* [*int*]) – Creates a horizontal rule for dividing content by the given vertical spacing.
- **vertical** (*Optional* [*int*]) – Creates a vertical rule for dividing content by the given horizontal spacing.
- **style** (*Optional* [*RuleStyleSheet*]) – The style of the rule.

Returns The newly created divider.

Return type *Element*

Example



```
from pylced import (
    Color, column, every, FillMode, IcedApp, Length, row, rule,
    RuleStyleSheet, Settings, text, WindowSettings,
)

class RuleExample(IcedApp):
    class settings(Settings):
        class window(WindowSettings):
            size = (640, 320)

    def new(self):
        self.__percent = 0

    def title(self):
        return 'Rule Example'
```

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```

def subscriptions(self):
    return [every(0.010, 'tick')]

def view(self):
    vertical = column(
        [
            text('top'),
            rule(horizontal=1),
            text('middle'),
            rule(horizontal=80),
            text('bottom'),
        ],
        padding=20, spacing=5,
        width=Length.FILL, height=Length.FILL,
    )
    separator = rule(
        vertical=80,
        style=RuleStyleSheet(
            color=Color(0, 1, 0),
            width=40,
            radius=10,
            fill_mode=FillMode.percent(self.__percent),
        ),
    )
    horizontal = row(
        [
            text('left'),
            rule(vertical=1),
            text('center'),
            rule(vertical=80),
            text('right'),
        ],
        padding=20, spacing=5,
        width=Length.FILL, height=Length.FILL,
    )
    return row([vertical, separator, horizontal])

def update(self, msg, clipboard):
    match msg:
        case ('tick', _):
            self.__percent = (self.__percent + 1) % 100

if __name__ == '__main__':
    RuleExample().run()

```

See also:`iced_native::widget::rule::Rule`

`pyiced.scrollable`(*state, children, *, spacing=None, padding=None, width=None, height=None, max_width=None, max_height=None, align_items=None, scrollbar_width=None, scrollbar_margin=None, scroller_width=None, style=None*)

A widget that can vertically display an infinite amount of content with a scrollbar.

Parameters

- **state** (`ScrollableState`) – Current state of the scroll container. The same object must be given between calls.
- **children** (`Iterable[Optional[Element]]`) – Elements of the scrollable `column()`.
- **spacing** (`Optional[int]`) – Vertical spacing between elements.
- **padding** (`Optional[int]`) – Padding of the Scrollable.
- **width** (`Optional[Length]`) – Width of the scrollable.
- **height** (`Optional[Length]`) – Height of the scrollable.
- **max_width** (`Optional[int]`) – Maximum width of the scrollable.
- **max_height** (`Optional[int]`) – Maximum height of the scrollable in pixels.
- **align_items** (`Optional[Align]`) – Horizontal alignment of the contents of the scrollable.
- **scrollbar_width** (`Optional[int]`) – Scrollbar width of the Scrollable. Silently enforces a minimum value of 1.
- **scrollbar_margin** (`Optional[int]`) – Scrollbar margin of the scrollable.
- **scroller_width** (`Optional[int]`) – Scroller width of the scrollable. Silently enforces a minimum value of 1.
- **style** (`Optional[ScrollableStyleSheet]`) – The style of the scrollable.

Returns The newly created scrollable widget.

Return type `Element`

Example

TODO

See also:

`iced_native::widget::scrollable::Scrollable`

`pyiced.slider(token, state, start, end, value, step=1.0, *, width=None, height=None, style=None)`

An horizontal bar and a handle that selects a single value from a range of values.

Parameters

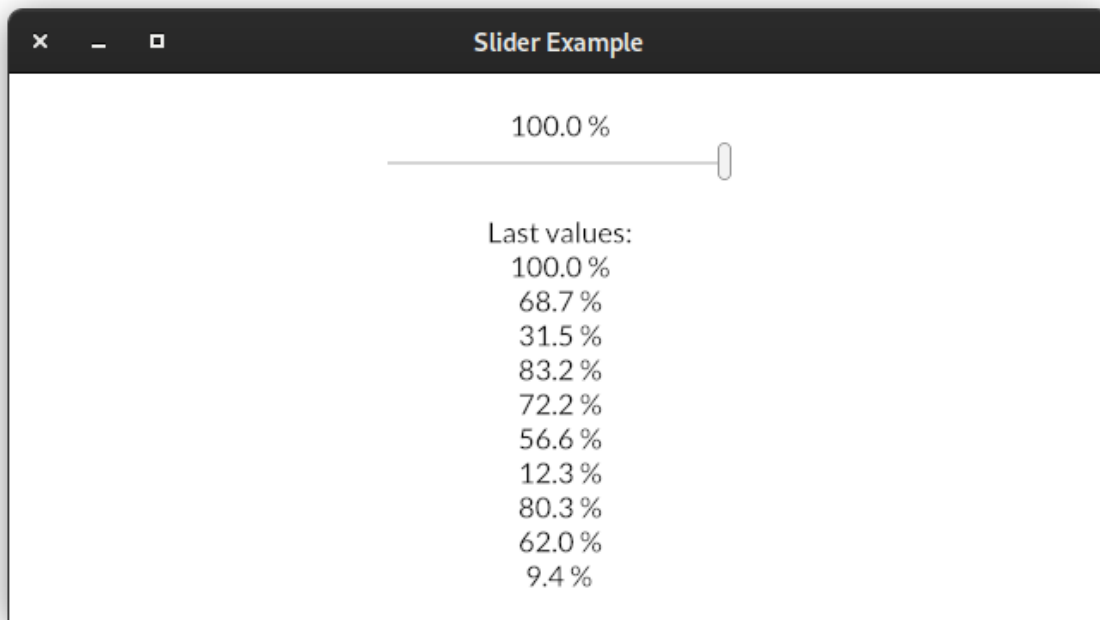
- **token** (`object`) – When the user select a value, a message (`token`, `new_value`) is sent to the app's `update()` method.
When the user releases the pressed slider (`token`, `None`, `'release'`) is sent.
- **state** (`SliderState`) – Current state of the slider. The same object must be given between calls.
- **start** (`float`) – Smallest value inside the range.
- **end** (`float`) – Biggest value inside the range.
- **value** (`float`) – Current value.
- **step** (`float`) – Step size of the slider.
- **width** (`Optional[Length]`) – Width of the slider.

- **height** (*Optional*[*int*]) – Height of the slider.
- **style** (*SliderStyleSheet*) – The normal style of the slider.

Returns The newly created slider.

Return type *Element*

Example



```
from pyiced import (
    Align, column, container, IcedApp, Length, Settings, SliderState,
    slider, text, WindowSettings,
)

class SliderApp(IcedApp):
    class settings(Settings):
        class window(WindowSettings):
            size = (640, 320)

    def __init__(self):
        self.__state = SliderState()
        self.__value = 0.5
        self.__messages = [ ' ' ] * 10

    def title(self):
        return 'Slider Example'

    def view(self):
        return container(
```

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```

column(
    [
        text(f'{self.__value * 100:.1f} %'),
        slider(
            'slider', self.__state, 0, 1, self.__value, 0.0001,
            width=Length.units(200),
        ),
        text(' '),
        text('Last values:'),
        *map(text, self.__messages),
    ],
    align_items=Align.CENTER,
),
padding=20, align_x=Align.CENTER, align_y=Align.CENTER,
width=Length.FILL, height=Length.FILL,
)

def update(self, msg, clipboard):
    match msg:
        case 'slider', value:
            self.__value = value
        case 'slider', None, 'release':
            self.__messages.pop()
            self.__messages[:0] = (f'{self.__value * 100:.1f} %',)

if __name__ == '__main__':
    SliderApp().run()

```

See also:

`iced_native::widget::slider::Slider`

`pyiced.space(*, width=None, height=None)`

An amount of empty space.

It can be useful if you want to fill some space with nothing.

Parameters

- **width** (*Optional* [`Length`]) – Creates an amount of horizontal space.
- **height** (*Optional* [`Length`]) – Creates an amount of vertical space.

Returns The newly created empty space.

Return type `Element`

See also:

`iced_native::widget::space::Space`

`pyiced.svg(handle, *, width=None, height=None)`

A vector graphics image.

An SVG image resizes smoothly without losing any quality.

SVG images can have a considerable rendering cost when resized, specially when they are complex.

Parameters

- **handle** ([SvgHandle](#)) – The handle of the image.
- **width** (*Optional*[[Length](#)]) – The width of the image.
- **height** (*Optional*[[Length](#)]) – The height of the image.

Returns The newly created SVG image.

Return type [Element](#)

Example



```
from asyncio import open_connection
from contextlib import closing

from pylced import (
    Align, container, IcedApp, Length, Settings, svg, SvgHandle, text,
    WindowSettings,
)

class SvgExample(IcedApp):
    def __init__(self):
        self.__handle = None

    class settings(Settings):
        class window(WindowSettings):
            size = (640, 320)

    def title(self):
```

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```

        return 'An SVG'

    def new(self):
        return [load_svg()]

    def update(self, msg, clipboard):
        match msg:
            case ('SvgHandle', handle):
                self.__handle = handle

    def view(self):
        if self.__handle is None:
            return text('Loading ...')

        return container(
            svg(
                self.__handle,
                height=Length.units(300), width=Length.units(300),
            ),
            align_x=Align.CENTER, align_y=Align.CENTER,
            width=Length.FILL, height=Length.FILL,
        )

async def load_svg():
    HOST = 'raw.githubusercontent.com'
    PATH = '/iced-rs/iced/master/docs/logo.svg'

    query = (
        f"GET {PATH} HTTP/1.0\r\n"
        f"Host: {HOST}\r\n"
        f"Connection: closed\r\n"
        f"User-Agent: Mozilla/1.22 (compatible; MSIE 2.0; Windows 95)\r\n"
        f"\r\n"
    ).encode('US-ASCII')

    reader, writer = await open_connection(HOST, 443, ssl=True)
    with closing(writer):
        writer.write(query)
        await writer.drain()
        while (await reader.readline()) != b'\r\n':
            continue

        data = await reader.read()
    await writer.wait_closed()

    return ('SvgHandle', SvgHandle.from_memory(data))

if __name__ == '__main__':
    SvgExample().run()

```

See also:

`iced_native::widget::svg::Svg`

`pyiced.text(label, *, size=None, color=None, font=None, width=None, height=None, horizontal_alignment=None, vertical_alignment=None)`

A paragraph of text.

Parameters

- **label** (*str*) – The text to display.
- **size** (*Optional[int]*) – The size of the text.
- **color** (*Optional[Color]*) – The color of the text.
- **font** (*Optional[Font]*) – The Font of the text.
- **width** (*Optional[Length]*) – The width of the text boundaries
- **height** (*Optional[Length]*) – The height of the text boundaries
- **horizontal_alignment** (*Optional[HorizontalAlignment]*) – The horizontal alignment of the text.
- **vertical_alignment** (*Optional[VerticalAlignment]*) – The vertical alignment of the Text

Returns The newly created text label.

Return type *Element*

See also:

`iced_native::widget::text::Text`

`pyiced.text_input(token, state, placeholder, value, *, font=None, width=None, max_width=None, padding=None, size=None, password=False, style=None)`

A field that can be filled with text.

Parameters

- **token** (*object*) – When the user changes the text, a message (`token, new_value`) is sent to the app's `update()` method.
When the user hits enter, a message (`token, None, 'submit'`) is sent.
- **state** (*TextInputState*) – Current state of the input element. The same object must be given between calls.
- **placeholder** (*str*) – Placeholder text for an element input.
- **value** (*str*) – Current value of the input element.
- **font** (*Optional[Font]*) – The font of the text.
- **width** (*Optional[Length]*) – The width of the input element.
- **max_width** (*Optional[int]*) – The maximum width of the input element.
- **padding** (*Optional[int]*) – The padding of the input element.
- **size** (*Optional[int]*) – The text size of the input element.
- **password** (*bool*) – If set to True, the input element becomes a secure password input.
- **style** (*Optional[TextInputStyleSheet]*) – Style of the text input.

Returns The newly created text input element.

Return type *Element*

See also:

`iced_native::widget::text_input::TextInput`

`pyiced.tooltip(content, tooltip, position, *, font=None, size=None, gap=None, padding=None, style=None)`

Make a tooltip.

Parameters

- **content** (*Element*) – Contained element that has a tooltip.
- **tooltip** (*str*) – Tooltip text to display.
- **position** (*TooltipPosition*) – The position of the tooltip.
- **font** (*Optional[Font]*) – The font of the tooltip.
- **size** (*Optional[int]*) – The size of the text of the tooltip.
- **gap** (*Optional[int]*) – The gap between the content and its tooltip.
- **padding** (*Optional[int]*) – TODO
- **style** (*Optional[ContainerStyleSheet]*) – The style of the tooltip.

Returns The newly created tooltip.

Return type *Element*

See also:

`iced_native::widget::tooltip::Tooltip`

4.4 State Objects

To keep the state of an *Element* across multiple invocations of `view()`, e.g. the cursor position in a `text_input()`, you have to supply a state object.

Warning: If the same state object is used for multiple elements in the same `view()` call, only the first element get displayed. All and further elements with the same state become `no_element()`.

4.4.1 Overview

<code>ButtonState()</code>	The state of a <code>button()</code> .
<code>PickListState()</code>	The state of a <code>pick_list()</code> .
<code>ScrollableState()</code>	The state of a <code>scrollable()</code> .
<code>SliderState()</code>	The state of a <code>slider()</code> .
<code>TextInputState()</code>	The state of a <code>text_input()</code> .

4.4.2 Details

class `pyiced.ButtonState`

The state of a `button()`.

class `pyiced.PickListState`

The state of a `pick_list()`.

class `pyiced.ScrollableState`

The state of a `scrollable()`.

Warning: If the state is currently in use, calling its methods will fail.

is_scroll_box_touched()

Returns whether the scroll box is currently touched or not.

Returns Yes or no

Return type `bool`

is_scroller_grabbed()

Returns whether the scroller is currently grabbed or not.

Returns Yes or no

Return type `bool`

offset(bounds, content_bounds)

The current scrolling offset of the `ScrollableState`, given the bounds of the `Scrollable` and its contents.

Parameters

- **bounds** (`Rectangle`) – TODO
- **content_bounds** (`Rectangle`) – TODO

Returns The scrolling offset.

Return type `int`

scroll(delta_y, bounds, content_bounds)

Apply a scrolling offset to the current `ScrollableState`, given the bounds of the `Scrollable` and its contents.

Parameters

- **delta_y** (`float`) – TODO
- **bounds** (`Rectangle`) – TODO
- **content_bounds** (`Rectangle`) – TODO

scroll_to(percentage, bounds, content_bounds)

Moves the scroll position to a relative amount, given the bounds of the `Scrollable` and its contents.

0.0 represents scrollbar at the top, while 1.0 represents scrollbar at the bottom.

Parameters

- **percentage** (`float`) – TODO
- **bounds** (`Rectangle`) – TODO
- **content_bounds** (`Rectangle`) – TODO

class `pyiced.SliderState`

The state of a `slider()`.

class `pyiced.TextInputState`

The state of a `text_input()`.

See also:

`iced_native::widget::text_input::State`

focus()

Focuses the `text_input()`.

Warning: If the state is currently in use, the method will fail.

is_focused()

Returns whether the `text_input()` is currently focused or not.

Warning: If the state is currently in use, the method will fail.

Returns Yes or no

Return type `bool`

move_cursor_to(position)

Moves the `TextInputCursor()` of the `TextInput` to an arbitrary location.

The result is measured in terms of graphemes, not bytes or codepoints!

See also:

`pyiced.TextInputState.state()`

Warning: If the state is currently in use, the method will fail.

Parameters `position` (`int`) – The new cursor position.

move_cursor_to_end()

Moves the `TextInputCursor()` of the `TextInput` to the end of the input text.

Warning: If the state is currently in use, the method will fail.

move_cursor_to_front()

Moves the `TextInputCursor()` of the `TextInput` to the front of the input text.

Warning: If the state is currently in use, the method will fail.

selection(*value*)

Get the selected text.

Warning: If the state is currently in use, the method will fail.

Parameters **value** (*str*) – The current value of the `text_input()`.

Returns The selected text. May be empty.

Return type *str*

state(*value*)

Get the state of the `TextInputCursor()`.

The result is measured in terms of graphemes, not bytes or codepoints!

Warning: If the state is currently in use, the method will fail.

See also:

`pyiced.TextInputState.move_cursor_to()`

Returns

- *int* – The current cursor position when there's no selection.
- *Tuple[int, int]* – The selected text range.

unfocus()

Unfocuses the `text_input()`.

Warning: If the state is currently in use, the method will fail.

4.5 Values and Enums

4.5.1 Overview

<i>Align</i>	Alignment on an axis of a container.
<i>Clipboard</i>	A buffer for short-term storage and transfer within and between applications.
<i>FillMode</i>	The fill mode of a rule.
<i>HorizontalAlignment</i>	The horizontal alignment of some resource.
<i>ImageHandle</i>	An <i>pyiced.image()</i> handle.
<i>Instant()</i>	A measurement of a monotonically nondecreasing clock.
<i>Length</i>	The strategy used to fill space in a specific dimension.
<i>Line</i> (color, width)	A line.
<i>Point</i> (x, y)	A 2D point.
<i>Rectangle</i> (top_left, size)	A rectangle.
<i>Size</i> (width, height)	An amount of space in 2 dimensions.
<i>SliderHandle</i> (proto, **kwargs)	The appearance of the handle of a slider.
<i>SliderHandleShape</i>	The shape of the handle of a slider.
<i>SvgHandle</i>	An <i>svg()</i> handle.
<i>TextInputCursor</i> (state)	A representation of cursor position in a <i>text_input()</i> .
<i>TooltipPosition</i>	The position of the tooltip.
<i>VerticalAlignment</i>	The vertical alignment of some resource.

4.5.2 Details

class `pyiced.Align`

Alignment on an axis of a container.

See also:

`iced::Align`

START

Align at the start of the axis.

CENTER

Align at the center of the axis.

END

Align at the end of the axis.

class `pyiced.Clipboard`

A buffer for short-term storage and transfer within and between applications.

Warning: The clipboard is only valid during the call to *pyiced.IcedApp.update()*.

See also:

`iced::Clipboard`

read()

Reads the current content of the clipboard as text.

Returns The current contents of the clipboard.

Return type Optional[str]

write(value)

Writes the given text contents to the clipboard.

Parameters value (str) – The new contents of the clipboard.

class pyiced.FillMode

The fill mode of a rule.

See also:

[iced::widget::rule::FillMode](#)

FULL = FillMode.FULL

static asymmetric_padding(first_pad, second_pad)

Different offset on each end of the rule.

Parameters

- **first_pad** (int) – top or left, length units
- **second_pad** (int) – the other direction, length units

static padded(i)

Uniform offset from each end.

Parameters i (int) – Length units.

static percent(percentage)

Fill a percent of the length of the container. The rule will be centered in that container.

Parameters percentage (float) – The range is [0.0, 100.0]. The value gets clamped in this range automatically.

class pyiced.HorizontalAlignment

The horizontal alignment of some resource.

See also:

[iced::HorizontalAlignment](#)

LEFT

Align left

CENTER

Horizontally centered

RIGHT

Align right

class pyiced.ImageHandle

An [pyiced.image\(\)](#) handle.

See also:

[iced_native::widget::image::Handle](#)

static from_memory(*bytes*)

Creates an image handle containing the image data directly.

Parameters **bytes** (*bytes-like*) – The data of the image file.

Returns The new image handle.

Return type *ImageHandle*

static from_path(*path*)

Creates an image handle pointing to the image of the given path.

Parameters **path** (*pathlib.Path*) – The path of the image file.

Returns The new image handle.

Return type *ImageHandle*

class `pyiced.Instant`

A measurement of a monotonically nondecreasing clock. Opaque and useful only with duration.

- You can add/subtract a number of seconds as `float` to/from an instant to get a new instant.
- You can add/subtract a `timedelta` to/from an instant to get a new instant.
- You can subtract two instants to get the number of seconds as `float` between them: `later - earlier = seconds`.

See also:

`std::time::Instant`

class `pyiced.Length`

The strategy used to fill space in a specific dimension.

See also:

`iced::Length`

FILL = `Length.FILL`

SHRINK = `Length.SHRINK`

static fill_portion(*i*)

Fill a portion of the remaining space relative to other elements.

static units(*i*)

Fill a fixed amount of space.

class `pyiced.Line`(*color*, *width*)

A line.

It is normally used to define the highlight of something, like a split.

Parameters

- **color** (`Color`) – The color of the line.
- **width** (`float`) – The width of the line.

See also:

`iced::widget::pane_grid::Line`

color

The color of the line.

Returns The “color” parameter given when constructing this line.

Return type *Color*

width

The width of the line.

Returns The “width” parameter given when constructing this line.

Return type *float*

class `pyiced.Point(x, y)`

A 2D point.

Parameters

- **x** (*float*) – The X coordinate.
- **y** (*float*) – The Y coordinate.

See also:

`iced::Point`

`ORIGIN = Point(0, 0)`

distance(to)

Computes the distance to another point.

Parameters **to** (*Point*) – The other point.

x

The X coordinate.

Returns The “x” parameter given when constructing this point.

Return type *float*

y

The Y coordinate.

Returns The “y” parameter given when constructing this point.

Return type *float*

class `pyiced.Rectangle(top_left, size)`

A rectangle.

See also:

`iced::Rectangle`

Parameters

- **top_left** (*Point*) – The top-left corner.
- **size** (*Size*) – The size of the rectangle.

height

Height of the rectangle.

Returns The “size.height” parameter given when constructing this point.

Return type *float*

size

The size of the rectangle.

Returns The “size” parameter given when constructing this point.

Return type *Size*

top_left

The top-left corner.

Returns The “top_left” parameter given when constructing this point.

Return type *Point*

width

Width of the rectangle.

Returns The “size.width” parameter given when constructing this point.

Return type *float*

static with_size(size)

Creates a new Rectangle with its top-left corner at the origin and with the provided Size.

Parameters **size** (*Size*) – Size of the new Rectangle

Returns The new Rectangle.

Return type *Rectangle*

x

X coordinate of the top-left corner.

Returns The “top_left.x” parameter given when constructing this point.

Return type *float*

y

Y coordinate of the top-left corner.

Returns The “top_left.y” parameter given when constructing this point.

Return type *float*

class pylced.Size(width, height)

An amount of space in 2 dimensions.

Parameters

- **width** (*float*) – The width.
- **height** (*float*) – The height.

See also:

iced::Size

INFINITY = **Size**(inf, inf)

UNIT = `Size(1.0, 1.0)`

ZERO = `Size(0.0, 0.0)`

height

The height.

Returns The “height” parameter given when constructing this size.

Return type `float`

pad(padding)

Increments the Size to account for the given padding.

Parameters **padding** (`float`) – The other size.

width

The width.

Returns The “width” parameter given when constructing this size.

Return type `float`

class `pyiced.SliderHandle(proto, **kwargs)`

The appearance of the handle of a slider.

Parameters

- **proto** (`Optional[Union[SliderHandle, str]]`) – Source style sheet to clone and modify. Defaults to `iced_style`’s default style.

The valid string values are “active”, “hovered” and “dragging”, same as the argument for `SliderStyleSheet`.

None is the same as “active”.

- **shape** (`SliderHandleShape`) – The color of the slider_handle.
- **color** (`Color`) – The width of the slider_handle.
- **border_width** (`float`) – The width of the slider_handle.
- **border_color** (`Color`) – The width of the slider_handle.

See also:

`iced::widget::slider::Handle`

border_color

The “border_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type `Color`

border_width

The “border_width” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type `float`

color

The “color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

shape()**class** pylced.SliderHandleShape

The shape of the handle of a slider.

See also:

[iced::widget::slider::HandleShape](#)

static circle(*radius*)

A circle.

Parameters **radius** (*float*) – The radius of the circle

Returns A slider handle in the shape of a circle.

Return type *SliderHandleShape*

static rectangle(*width*, *border_radius*)

A rectangle.

Parameters

- **width** (*int*) – The length of an edge.
- **border_radius** (*float*) – The border radius.

Returns A slider handle in the shape of a rectangle.

Return type *SliderHandleShape*

class pylced.SvgHandle

An *svg()* handle.

See also:

[iced::widget::svg::Handle](#)

static from_memory(*bytes*)

Creates an SVG handle containing the image data directly.

Parameters **bytes** (*bytes-like*) – Creates an SVG Handle from raw bytes containing either an SVG string or gzip compressed data.

This is useful if you already have your SVG data in-memory, maybe because you downloaded or generated it procedurally.

Returns An SVG handle usable in *svg()*.

Return type *SvgHandle*

static from_path(*path*)

Creates an SVG Handle pointing to the vector image of the given path.

Parameters **path** (*path-like*) – Creates an SVG Handle pointing to the vector image of the given path.

Returns An SVG handle usable in *svg()*.

Return type *SvgHandle*

class `pyiced.TextInputCursor`(*state*)

A representation of cursor position in a `text_input()`.

There should be no reason to create or inspect this object directly.

Parameters `state` (`TextInputState`) – Text input state to inspect.

See also:

`iced_native::widget::text_input::cursor::Cursor`

selection(*value*)

Get the selected text.

Warning: If the state is currently in use, the method will fail.

Parameters `value` (*str*) – The current value of the `text_input()`.

Returns The selected text. May be empty.

Return type *str*

state(*value*)

Get the state of the `TextInputCursor()`.

The result is measured in terms of graphemes, not bytes or codepoints!

Warning: If the state is currently in use, the method will fail.

See also:

`pyiced.TextInputState.move_cursor_to()`

Returns

- *int* – The current cursor position when there's no selection.
- *Tuple[int, int]* – The selected text range.

class `pyiced.TooltipPosition`

The position of the tooltip.

See also:

`iced::widget::tooltip::Position`

FOLLOW_CURSOR

The tooltip will follow the cursor.

TOP

The tooltip will appear on the top of the widget.

BOTTOM

The tooltip will appear on the bottom of the widget.

LEFT

The tooltip will appear on the left of the widget.

RIGHT

The tooltip will appear on the right of the widget.

class `pyiced.VerticalAlignment`

The vertical alignment of some resource.

See also:

`iced::VerticalAlignment`

TOP

Align top

CENTER

Vertically centered

BOTTOM

Align bottom

4.6 Colors

4.6.1 Overview

<code>Color(r, g, b[, a])</code>	A color in the sRGB color space.
----------------------------------	----------------------------------

4.6.2 Details

class `pyiced.Color(r, g, b, a=1.0)`

A color in the sRGB color space.

Parameters

- **r** (*float*) – Red component, 0.0 – 1.0
- **g** (*float*) – Green component, 0.0 – 1.0
- **b** (*float*) – Blue component, 0.0 – 1.0
- **a** (*float*) – Alpha channel, 0.0 – 1.0 (0.0 = transparent; 1.0 = opaque)

BLACK = `Color(0, 0, 0)`

TRANSPARENT = `Color(0, 0, 0, a=0)`

WHITE = `Color(1, 1, 1)`

a

Alpha channel, 0.0 – 1.0 (0.0 = transparent; 1.0 = opaque)

Returns Color channel value

Return type *float*

b

Blue component, 0.0 – 1.0

Returns Color channel value

Return type `float`

g

Green component, 0.0 – 1.0

Returns Color channel value

Return type `float`

r

Red component, 0.0 – 1.0

Returns Color channel value

Return type `float`

4.6.3 Named Colors

`pyiced.css_color` exports `pyiced.Color` constants for all 148 named [CSS Color Module Level 4](#) colors.

`pyiced.css_color.ALICEBLUE`

`pyiced.css_color.ANTIQUEWHITE`

`pyiced.css_color.AQUA`

`pyiced.css_color.AQUAMARINE`

`pyiced.css_color.AZURE`

`pyiced.css_color.BEIGE`

`pyiced.css_color.BISQUE`

`pyiced.css_color.BLACK`

`pyiced.css_color.BLANCHEDALMOND`

`pyiced.css_color.BLUE`

`pyiced.css_color.BLUEVIOLET`

`pyiced.css_color.BROWN`

`pyiced.css_color.BURLYWOOD`

`pyiced.css_color.CADETBLUE`

`pyiced.css_color.CHARTREUSE`

`pyiced.css_color.CHOCOLATE`

`pyiced.css_color.CORAL`

`pyiced.css_color.CORNFLOWERBLUE`

`pyiced.css_color.CORNSILK`
`pyiced.css_color.CRIMSON`
`pyiced.css_color.CYAN`
`pyiced.css_color.DARKBLUE`
`pyiced.css_color.DARKCYAN`
`pyiced.css_color.DARKGOLDENROD`
`pyiced.css_color.DARKGRAY`
`pyiced.css_color.DARKGREEN`
`pyiced.css_color.DARKGREY`
`pyiced.css_color.DARKKHAKI`
`pyiced.css_color.DARKMAGENTA`
`pyiced.css_color.DARKOLIVEGREEN`
`pyiced.css_color.DARKORANGE`
`pyiced.css_color.DARKORCHID`
`pyiced.css_color.DARKRED`
`pyiced.css_color.DARKSALMON`
`pyiced.css_color.DARKSEAGREEN`
`pyiced.css_color.DARKSLATEBLUE`
`pyiced.css_color.DARKSLATEGRAY`
`pyiced.css_color.DARKSLATEGREY`
`pyiced.css_color.DARKTURQUOISE`
`pyiced.css_color.DARKVIOLET`
`pyiced.css_color.DEEPPINK`
`pyiced.css_color.DEEPSKYBLUE`
`pyiced.css_color.DIMGRAY`
`pyiced.css_color.DIMGREY`
`pyiced.css_color.DODGERBLUE`
`pyiced.css_color.FIREBRICK`
`pyiced.css_color.FLORALWHITE`
`pyiced.css_color.FORESTGREEN`
`pyiced.css_color.FUCHSIA`

`pyiced.css_color.GAINSBORO`
`pyiced.css_color.GHOSTWHITE`
`pyiced.css_color.GOLD`
`pyiced.css_color.GOLDENROD`
`pyiced.css_color.GRAY`
`pyiced.css_color.GREEN`
`pyiced.css_color.GREENYELLOW`
`pyiced.css_color.GREY`
`pyiced.css_color.HONEYDEW`
`pyiced.css_color.HOTPINK`
`pyiced.css_color.INDIANRED`
`pyiced.css_color.INDIGO`
`pyiced.css_color.IVORY`
`pyiced.css_color.KHAKI`
`pyiced.css_color.LAVENDER`
`pyiced.css_color.LAVENDERBLUSH`
`pyiced.css_color.LAWNGREEN`
`pyiced.css_color.LEMONCHIFFON`
`pyiced.css_color.LIGHTBLUE`
`pyiced.css_color.LIGHTCORAL`
`pyiced.css_color.LIGHTCYAN`
`pyiced.css_color.LIGHTGOLDENRODYELLOW`
`pyiced.css_color.LIGHTGRAY`
`pyiced.css_color.LIGHTGREEN`
`pyiced.css_color.LIGHTGREY`
`pyiced.css_color.LIGHTPINK`
`pyiced.css_color.LIGHTSALMON`
`pyiced.css_color.LIGHTSEAGREEN`
`pyiced.css_color.LIGHTSKYBLUE`
`pyiced.css_color.LIGHTSLATEGRAY`
`pyiced.css_color.LIGHTSLATEGREY`

`pyiced.css_color.LIGHTSTEELBLUE`
`pyiced.css_color.LIGHTYELLOW`
`pyiced.css_color.LIME`
`pyiced.css_color.LIMEGREEN`
`pyiced.css_color.LINEN`
`pyiced.css_color.MAGENTA`
`pyiced.css_color.MAROON`
`pyiced.css_color.MEDIUMAQUAMARINE`
`pyiced.css_color.MEDIUMBLUE`
`pyiced.css_color.MEDIUMORCHID`
`pyiced.css_color.MEDIUMPURPLE`
`pyiced.css_color.MEDIUMSEAGREEN`
`pyiced.css_color.MEDIUMSLATEBLUE`
`pyiced.css_color.MEDIUMSPRINGGREEN`
`pyiced.css_color.MEDIUMTURQUOISE`
`pyiced.css_color.MEDIUMVIOLETRED`
`pyiced.css_color.MIDNIGHTBLUE`
`pyiced.css_color.MINTCREAM`
`pyiced.css_color.MISTYROSE`
`pyiced.css_color.MOCCASIN`
`pyiced.css_color.NAVAJOWHITE`
`pyiced.css_color.NAVY`
`pyiced.css_color.OLDLACE`
`pyiced.css_color.OLIVE`
`pyiced.css_color.OLIVEDRAB`
`pyiced.css_color.ORANGE`
`pyiced.css_color.ORANGERED`
`pyiced.css_color.ORCHID`
`pyiced.css_color.PALEGOLDENROD`
`pyiced.css_color.PALEGREEN`
`pyiced.css_color.PALETURQUOISE`

`pyiced.css_color.PALEVIOLETRED`
`pyiced.css_color.PAPAYAWHIP`
`pyiced.css_color.PEACHPUFF`
`pyiced.css_color.PERU`
`pyiced.css_color.PINK`
`pyiced.css_color.PLUM`
`pyiced.css_color.POWDERBLUE`
`pyiced.css_color.PURPLE`
`pyiced.css_color.REBECCAPURPLE`
`pyiced.css_color.RED`
`pyiced.css_color.ROSYBROWN`
`pyiced.css_color.ROYALBLUE`
`pyiced.css_color.SADDLEBROWN`
`pyiced.css_color.SALMON`
`pyiced.css_color.SANDYBROWN`
`pyiced.css_color.SEAGREEN`
`pyiced.css_color.SEASHELL`
`pyiced.css_color.SIENNA`
`pyiced.css_color.SILVER`
`pyiced.css_color.SKYBLUE`
`pyiced.css_color.SLATEBLUE`
`pyiced.css_color.SLATEGRAY`
`pyiced.css_color.SLATEGREY`
`pyiced.css_color.SNOW`
`pyiced.css_color.SPRINGGREEN`
`pyiced.css_color.STEELBLUE`
`pyiced.css_color.TAN`
`pyiced.css_color.TEAL`
`pyiced.css_color.THISTLE`
`pyiced.css_color.TOMATO`
`pyiced.css_color.TURQUOISE`

```
pyiced.css_color.VIOLET
pyiced.css_color.WHEAT
pyiced.css_color.WHITE
pyiced.css_color.WHITESMOKE
pyiced.css_color.YELLOW
pyiced.css_color.YELLOWGREEN
```

4.7 Fonts

4.7.1 Overview

<i>Font</i> (name, data)	A font.
<i>FontFamily</i>	A font family.
<i>FontId</i>	A unique per database face ID.
<i>FontStretch</i>	A CSS font-stretch .
<i>FontStyle</i>	Allows italic or oblique faces to be selected.
<i>FontWeight</i>	Specifies the weight of glyphs in the font, their degree of blackness or stroke thickness.
<i>findfont</i> ([family, weight, stretch, style])	Performs a CSS-like query and returns the best matched font face.
<i>systemfonts</i> ()	List loaded system fonts.

4.7.2 Details

class `pyiced.Font`(name, data)

A font.

The font does not get loaded multiple times, but instead the name is used to tell fonts apart. So you should use the same name for the same data in subsequent Font instance creations.

Parameters

- **name** (*str*) – The name of the external font
- **data** (*bytes-like*) – The bytes of the external font

See also:

`iced::Font`

Warning: The font data gets interned! Even if the module is unloaded / reloaded, some memory is lost until the interpreter is restarted.

DEFAULT = `Font.DEFAULT`

data

Bytes data of the font

Returns

- *memoryview* – The bytes data of the font.
- *None* – For *DEFAULT*.

name

Name of the font

Returns

- *str* – The name of the font.
- *None* – For *DEFAULT*.

class pyiced.FontFamily

A font family.

See also:

[fontdb::Family](#)

CURSIVE = **FontFamily.CURSIVE**

FANTASY = **FontFamily.FANTASY**

MONOSPACE = **FontFamily.MONOSPACE**

SANSSERIF = **FontFamily.SANSSERIF**

SERIF = **FontFamily.SERIF**

class pyiced.FontId

A unique per database face ID.

See also:

[fontdb::ID](#)

family

Corresponds to a Font Family in a TrueType font.

load()

Loads the referenced font into memory.

Returns The Font object to be used in e.g. *view()*.

Return type *Font*

monospaced

Indicates that the font face is monospaced.

name

Corresponds to a PostScript name in a TrueType font.

stretch

A font face stretch.

style

A font face style.

weight

A font face weight.

class `pyiced.FontStretch`

A CSS [font-stretch](#).

See also:

[fontdb::Stretch](#)

ULTRACONDENSED

50% width

EXTRACONDENSED

62.5% width

CONDENSED

75% width

SEMICONDENSED

87.5% width

NORMAL

100% width

SEMIEXPANDED

112.5% width

EXPANDED

125% width

EXTRAEXPANDED

150% width

ULTRAEXPANDED

200% width

class `pyiced.FontStyle`

Allows italic or oblique faces to be selected.

See also:

[fontdb::Style](#)

NORMAL

A face that is neither italic not obliqued.

ITALIC

A form that is generally cursive in nature.

OBLIQUE

A typically-sloped version of the regular face.

class `pyiced.FontWeight`

Specifies the weight of glyphs in the font, their degree of blackness or stroke thickness.

See also:

[fontdb::Weight](#)

```

BLACK = FontWeight.BLACK
BOLD = FontWeight.BOLD
EXTRABOLD = FontWeight.EXTRABOLD
EXTRALIGHT = FontWeight.EXTRALIGHT
LIGHT = FontWeight.LIGHT
MEDIUM = FontWeight.MEDIUM
NORMAL = FontWeight.NORMAL
SEMIBOLD = FontWeight.SEMIBOLD
THIN = FontWeight.THIN

value

```

`pyiced.findfont(family=None, weight=None, stretch=None, style=None)`

Performs a CSS-like query and returns the best matched font face.

Arguments can be given using their constants or using their CSS value, e.g.

```

>>> from pyiced import *
>>> findfont("serif", "extra-light", "normal", "italic")
FontId(name="TimesNewRomanPS-ItalicMT", family="Times New Roman",
        style=Italic, weight=Weight(400), stretch=Normal)

```

Parameters

- **families** (`Union[FontFamily, str, Iterable[Union[FontFamily, str]], None]`) – A prioritized (list of) font family names or generic family name(s). Defaults to `SANSSERIF`.
- **weight** (`Union[FontWeight, int, str, None]`) – Specifies the weight of glyphs in the font, their degree of blackness or stroke thickness. Defaults to `NORMAL`.
- **stretch** (`Union[FontStretch, str, None]`) – Selects a normal, condensed, or expanded face from a font family. Defaults to `NORMAL`.
- **style** (`Union[FontStyle, str, None]`) – Allows italic or oblique faces to be selected. Defaults to `NORMAL`.

Returns The best match found, if one was found.

Return type `Optional[FontId]`

See also:

`fontdb::Query`

`pyiced.systemfonts()`

List loaded system fonts.

Returns An iterator over all system fonts.

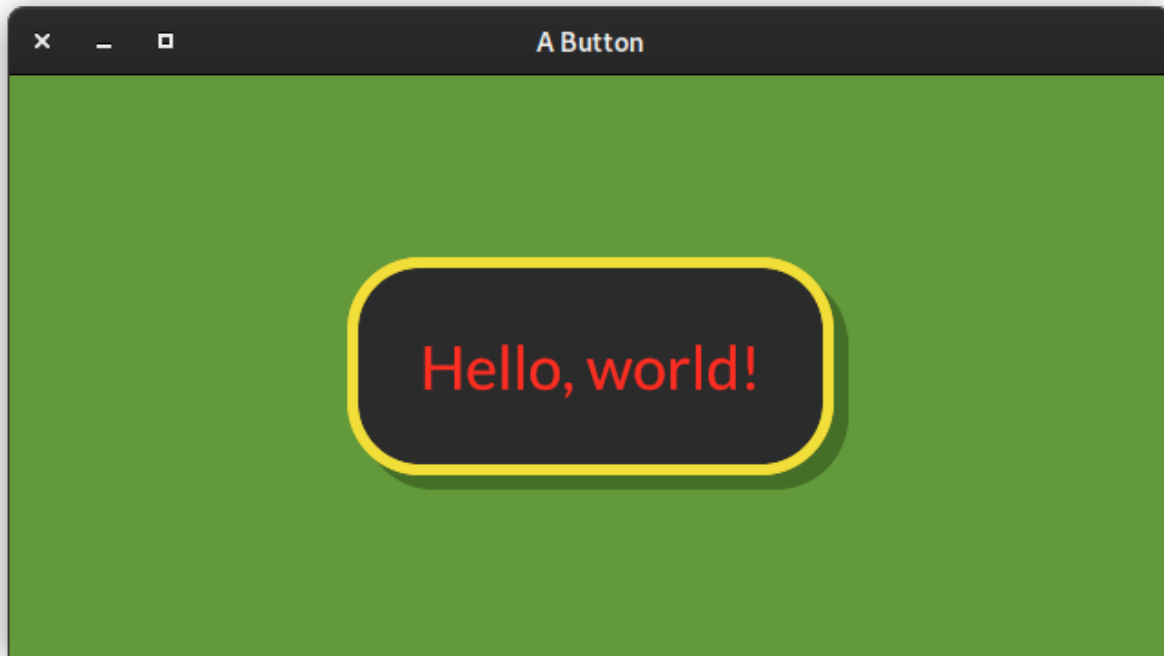
Return type `Iterator[FontId]`

4.8 Element Styles

4.8.1 Overview

<i>ButtonStyle</i> ([proto])	The appearance of a <i>button()</i> for a given state.
<i>ButtonStyleSheet</i> (active[, hovered, pressed, ...])	The appearance of a <i>button()</i> .
<i>CheckboxStyle</i> ([proto])	The appearance of a <i>checkbox()</i> for some state.
<i>CheckboxStyleSheet</i> (active[, hoverered, ...])	The appearance of a <i>checkbox()</i> .
<i>ContainerStyle</i>	alias of <i>pyiced.ContainerStyleSheet</i>
<i>ContainerStyleSheet</i> ([proto])	The appearance of a <i>container()</i> .
<i>PaneGridStyle</i>	alias of <i>pyiced.PaneGridStyleSheet</i>
<i>PaneGridStyleSheet</i> ([proto])	The appearance of a <i>pane_grid()</i> .
<i>PickListMenu</i> ([proto])	The appearance of a pick list menu.
<i>PickListStyle</i> ([proto])	The appearance of a <i>pick_list()</i> for some state.
<i>PickListStyleSheet</i> (menu, active[, hovered])	The appearance of a <i>pick_list()</i> .
<i>ProgressBarStyle</i>	alias of <i>pyiced.ProgressBarStyleSheet</i>
<i>ProgressBarStyleSheet</i> ([proto])	The appearance of a <i>progress_bar()</i> .
<i>RadioStyle</i> ([proto])	The appearance of a <i>radio()</i> for some state.
<i>RadioStyleSheet</i> (active[, hovered])	The appearance of a <i>radio()</i> .
<i>RuleStyle</i>	alias of <i>pyiced.RuleStyleSheet</i>
<i>RuleStyleSheet</i> ([proto])	The appearance of a <i>rule()</i> .
<i>ScrollableStyleSheet</i> (active[, hovered, dragging])	The appearance of a <i>scrollable()</i> .
<i>ScrollbarStyle</i> ([proto])	The appearance a specific state of a <i>scrollable()</i> .
<i>ScrollerStyle</i> ([proto])	The appearance of the scroller of a <i>scrollable()</i> .
<i>SliderStyle</i> ([proto])	The appearance of a <i>slider()</i> for some state.
<i>SliderStyleSheet</i> (active[, hovered, dragging])	The appearance of a <i>slider()</i> .
<i>TextInputStyle</i> ([proto])	The appearance of a <i>text_input()</i> for some state.
<i>TextInputStyleSheet</i> (active[, focused, ...])	The appearance of a <i>text_input()</i> .
<i>TooltipStyle</i>	alias of <i>pyiced.ContainerStyleSheet</i>
<i>TooltipStyleSheet</i>	alias of <i>pyiced.ContainerStyleSheet</i>

4.8.2 Quick Example



```
from pylced import (
    Align, button, ButtonState, ButtonStyle, ButtonStyleSheet, Color,
    container, ContainerStyle, IcedApp, Length, Settings, text,
    WindowSettings,
)

class ButtonExample(IcedApp):
    class settings(Settings):
        class window(WindowSettings):
            size = (640, 320)

    def __init__(self):
        self.__button_state = ButtonState()

    def title(self):
        return 'A Button'

    def view(self):
        styled_button = button(
            self.__button_state,
            text('Hello, world!', size=40),
            '',
            style=ButtonStyleSheet(ButtonStyle(
                shadow_offset=(8, 8), border_radius=40, border_width=6,
                background=Color(0.17, 0.17, 0.17),
                border_color=Color(0.95, 0.87, 0.22),
```

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```

        text_color=Color(1.00, 0.18, 0.13)
    ),
    padding=40,
)
return container(
    styled_button,
    style=ContainerStyle(background=Color(0.38, 0.60, 0.23)),
    padding=20, align_x=Align.CENTER, align_y=Align.CENTER,
    width=Length.FILL, height=Length.FILL,
)

if __name__ == '__main__':
    ButtonExample().run()

```

4.8.3 Details

class `pyiced.ButtonStyle(proto=None, **kwargs)`

The appearance of a `button()` for a given state.

Parameters

- **proto** (*Optional* [`ButtonStyleSheet`]) – Source style sheet to clone and modify. Defaults to `iced_style`’s default style.
- **shadow_offset** (*Tuple* [`float`, `float`]) – The button’s shadow offset.
- **background** (*Optional* [`Color`]) – The button’s background color.
- **border_radius** (`float`) – The button’s border radius.
- **border_width** (`float`) – The button’s border width.
- **border_color** (`Color`) – The button’s border color.
- **text_color** (`Color`) – The button’s text color.

See also:

`iced::widget::button::Style`

class `pyiced.ButtonStyleSheet(active, hovered=None, pressed=None, disabled=None)`

The appearance of a `button()`.

Parameters

- **active** (`ButtonStyle`) – Normal style of the button.
- **hovered** (*Optional* [`ButtonStyle`]) – Style of the button when the cursor is hovering over it. Defaults to a style derived from “active”.
- **pressed** (*Optional* [`ButtonStyle`]) – Style of the button while it’s pressed down. Defaults to a style derived from “active”.
- **disabled** (*Optional* [`ButtonStyle`]) – Style of the button when no “on_press” argument was given. Defaults to a style derived from “active”.

See also:

`iced::widget::button::StyleSheet`

active

The “active” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *ButtonStyle*

disabled

The “disabled” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *ButtonStyle*

hovered

The “hovered” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *ButtonStyle*

pressed

The “pressed” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *ButtonStyle*

class pyiced.CheckboxStyle(proto=None, **kwargs)

The appearance of a *checkbox()* for some state.

Parameters

- **proto** (*Optional[Union[CheckboxStyle, str]]*) – Source style sheet to clone and modify. Defaults to *iced_style*’s default style.

The valid string values are “active”, “hovered”, “active_checked” and “hovered_checked”, same as the argument for *pyiced.~CheckboxStyleSheet*.

None is the same as “active”.

- **background** (*Color*) – The checkbox’ background color.
- **checkmark_color** (*Color*) – The color of the checkbox.
- **border_radius** (*float*) – The checkbox’ border radius.
- **border_width** (*float*) – The checkbox’ border width.
- **border_color** (*Color*) – The checkbox’ border color.

See also:

iced::widget::checkbox::Style

background

The “background” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

border_color

The “border_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

border_radius

The “border_radius” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *float*

border_width

The “border_width” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *float*

checkmark_color

The “checkmark_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

class `pyiced.CheckboxStyleSheet`(*active*, *hovered*=None, *active_checked*=None, *hovered_checked*=None)

The appearance of a `checkbox()`.

Parameters

- **active** (*CheckboxStyle*) – Normal style of this checkbox.
- **hovered** (*Optional[CheckboxStyle]*) – Style when hovering over the checkbox. Defaults to the same style as “active”.
- **active_checked** (*Optional[CheckboxStyle]*) – Style of this checkbox when the checkbox is checked. Defaults to the same style as “active”.
- **hovered_checked** (*Optional[CheckboxStyle]*) – Style when hovering over the checked checkbox. If None or absent, it defaults to the first argument with an explicit value in “hovered”, “active_checked” or “active”.

See also:

`iced::widget::checkbox::StyleSheet`

active

The “active” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *CheckboxStyle*

active_checked

The “active_checked” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *CheckboxStyle*

hovered

The “hovered” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *CheckboxStyle*

hovered_checked

The “hovered_checked” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *CheckboxStyle*

pyiced.ContainerStyle

alias of *pyiced.ContainerStyleSheet*

class `pyiced.ContainerStyleSheet(proto=None, **kwargs)`

The appearance of a *container()*.

Parameters

- **proto** (*Optional[ContainerStyleSheet]*) – Source style sheet to clone and modify. Defaults to *iced_style*’s default style.
- **text_color** (*Optional[Color]*) – The container’s text color.
- **background** (*Optional[Color]*) – The container’s background color.
- **border_radius** (*float*) – The container’s border radius.
- **border_width** (*float*) – The container’s border width.
- **border_color** (*Color*) – The container’s border color.

See also:

- *iced::widget::container::Style*
- *iced::widget::container::StyleSheet*

background

The “background” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Optional[Color]*

border_color

The “border_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

border_radius

The “border_radius” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *float*

border_width

The “border_width” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *float*

text_color

The “text_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type Optional[*Color*]

pyiced.PaneGridStyle

alias of *pyiced.PaneGridStyleSheet*

class *pyiced.PaneGridStyleSheet*(*proto=None, **kwargs*)

The appearance of a pane_grid().

Parameters

- **proto** (Optional[*PaneGridStyleSheet*]) – Source style sheet to clone and modify. Defaults to *iced_style*’s default style.
- **picked_split** (Optional[*Line*]) – The line to draw when a split is picked.
- **hovered_split** (Optional[*Line*]) – The line to draw when a split is hovered.

See also:

- *iced::widget::pane_grid::Style*
- *iced::widget::pane_grid::StyleSheet*

hovered_split

The “hovered_split” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type Optional[*Line*]

picked_split

The “picked_split” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type Optional[*Line*]

class *pyiced.PickListMenu*(*proto=None, **kwargs*)

The appearance of a pick list menu.

Parameters

- **proto** (Optional[*PickListMenu*]) – Source style sheet to clone and modify. Defaults to *iced_style*’s default style.
- **text_color** (*Color*) – The text color of the menu.
- **background** (*Color*) – The background color of the menu.
- **border_width** (*float*) – The border width of the menu.
- **border_color** (*Color*) – The border color of the menu.
- **selected_text_color** (*Color*) – The text color of the selected element.
- **selected_background** (*Color*) – Text background color of the selected element.

See also:

iced::widget::pick_list::Menu

background

The “background” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

border_color

The “border_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

border_width

The “border_width” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *float*

selected_background

The “selected_background” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

selected_text_color

The “selected_text_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

text_color

The “text_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

class `pyiced.PickListStyle(proto=None, **kwargs)`

The appearance of a `pick_list()` for some state.

Parameters

- **proto** (*Optional[Union[PickListStyle, str]]*) – Source style sheet to clone and modify. Defaults to `iced_style`’s default style.

The valid string values are “active” and “hovered”, same as the argument for `PickListStyleSheet`.

None is the same as “active”.

- **text_color** (*Color*) – The pick list’s foreground color.
- **background** (*Color*) – The pick list’s background color.
- **border_radius** (*float*) – The pick list’s border radius.
- **border_width** (*float*) – The pick list’s border width.
- **border_color** (*Color*) – The pick list’s border color.
- **icon_size** (*float*) – The pick list’s arrow down icon size.

See also:

`iced::widget::pick_list::Style`

background

The “background” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

border_color

The “border_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

border_radius

The “border_radius” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *float*

border_width

The “border_width” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *float*

icon_size

The “icon_size” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *float*

text_color

The “text_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

class `pyiced.PickListStyleSheet`(*menu, active, hovered=None*)

The appearance of a `pick_list()`.

Parameters

- **menu** (*PickListMenu*) – Style of the drop down menu.
- **active** (*PickListStyle*) – Normal style of the pick list.
- **hovered** (*Optional [PickListStyle]*) – Style of the pick list when the cursor is hovering over it. Defaults to “active”.

See also:

`iced::widget::pick_list::StyleSheet`

active

The “active” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *PickListStyle*

hovered

The “hovered” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *PickListStyle*

menu

The “menu” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *PickListMenu*

pyiced.ProgressBarStyle

alias of *pyiced.ProgressBarStyleSheet*

class `pyiced.ProgressBarStyleSheet(proto=None, **kwargs)`

The appearance of a *progress_bar()*.

Parameters

- **background** (*Color*) – The progress bar’s background color.
- **bar** (*Color*) – The progress bar’s foreground color.
- **border_radius** (*float*) – The progress bar’s border radius.

See also:

- *iced::widget::progress_bar::Style*
- *iced::widget::progress_bar::StyleSheet*

background

The “background” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

bar

The “bar” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

border_radius

The “border_radius” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *float*

class pylced.**RadioStyle**(*proto=None, **kwargs*)

The appearance of a [radio\(\)](#) for some state.

Parameters

- **proto** (*Optional* [*Union* [[RadioStyle](#), *str*]]) – Source style sheet to clone and modify. Defaults to [iced_style](#)’s default style.
The valid string values are “active” and “hovered”, same as the argument for [RadioStyleSheet](#).
None is the same as “active”.
- **background** ([Color](#)) – The radio’s background color.
- **dot_color** ([Color](#)) – The color of the dot.
- **border_width** (*float*) – The radio’s border width.
- **border_color** ([Color](#)) – The radio’s border color.

See also:

[iced::widget::radio::Style](#)

background

The “background” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type [Color](#)

border_color

The “border_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type [Color](#)

border_width

The “border_width” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *float*

dot_color

The “dot_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type [Color](#)

class pylced.**RadioStyleSheet**(*active, hovered=None*)

The appearance of a [radio\(\)](#).

Parameters

- **active** ([RadioStyle](#)) – Normal style of the radio.
- **hovered** (*Optional* [[RadioStyle](#)]) – Style of the radio when the cursor is hovering over it. Defaults to “active”.

See also:

[iced::widget::radio::StyleSheet](#)

active

The “active” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *RadioStyle*

hovered

The “hovered” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *RadioStyle*

pyiced.RuleStyle

alias of *pyiced.RuleStyleSheet*

class `pyiced.RuleStyleSheet(proto=None, **kwargs)`

The appearance of a *rule()*.

Parameters

- **proto** (*Optional* [*RuleStyleSheet*]) – Source style sheet to clone and modify. Defaults to *iced_style*’s default style.
- **color** (*Color*) – The color of the rule.
- **width** (*int*) – The width (thickness) of the rule line.
- **radius** (*float*) – The radius of the line corners.
- **fill_mode** (*FillMode*) – The fill mode of the rule.

See also:

- *iced::widget::rule::Style*
- *iced::widget::rule::StyleSheet*

color

The “color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

fill_mode

The “fill_mode” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *FillMode*

radius

The “radius” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *float*

width

The “width” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

class pylced.ScrollableStyleSheet(*active*, *hovered=None*, *dragging=None*)

The appearance of a *scrollable()*.

Parameters

- **active** (*ScrollbarStyle*) – Normal style of the scrollable.
- **hovered** (*Optional[ScrollbarStyle]*) – Style of the scrollable when the cursor is hovering over it. Defaults to “active”.
- **dragging** (*Optional[ScrollbarStyle]*) – Style of a scrollbar that is being dragged. Defaults to “hovered”.

See also:

iced::widget::scrollable::StyleSheet

active

The “active” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *ScrollbarStyle*

dragging

The “dragging” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *ScrollbarStyle*

hovered

The “hovered” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *ScrollbarStyle*

class pylced.ScrollbarStyle(*proto=None*, ***kwargs*)

The appearance a specific state of a *scrollable()*.

Parameters

- **proto** (*Optional[Union[ScrollbarStyle, str]]*) – Source style sheet to clone and modify. Defaults to *iced_style*’s default style.
The valid string values are “active”, “hovered” and “dragging”, same as the argument for *ScrollableStyleSheet*.
None is the same as “active”.
- **background** (*Optional[Color]*) – The scrollbar’s background color.
- **border_radius** (*float*) – The scrollbar’s border radius.
- **border_width** (*float*) – The scrollbar’s border width.
- **border_color** (*Color*) – The scrollbar’s border color.
- **scroller** (*ScrollerStyle*) – The scroller of the scrollbar.

See also:

iced_style::scrollable::Scrollbar

background

The “background” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type Optional[*Color*]

border_color

The “border_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

border_radius

The “border_radius” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type float

border_width

The “border_width” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type float

scroller

The “scroller” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *ScrollerStyle*

class pylced.ScrollerStyle(proto=None, **kwargs)

The appearance of the scroller of a *scrollable()*.

Parameters

- **proto** (*Optional[Union[ScrollerStyle, str]]*) – Source style sheet to clone and modify. Defaults to *iced_style*’s default style.

The valid string values are “active”, “hovered” and “dragging”, same as the argument for *ScrollableStyleSheet*.

None is the same as “active”.

- **color** (*Color*) – The color of the scroller.
- **border_radius** (*float*) – The border radius of the scroller.
- **border_width** (*float*) – The border width of the scroller.
- **border_color** (*Color*) – The border color of the scroller.

See also:

iced_style::scrollable::Scroller

border_color

The “border_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

border_radius

The “border_radius” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type `float`

border_width

The “border_width” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type `float`

color

The “color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type `Color`

class `pyiced.SliderStyle(proto=None, **kwargs)`

The appearance of a `slider()` for some state.

Parameters

- **proto** (`Optional[Union[SliderStyle, str]]`) – Source style sheet to clone and modify. Defaults to `iced_style`’s default style.
The valid string values are “active”, “hovered” and “dragging”, same as the argument for `SliderStyleSheet`.
None is the same as “active”.
- **rail_colors** (`Tuple[Color, Color]`) – Colors of the rail.
- **handle** (`SliderHandle`) – Colors of the handle.

See also:

`iced::widget::slider::Style`

handle

The “handle” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type `SliderHandle`

rail_colors

The “rail_colors” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type `Tuple[Color, Color]`

class `pyiced.SliderStyleSheet(active, hovered=None, dragging=None)`

The appearance of a `slider()`.

Parameters

- **active** (`SliderStyle`) – Normal style of the slider.
- **hovered** (`Optional[SliderStyle]`) – Style of the slider when the cursor is hovering over it. Defaults to “active”.

- **dragging** (*Optional* [*SliderStyle*]) – Style of the slider is being dragged. Defaults to “hovered”.

See also:

`iced::widget::slider::StyleSheet`

class `pyiced.TextInputStyle(proto=None, **kwargs)`

The appearance of a `text_input()` for some state.

Parameters

- **proto** (*Optional* [*Union* [*TextInputStyle*, *str*]]) – Source style sheet to clone and modify. Defaults to `iced_style`’s default style.

The valid string values are “active”, “focused” and “hovered”, same as the argument for `TextInputStyleSheet`.

None is the same as “active”.

- **background** (*Color*) – The `text_input`’s background color.
- **border_radius** (*float*) – The `text_input`’s border radius.
- **border_width** (*float*) – The `text_input`’s border width.
- **border_color** (*Color*) – The `text_input`’s border color.

See also:

`iced::widget::text_input::Style`

background

The “background” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

border_color

The “border_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *Color*

border_radius

The “border_radius” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *float*

border_width

The “border_width” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type *float*

class `pyiced.TextInputStyleSheet(active, focused=None, hovered=None, placeholder_color=None, value_color=None, selection_color=None)`

The appearance of a `text_input()`.

Parameters

- **active** ([TextInputStyle](#)) – Normal style of the text_input.
- **focused** ([Optional \[TextInputStyle\]](#)) – Style of the text_input when the cursor is hovering over it. Defaults to “active”.
- **hovered** ([Optional \[TextInputStyle\]](#)) – Style of the text_input is being dragged. Defaults to “focused”.
- **placeholder_color** ([Optional \[Color\]](#)) – Text color of the placeholder text.
- **value_color** ([Optional \[Color\]](#)) – Color of the text.
- **selection_color** ([Optional \[Color\]](#)) – Color of the selection.

See also:

[iced::widget::text_input::StyleSheet](#)

active

The “active” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type [TextInputStyle](#)

focused

The “focused” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type [TextInputStyle](#)

hovered

The “hovered” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type [TextInputStyle](#)

placeholder_color

The “placeholder_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type [Color](#)

selection_color

The “selection_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type [Color](#)

value_color

The “value_color” parameter given to the constructor.

Returns The set, copied or defaulted value.

Return type [Color](#)

pyiced.TooltipStyle

alias of [pyiced.ContainerStyleSheet](#)

pyiced.TooltipStyleSheet

alias of [pyiced.ContainerStyleSheet](#)

4.9 Event Listening

4.9.1 Overview

<code>every(duration, token)</code>	Returns a <i>Subscription</i> that produces messages at a set interval.
<code>stream(async_generator)</code>	Listen for messages until the <i>asynchronous generator</i> is exhausted.
<i>Subscription</i>	TODO

4.9.2 Details

`pyiced.every(duration, token)`

Returns a *Subscription* that produces messages at a set interval.

The first *Message* is produced after a duration, and then continues to produce more messages every duration after that.

Parameters

- **duration** (*Union*[*float*, *datetime.timedelta*]) – The interval in seconds or as a duration. Must be at least 100 μ s!
- **token** (*object*) – The first item of the message tuple to send to the `pyiced.IcedApp.update()`.

Returns

The new subscription.

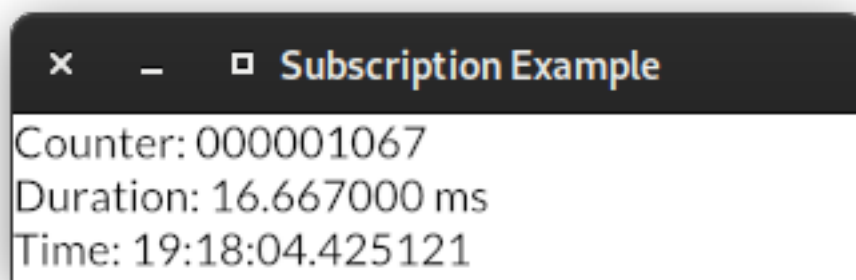
Every “duration” a message (`token`, `instant`) is sent to `pyiced.IcedApp.update()`.

See also:

Instant.

Return type *Subscription*

Example




```

from datetime import datetime, timedelta

from pyiced import (
    column, every, IcedApp, Instant, Settings, text, WindowSettings,
)

class SubscriptionExample(IcedApp):
    def __init__(self):
        self.__counter = 0
        self.__instant = Instant()
        self.__last_instant = self.__instant
        self.__ts = datetime.now().time()
        self.__subscription = every(timedelta(milliseconds=16.667), 'tick')

    class settings(Settings):
        class window(WindowSettings):
            size = (320, 64)

    def title(self):
        return 'Subscription Example'

    def view(self):
        duration = self.__instant - self.__last_instant
        return column([
            text(f'Counter: {self.__counter:09d}'),
            text(f'Duration: {duration * 10**3:9.6f} ms'),
            text(f'Time: {self.__ts}')
        ])

    def subscriptions(self):
        return [self.__subscription]

    def update(self, msg, clipboard):
        match msg:
            case ('tick', instant):
                self.__last_instant = self.__instant
                self.__counter += 1
                self.__instant = instant
                self.__ts = datetime.now().time()

if __name__ == '__main__':
    SubscriptionExample().run()

```

See also:

`iced_futures::time::every`

`pyiced.stream(async_generator)`

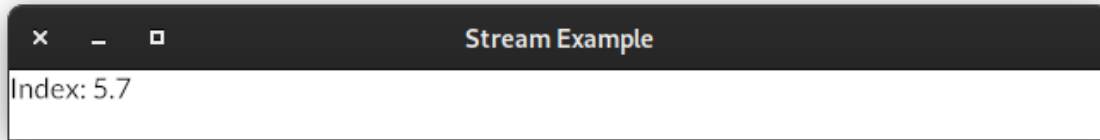
Listen for messages until the `asynchronous generator` is exhausted.

Parameters `async_generator` (`AsyncGenerator[Optional[object], None]`) – An asynchronous generator of messages.

Returns The wrapped generator.

Return type *Subscription*

Example



```
from asyncio import sleep

from pylced import column, IcedApp, stream, text

class StreamExample(IcedApp):
    def __init__(self):
        self.__stream = stream(self.__generator_func())
        self.__index = 0

    class settings:
        class window:
            size = (640, 40)

    def title(self):
        return 'Stream Example'

    def view(self):
        return column([text(f'Index: {self.__index / 10:.1f}')]])

    def subscriptions(self):
        if self.__stream is not None:
            return [self.__stream]

    def update(self, msg, clipboard):
        match msg:
            case 'done':
                self.__stream = None
            case int(index):
                self.__index = index

    async def __generator_func(self):
        for i in range(1, 101):
            yield i
            await sleep(0.1)
        yield 'done'

if __name__ == '__main__':
```

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`StreamExample().run()`

See also:

[iced_futures::subscription::Subscription](#)

class `pyiced.Subscription`

`TODO`

`NONE = <pyiced.Subscription object>`

`UNCAPTURED = <pyiced.Subscription object>`

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