COMP1021
Introduction to Computer Science

Handling Key Presses

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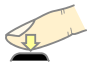
Pressing a Key

- Let's look at how to handle keys
- There are two kinds of action for a key:
  - pressing (push down) a key
  - releasing a key
- In this presentation we focus on handling the pressing (push down) of a key, which is usually more useful than the releasing of a key

The Key

- You have to state the name of a specific key when you set up the handling of a keyboard event
  - For example, you can use 'a', 'b', … 'z' or '0' … '9'
- You can also use a special name, such as:
  - 'Return' – Enter key
  - 'Escape' – Esc key
  - 'Up' – up arrow key
  - 'Down' – down arrow key

The Key Press Event



- The `onkeypress()` function assigns an event handling function for handling the key press event of a particular key
- For example:

```
def mykeyfunc():
    . . .
```

Whenever the user presses 'a' this function will be executed

```
turtle.onkeypress(mykeyfunc, 'a')
```

The key press event is applied to the turtle window

The `mykeyfunc` *function is assigned to the key press event*

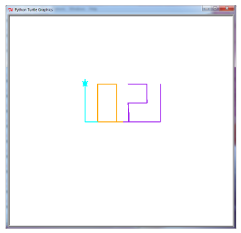
A key ('a' in this example) that is handled by the event handler

Listening for Keyboard Events

- Imagine you are using your computer normally
- When you press a key, the key goes to the window which currently has *focus*
- If you want key presses to go to your program, then you need to make sure your turtle window has the focus
- `turtle.listen()` does that – after this code, your program's turtle window has the focus
- (You also need `turtle.done()` at the end)

Key Events Example

- This example uses keys to control the movement of the turtle:
  - Up key – move forward
  - Down key – move backward
  - Left key – rotate left
  - Right key – rotate right
- It also allows colour change:
  - 'o' key – orange
  - 'p' key – purple
  - 'c' key – cyan



Key Events Example 1/3 – Event Handlers for Turtle Movement

```
pixels_for_one_step = 4
angle_for_rotation = 5
```

```
def moveforward():
    turtle.forward(pixels_for_one_step)

def movebackward():
    turtle.backward(pixels_for_one_step)
```

These event handler functions move the turtle forward (up arrow key) or backward (down arrow key)

```
def rotateleft():
    turtle.left(angle_for_rotation)

def rotateright():
    turtle.right(angle_for_rotation)
```

These event handler functions rotate the turtle to the left (left arrow key) or right (right arrow key)

Key Events Example 2/3 – Event Handlers for Changing Colour

```
def orange():
    # Change the pen color and
    # the turtle to orange
    turtle.color("orange")
```

For the 'o' key

```
def purple():
    # Change the pen color and
    # the turtle to purple
    turtle.color("purple")
```

For the 'p' key

```
def cyan():
    # Change the pen color and
    # the turtle to cyan
    turtle.color("cyan")
```

For the 'c' key

Key Events Example 3/3 – Main Program

```
turtle.shape("turtle")
turtle.speed(0)
turtle.color("purple")
turtle.width(3)
```

```
turtle.onkeypress(moveforward, "Up")
turtle.onkeypress(movebackward, "Down")
turtle.onkeypress(rotateleft, "Left")
turtle.onkeypress(rotateright, "Right")
```

Assign the up, down, left and right keys for moving the turtle

```
turtle.onkeypress(orange, "o")
turtle.onkeypress(purple, "p")
turtle.onkeypress(cyan, "c")
```

Assign the 'o', 'p' and 'c' keys for the colour change functions

```
turtle.listen()
```

Make sure keyboard presses go to the turtle window, not any another window

```
turtle.done()
```

Must have this at the end