

Beginning Python: Lesson 10

Event Handling

In this lesson we'll continue to use turtle and create a program that allows you to control the turtle on the screen with the arrow keys. To do this, you will learn how write a Python program that can respond to events. An event is something that can happen while your program is running. For example, a key being pressed. When an arrow key is pressed, this program executes a function which moves a turtle in the direction of the arrow.

Create a new file called **event_turtle.py** in your Python folder. Add the following code.

```
import turtle

wn = turtle.Screen()
wn.bgcolor('lightblue')
wn.title("Event Turtle")

speedy = turtle.Turtle()
speedy.shape('turtle')
speedy.penup()

def up():
    speedy.setheading(90)
    speedy.forward(45)

def left():
    speedy.setheading(180)
    speedy.forward(45)

def right():
    speedy.setheading(0)
    speedy.forward(45)

def down():
    speedy.setheading(270)
    speedy.forward(45)

turtle.onkey(up, "Up")
turtle.onkey(left, "Left")
turtle.onkey(right, "Right")
turtle.onkey(down, "Down")
```

```
turtle.listen()  
turtle.mainloop()
```

Now run the code. You should be able to move the turtle around the screen using the arrow keys.

Now lets add some new events

Drawing Lines

Put the following togglePen() function **just underneath the** `down()` function .

```
def togglePen():  
    if (speedy.isdown()):  
        speedy.penup()  
    else:  
        speedy.pendown()
```

Now add the following line of code **just after** `turtle.onkey(down, "Down")`

```
turtle.onkey(togglePen, "p")
```

Now run your program again. This time press the p button and see what happens when you move the turtle. The p button should switch the turtle's pen on and off.

Changing Colours

Now add the following code just after the `togglePen()` function

```
def changeColour():  
    speedy.color(random.choice(["red", "green", "blue"]))
```

This function changes the turtle's colour randomly to red, green, or blue. To make this happen when you press the "c" key. enter the following code after the last

`turtle.onkey(...)` line of code:

```
turtle.onkey(changeColour, "c")
```

Now run your code and see if it works. Everytime you press the "c" key the turtle's colour should change.

Challenges

- add an event that changes the width of the line
- change the program so that the turtle moves forward all the time and you steer it with

the arrow keys.