In-Class Question 14

Question)

A Python program is shown below. If you run the program and then enter **the last 3 digits of your student ID**, the program will show a password inside the turtle window.

```python
import turtle

turtle.hideturtle()
turtle.up()

def a():
    turtle.write("a")
    turtle.forward(10)

def b():
    turtle.write("b")
    turtle.forward(10)

def c():
    turtle.write("c")
    turtle.forward(10)

def d():
    turtle.write("d")
    turtle.forward(10)

def e():
    turtle.write("e")
    turtle.forward(10)

turtle.write("0")
turtle.forward(10)

turtle.onkeypress(e, "0")
turtle.onkeypress(e, "1")
```

```
turtle.write("2")
turtle.forward(10)

turtle.onkeypress(d, "2")
turtle.onkeypress(d, "3")

turtle.write("4")
turtle.forward(10)

turtle.onkeypress(c, "4")
turtle.onkeypress(c, "5")

turtle.write("6")
turtle.forward(10)

turtle.onkeypress(b, "6")
turtle.onkeypress(b, "7")

turtle.write("8")
turtle.forward(10)

turtle.onkeypress(a, "8")
turtle.onkeypress(a, "9")

turtle.write("*")
turtle.forward(10)

turtle.listen()

turtle.done()
```

For example, if your student ID is 20100123, you will need to run the program, and then enter the digit '1', the digit '2' and finally the digit '3'.

After running the program and entering **the last three digits of your student ID**, you can see a password inside the turtle window, what is the password shown inside the turtle window?

You need to enter the password. Don't use any space, full stops or anything like that.

Correct answer(s):

- `02468*edd` *(if your student ID is 20100123)*

Explanation:

- In this program, letters/digits/asterisk are shown inside the turtle window using this code:

  ```
  turtle.write( ... letter/digit/asterisk ... )
  turtle.forward(10)
  ```

- Some of the code is inside functions (used as event handlers) and some of it is run directly in the main code
- To get the answer, you need to know the order of running the code for the different characters you see inside the program
- After running the program, the main code produces six characters inside the turtle window: `02468*`
- It is important you understand that, for example, this code:

  ```
  turtle.onkeypress(e, "0")
  turtle.onkeypress(e, "1")
  ```

  does not run the `e()` function, but it only sets up the event handlers
- The event handlers will run later if the user presses the corresponding digits
- Assuming the last three digits of the student ID is 123, if the digits are pressed in this order, the key press event will run the event handlers `e()`, `d()` and `d()`
- These three letters will then be shown at the end of the six characters already shown inside the turtle window, and therefore the password is `02468*edd`