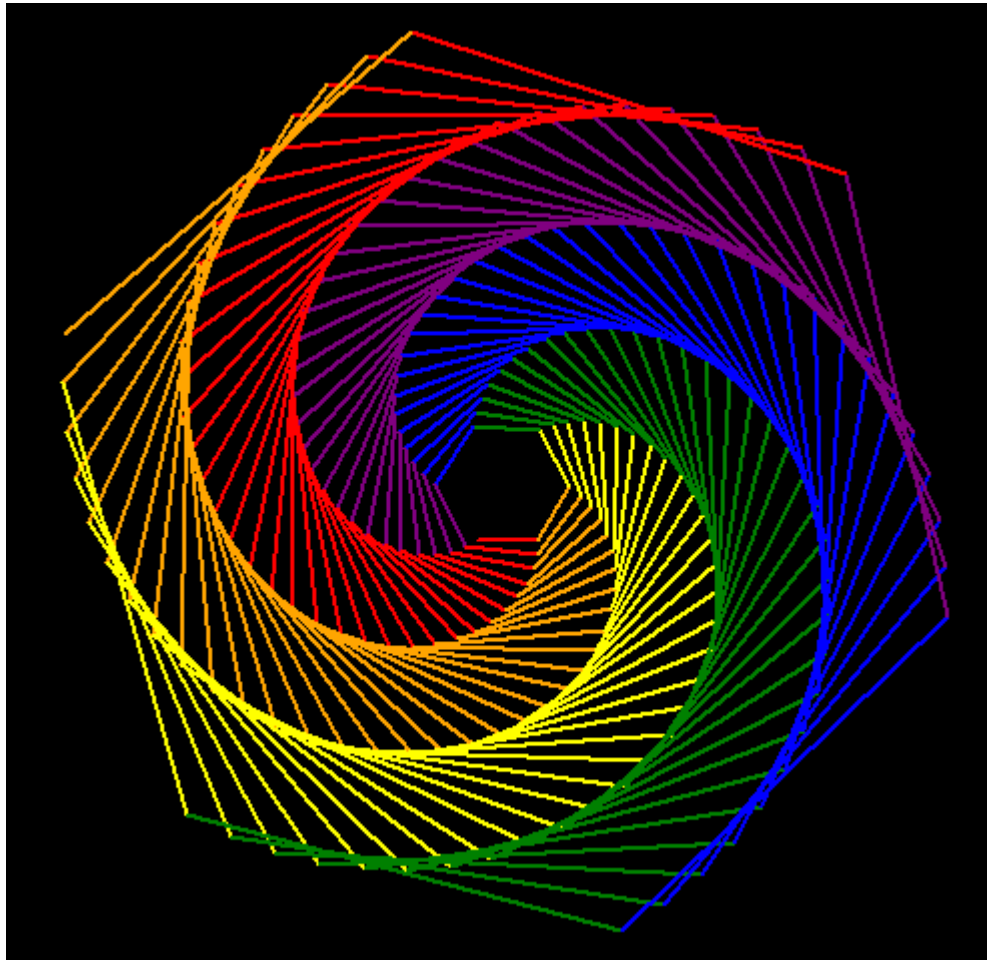
Repetitions

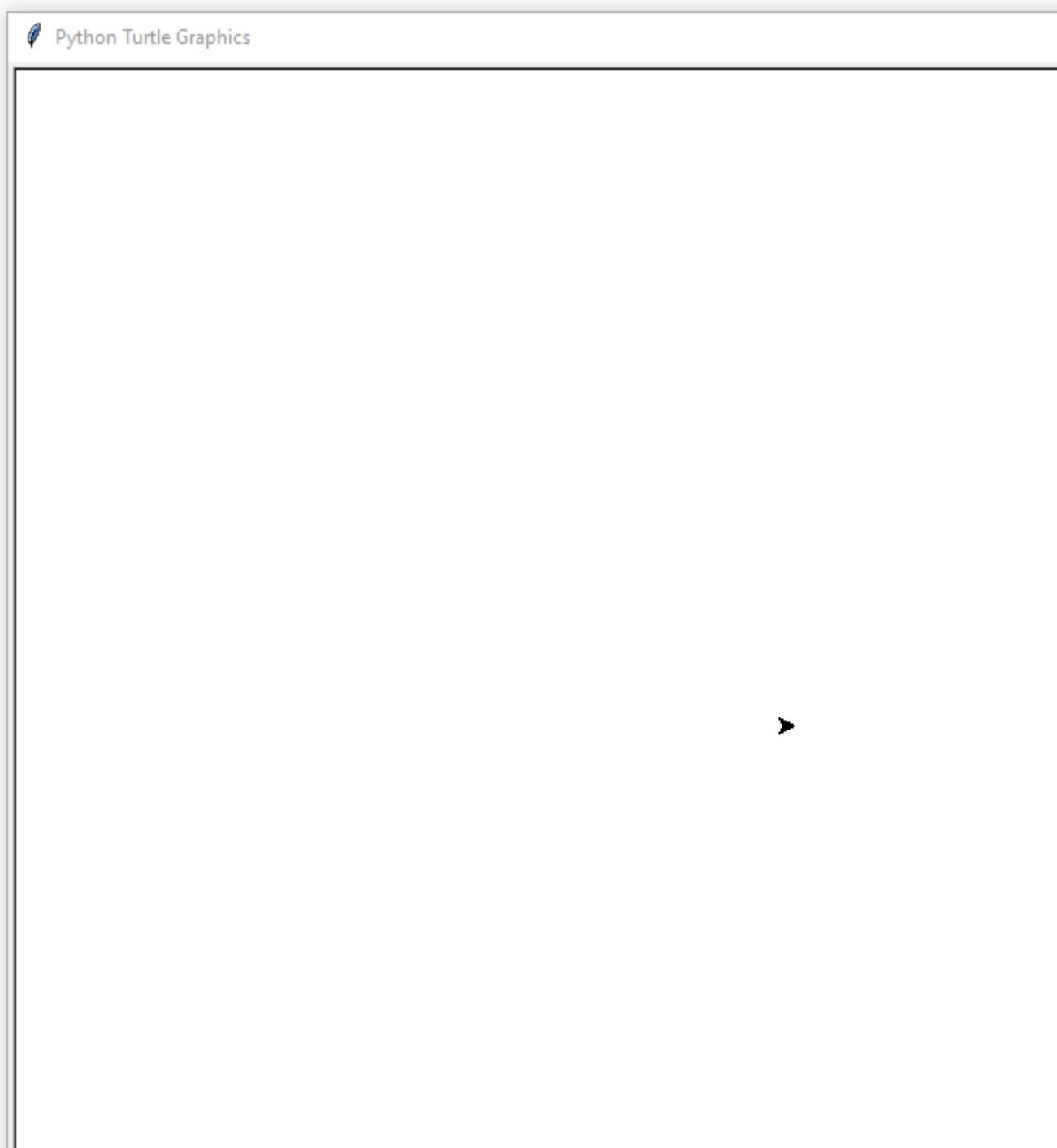
Turtle Graphics

- “A picture is worth a thousand words”



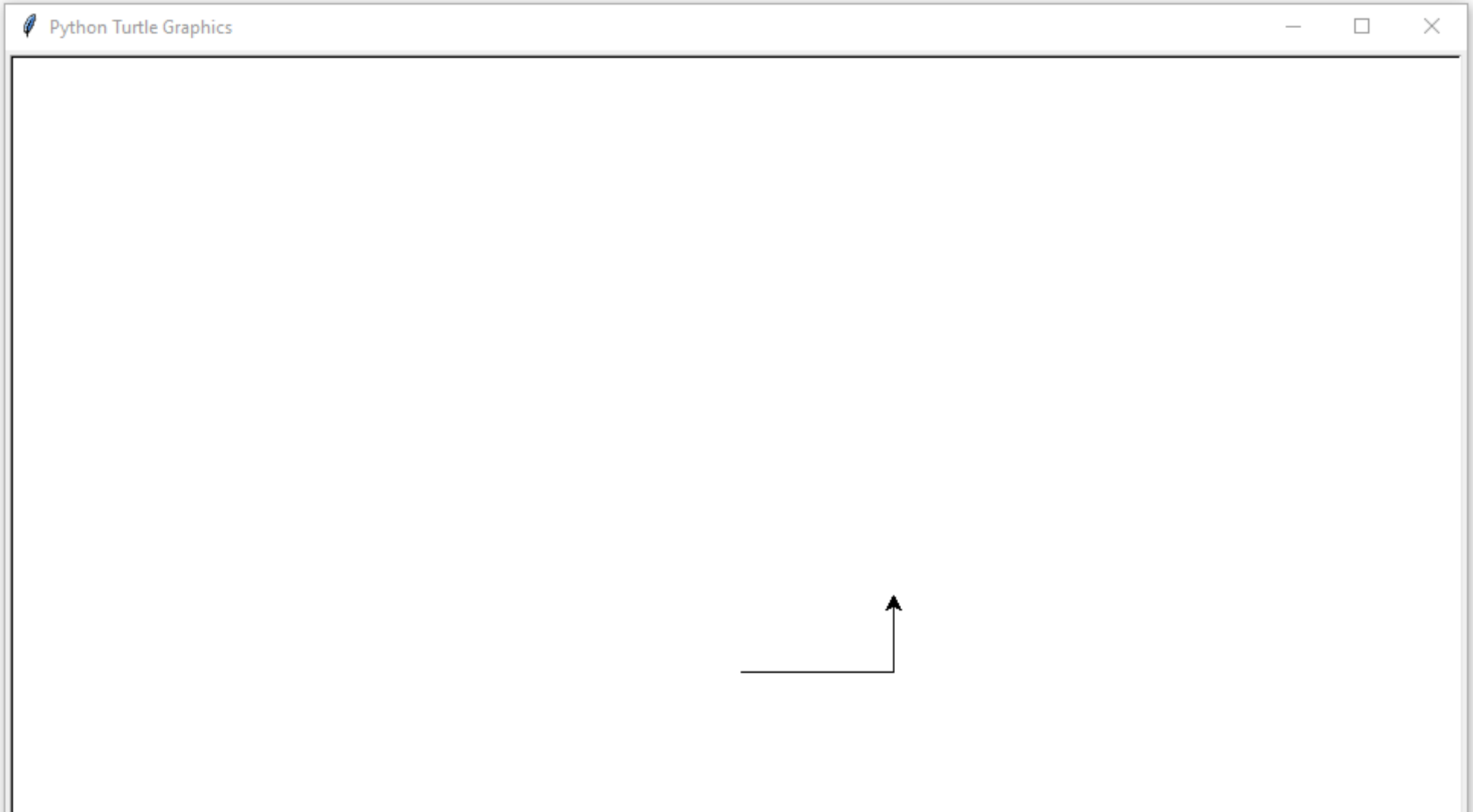
Turtle Graphics

- “Turtle” is a Python feature like a drawing board, which lets us command a turtle to draw all over it!
- Imagine you have a little turtle on the screen and facing East
  - *picture*
- Then you command it to go forward 100 pixels
- Then turn left 90 degree and walk another 50 pixels
  - *picture*



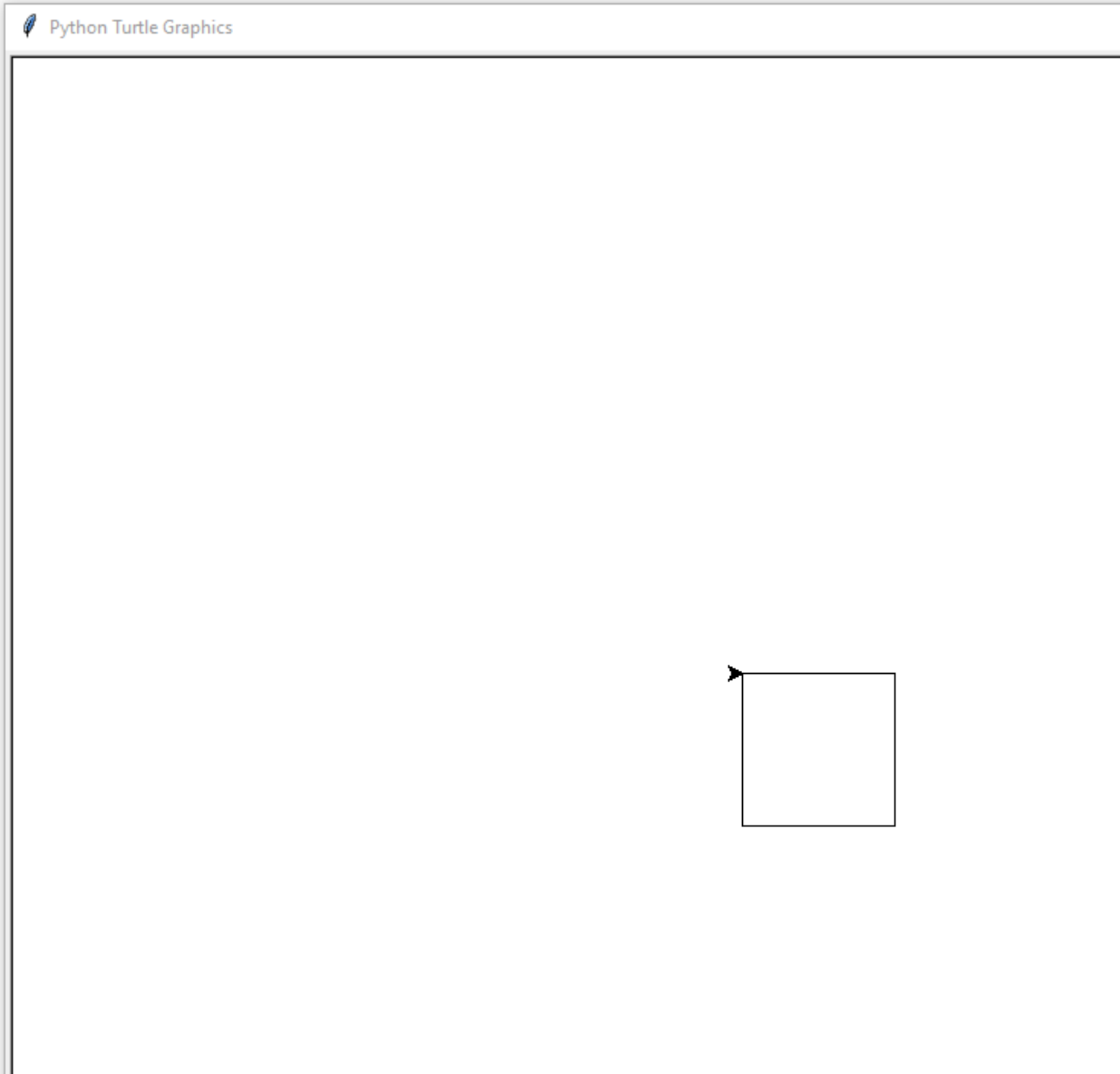
Then you command it to go forward 100 pixels

Then turn left 90 degree and walk another 50 pixels



Drawing a Square

```
forward(100)
right(90)
forward(100)
right(90)
forward(100)
right(90)
forward(100)
right(90)
```



Assignment 1

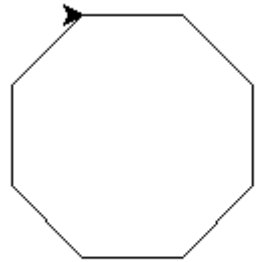
- Draw a triangle
- And share how you draw it
  - (You may be tempted to use for-loop now, but let’s try without it now)

To Draw a Triangle

```
from turtle import *

forward(100)
right(120)
forward(100)
right(120)
forward(100)
right(120)
```

```
forward(50)
right(45)
forward(50)
right(45)
forward(50)
right(45)
forward(50)
right(45)
forward(50)
right(45)
forward(50)
right(45)
forward(50)
right(45)
forward(50)
right(45)
forward(50)
right(45)
```



- How to draw a square, pentagon, octagon?

To Draw an Octagon

```
for i in range(0,8):
    forward(50)
    right(45)
```

vs

```
forward(50)
right(45)
forward(50)
right(45)
forward(50)
right(45)
forward(50)
right(45)
forward(50)
right(45)
forward(50)
right(45)
forward(50)
right(45)
forward(50)
right(45)
```

Repeat N times

- Draw an octagon

```
for i in range(0,8):
    forward(50)
    right(45)
```

- Start with the “for” keyword
- “i” is a variable, you can use any other name such as:
  - x, y1, counter
- The fact is that, it does not only repeat, but the variable i will change during the loop

Repeat N times

- Draw an octagon

```
for i in range(0,8):
    print("Here is the value of i:",i)
    forward(50)
    right(45)
```

Starts with

- On top of drawing, it will print:

```
Here is the value of i: 0
Here is the value of i: 1
Here is the value of i: 2
Here is the value of i: 3
Here is the value of i: 4
Here is the value of i: 5
Here is the value of i: 6
Here is the value of i: 7
```

Ends BEFORE

- Start with the “for” keyword
- “i” is a variable, you can use any other name such as:
  - x, y1, counter
- The fact is that, it does not only repeat, but the variable i will change during the loop

Exercise: Draw a Pentagon?

Exercise

- You put $10000 into your fixed deposit bank account and the annual interest is 4%
  - How much do you have after one year?
  - How much do you have after two years?
  - How much do you have after three years?
- How did you change this code to compute the amount after any years?
- Say after 10 years?

demo01.py - G:\My Drive\Courses\IT5001\Bootcamp\demo01.py (3.10.5)

File Edit Format Run Options Window Help

```
balance = 10000
rate = 0.04
balance_1y = balance * (1+rate)
print("After one year, the balance
print(balance_1y)
balance_2y = balance_1y * (1+rate)
print("After two years, the balance
print(balance_2y)
```