



Python Programming

Lesson 1: Python Turtle



<http://www.yahmad.co.uk/>

Introduction to Python and Variables

Objectives

Understand how to create and save programs in Python.

Understand the use of Variables and how to assign them values.

Understand the use of different commands such as PenUp/PenDown, goto, forward, backward, left, right and t.begin_fill() & t.end_fill().

Understand how use a for loop to repeat commands.

Outcomes

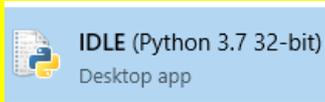
Time

| Task | Description | Time |
|--------|---|------|
| Task 1 | Open Python and Save a New File | 150 |
| Task 2 | Import Turtle and PenUp/Down | 100 |
| Task 3 | Create a Triangle | 50 |
| Task 4 | Creating shapes using a for loop | 50 |
| Task 5 | Extension: Create the additional shapes | 0 |

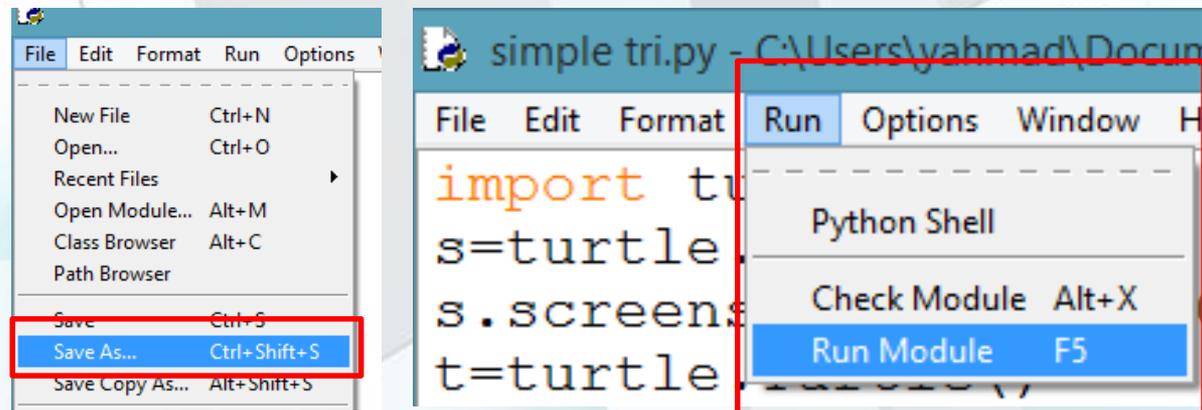
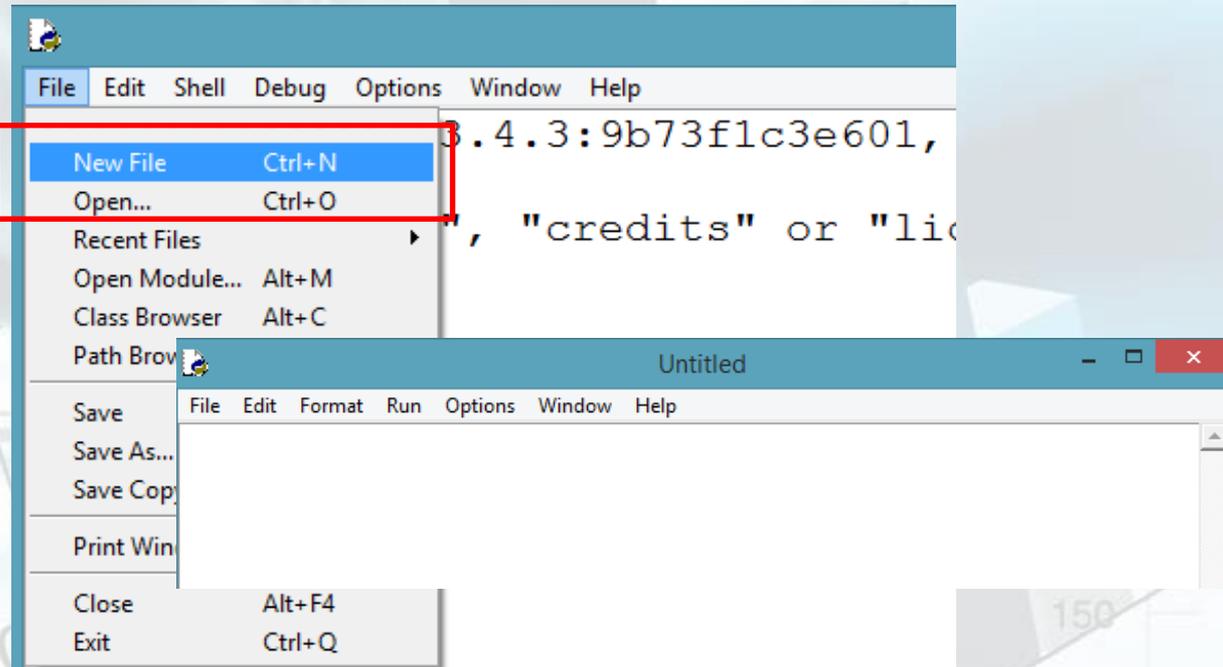
Task 1 – Open Python and Save a New File



1. Make a new Python Folder
2. Open Python Idle.



3. Click on File >> New
4. Save the program into your Python Folder
5. Run the Program
Run > Run Module



Task 2 – Import Turtle and PenUp/Down

Variable:
Placeholder to
store values
which can be
called upon later
in the program

PenDown: Will
move turtle and
draw a line.

PenUp: Will move
turtle and not draw
a line.

goto: Set the start
point of the turtle
using the **X & Y axis**

```
import turtle
s=turtle.Screen()
s.screensize(2000,2000)
t=turtle.Turtle()
```

```
pen_color=input("Enter Pen Color: ")
t.color(pen_color)
```

```
t.penup()
t.goto(-200,0)
t.pendown()
t.forward(100)
```

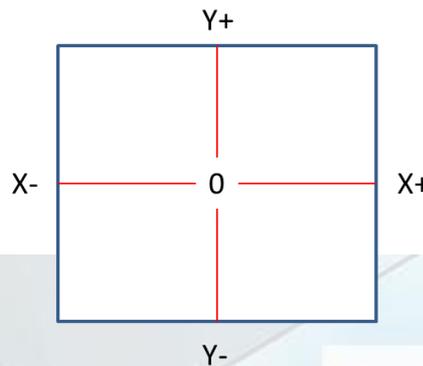
```
pen_color=input("Enter Pen Color: ")
t.color(pen_color)
```

```
t.penup()
t.forward(100)
t.pendown()
t.forward(100)
```



1. Import the Turtle into Python.
2. Enter the script and run the program.
3. You will be prompted to enter the colour for each line.

Two lines will be drawn with a gap.



```
=====  
>>>  
Enter Pen Color: Red  
Enter Pen Color: Blue  
>>> |
```

Extension: Add an extra line with the same spacing as the previous line.

Task 2 – Create a Triangle

File Edit Format Run Options Window Help

```
import turtle
s=turtle.Screen()
s.screensize(2000,2000)
t=turtle.Turtle()

pen_color=input("Enter Pen Color: ")
fill_color=input("Enter Fill Color: ")
t.color(pen_color,fill_color)

t.begin_fill()
t.forward(100)
t.left(120)
t.forward(100)
t.left(120)
t.forward(100)
t.left(120)
t.end_fill()
```

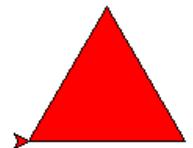
t.begin_fill() & t.end_fill(): Colours in the shape

```
>>> =====
===== RESTART =====
=====
>>>
Enter Pen Color: black
Enter Fill Color: red
>>> |
```

Variable: User will input values into the variables for **pen_color** and **fill_color**

t.color will include the pen and fill colour

1. You need to create a simple program to **draw and fill a triangle**.
2. You will be prompted to enter the Pen and Fill Colour.



Extension: Change each length to 200

Task 2 – Create a Triangle

```
t.penup()
t.goto(-150,0)
t.pendown()
t.begin_fill()
t.forward(100)
t.left(90)
t.forward(100)
t.left(90)
t.forward(100)
t.left(90)
t.forward(100)
t.left(90)
t.end_fill()
```

Script to move the turtle to the start point without drawing a line.

3. Enter the following code at the end of the same program. Then run the program.

Identify which steps are being repeated.

```
import turtle
s=turtle.Screen()
s.screensize(2000,2000)
t=turtle.Turtle()

pen_color=input("Enter Pen Color: ")
fill_color=input("Enter Fill Color: ")
t.color(pen_color,fill_color)

t.begin_fill()
t.forward(100)
t.left(120)
t.forward(100)
t.left(120)
t.forward(100)
t.left(120)
t.end_fill()

t.penup()
t.goto(-150,0)
t.pendown()
t.begin_fill()
t.forward(100)
t.left(90)
t.forward(100)
t.left(90)
t.forward(100)
t.left(90)
t.forward(100)
t.left(90)
t.end_fill()
```

Extension: Draw a pentagon to the left of the square.

The start point for the pentagon will be:
X(-300)
Y(0)

Side (100) left (72)

```
===== RESTART =====
>>>
Enter Pen Color: Red
Enter Fill Color: green
>>> |
```

Start point to draw the turtle



Task 3 – Creating shapes using a for loop

```
repeat tri.py - C:/Users/yahmad/Documents/Python/yr 7/repeat tri.py
File Edit Format Run Options Window Help
import turtle
s=turtle.Screen()
s.screensize(2000,2000)
t=turtle.Turtle()

pen_color=input("Enter Pen Color: ")
fill_color=input("Enter Fill Color: ")
t.color(pen_color,fill_color)

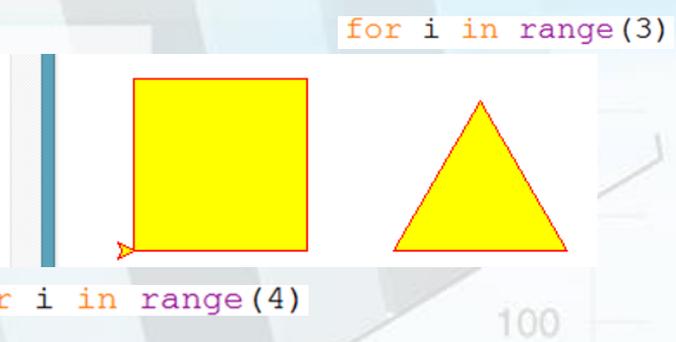
t.begin_fill()
for i in range(3):
    t.forward(100)
    t.left(120)
t.end_fill()

t.penup()
t.goto(-150,0)
t.pendown()

t.begin_fill()
for i in range(4):
    t.forward(100)
    t.left(90)
t.end_fill()
```

1. You need to create a simple program to create a triangle and square.
2. You will be prompted to enter the Pen and Fill Colour.

```
=====
>>>
Enter Pen Color: Red
Enter Fill Color: Yellow
>>> |
```



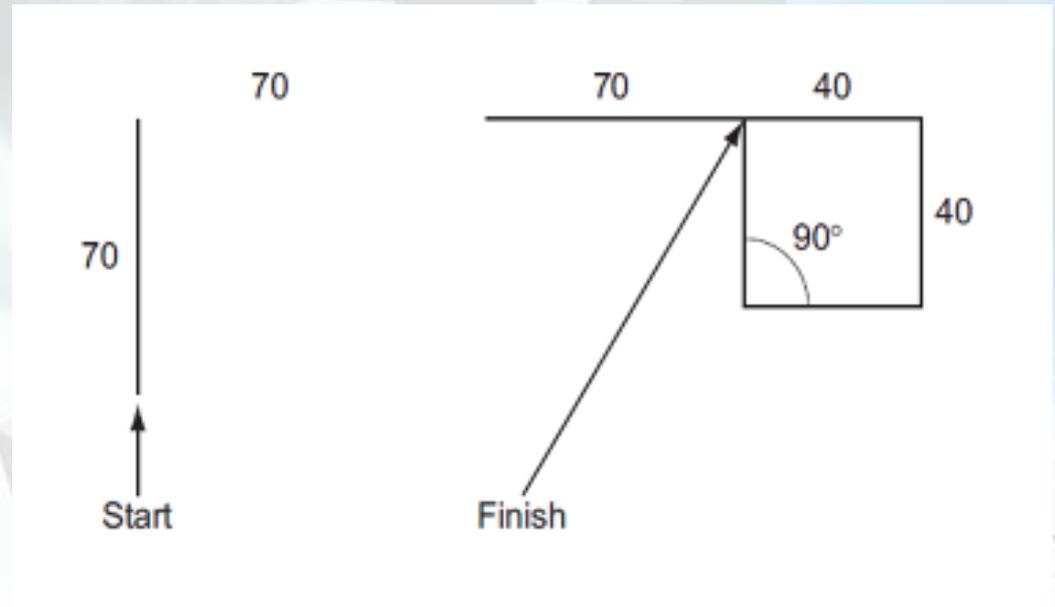
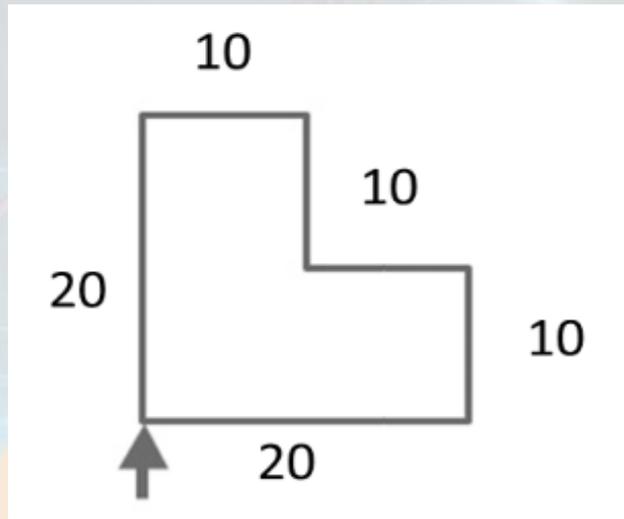
Script to move the turtle to the start point for the square without drawing a line.

Extension: Draw a pentagon to the left of the square using a for loop.

The start point for the pentagon will be:
X(-300)
Y(0)

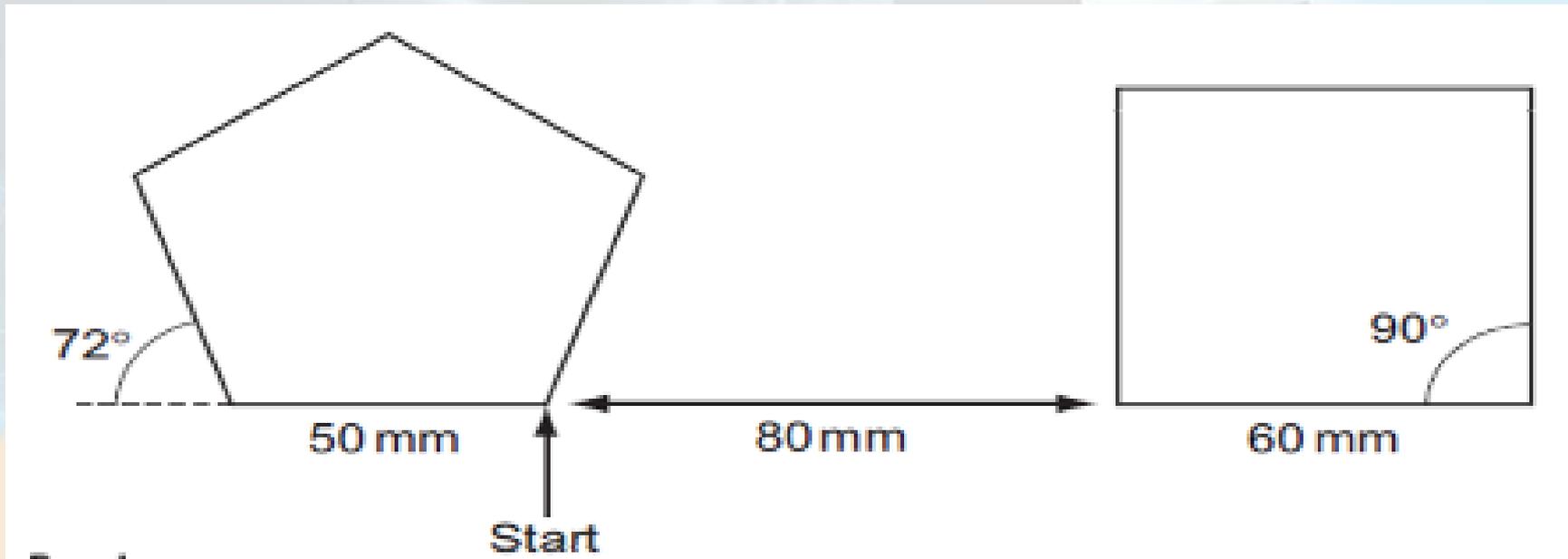
Side (100) left (72)

Task 4 – Create the following Shapes



1. You need to create a simple program to **create the following shapes**.
2. You may use a **for loop** to reduce your code.

Task 4 – Create the following Shapes



1. You need to create a simple program to **create the following shapes**.
2. You may use a **for loop** to reduce your code.

Plenary – Refer to the Lesson Objectives

Objectives

Understand how to create and save programs in Python.

Understand the use of Variables and how to assign them values.

Understand the use of different commands such as PenUp/PenDown, goto, forward, backward, left, right and t.begin_fill() & t.end_fill().

Understand how use a for loop to repeat commands.

Plenary Task (Q&A)

Peer assess each other scripts.

Question: What is the purpose of variables?

Question: What are the different data types of commands you have used in this lesson.