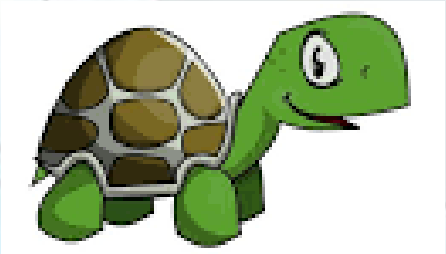
Programming

python Programming

Python Programming

Lesson 2: Python Turtle (IF and Nested Conditions)



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Programming

Python and Variables

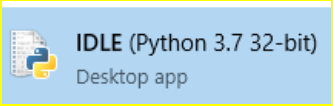
Objectives
Understand how to create and save programs in Python.
Understand the use of Variables and how to assign them values.
Understand the use of printing statements and joining variables
Understand how use a for loop to repeat commands.

Outcomes		Time
Task 1	**Shape Program**	
Task 2	**Shape Program (IF Condition)**	
Task 3	**Shape Program (Nested Conditions)**	
Task 4	**Extension**	

Programming

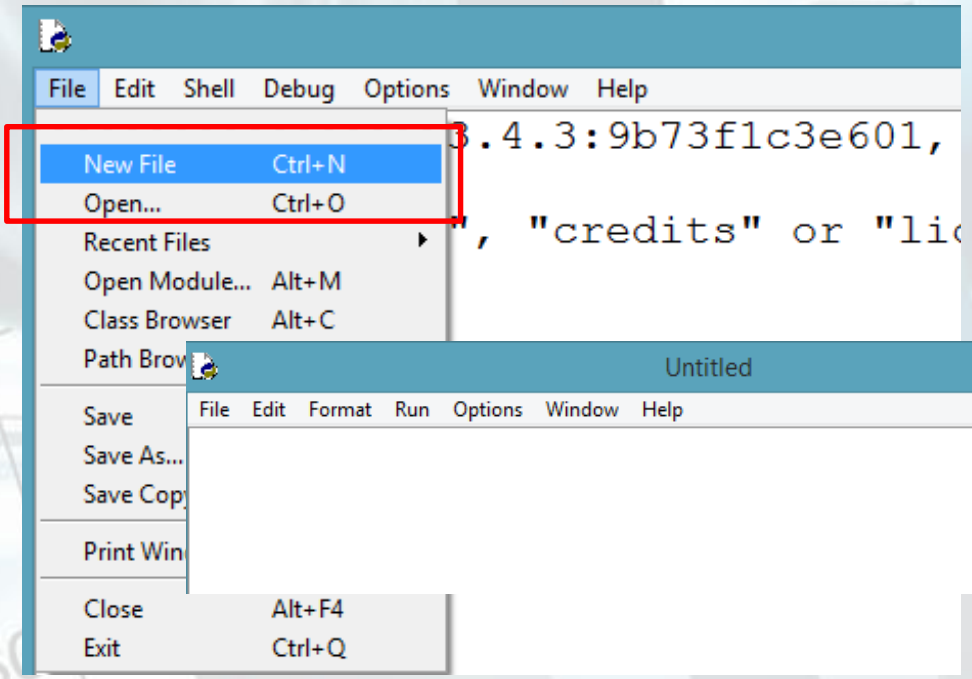
Open Python and Save a New File

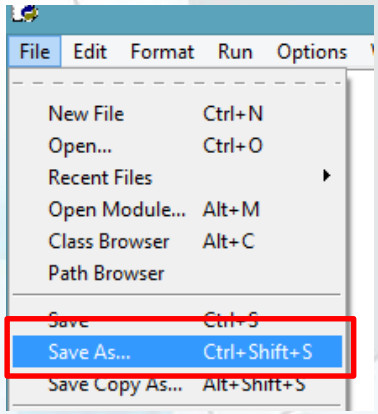
1. Make a new Python Folder
2. Open Python Idle.

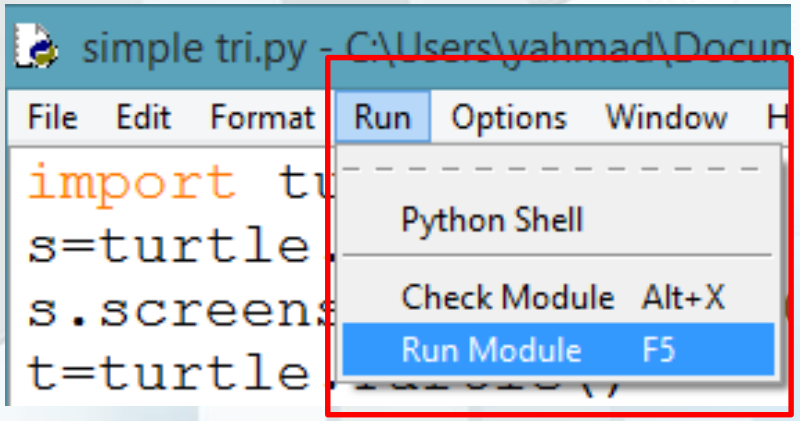


3. Click on File >> New
4. Save the program into your Python Folder
5. Run the Program

Run > Run Module







Task 1 – Shape Program

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

shape=input("What shape are you drawing? ")
steps=int(input("Enter the number of steps for each side? "))
sides=int(input("How many sides does your shape have? "))
angle=360/sides

print ("You have deciced to draw a "+shape+".")
print ("You will have "+str(steps)+" steps for each side")
print ("Your shapes will have "+str(sides)+" sides.")
print ("The turn angle will be "+str(angle)+" degrees.")

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(sides):
    t.forward(steps)
    t.left(angle)
t.end_fill()
```

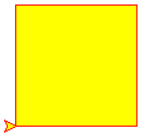
Variables: User will input values into the variables for the following:

- Shape
- Number of steps per each side
- The number of sides
- Pen and Fill colour

The angle will be worked out automatically by dividing 360 by the number of sides.

Print statements will print user input. (+ joins variables)

```
>>>
What shape are you drawing? square
Enter the number of steps for each side? 100
How many sides does your shape have? 4
You have deciced to draw a square.
You will have 100 steps for each side
Your shapes will have 4 sides.
The turn angle will be 90.0 degrees.
Enter Pen Color: red
Enter Fill Color: yellow
>>>
```



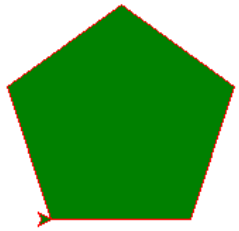
1. Enter the script shown to the left.
2. Run the program.

The program will create any shape using a for loop based on your input.

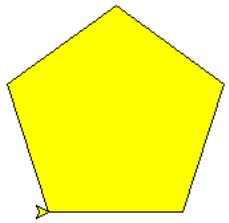
Task 2 – Shape Program (IF Condition)

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

shape=input("What shape are you drawing? ")
steps=int(input("Enter the number of steps for each side? "))
sides=int(input("How many sides does your shape have? "))
angle=360/sides

if steps <100:
    t.color("red","green")
else:
    t.color("black","yellow")

t.begin_fill()
for i in range(sides):
    t.forward(steps)
    t.left(angle)
t.end_fill()
```

```
>>>
What shape are you drawing? pentagon
Enter the number of steps for each side? 99
How many sides does your shape have? 5
>>>
```



```
>>>
What shape are you drawing? Pentagon
Enter the number of steps for each side? 101
How many sides does your shape have? 5
>>>
```



IF Condition:

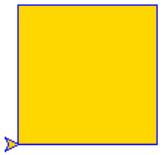
If the user has entered less than 100 steps per each side then the outline of the shape will be red and the fill will be green.

If the steps per each side is not less than 100 then the outline of the shape will be black and the fill will be yellow.

Task 3 – Shape Program (Nested Conditions)

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

shape=input("What shape are you drawing? ")
steps=int(input("Enter the number of steps for each side? "))
sides=int(input("How many sides does your shape have? "))
angle=360/sides

if sides==3:
    t.color("orange","purple")
elif sides==4:
    t.color("blue","gold")
elif sides==5:
    t.color("red","green")
else:
    t.color("black","yellow")

t.begin_fill()
for i in range(sides):
    t.forward(steps)
    t.left(angle)
t.end_fill()
```

```
>>>
What shape are you drawing? square
Enter the number of steps for each side? 100
How many sides does your shape have? 4
>>>
```



Nested Condition:

If the sides is equal (==) to 3 the Pen Colour will be Orange and the Fill Colour will be Purple.

If the sides is equal (==) to 4 the Pen Colour will be Blue and the Fill Colour will be gold.

If the sides is equal (==) to 5 the Pen Colour will be Red and the Fill Colour will be Green.

Else:

Pen Colour will be Black and the Fill Colour will be Yellow.

Task 4 – Extension

Create your own program using the Python Turtle. You must include the following:

- **Variables – User to be prompted to enter their answers**
- **Print Statements**
- **IF or Nested Conditions**
- **For Loops**

Plenary – Refer to the Lesson Objectives

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Understand how to create and save programs in Python.

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Understand the use of printing statements and joining variables

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 data have you input into the programs?