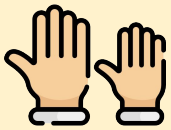
Lesson 1 & 2 - Python Turtle Instructions

Learning Outcomes:

- Learning some python basics
- Learning how for loops work by making shapes
- Making a shape making app



REMEMBER: Put up your hand. We love to help!

Python Turtle - Simple Instructions

We're going to get things going by experimenting with a few turtle functions to draw shapes. Pictured right are the functions we'll be using and what they mean.

turtle.forward	Go forward
turtle.backward	Go backward
turtle.right	Turn right
turtle.left	Turn left
turtle.penup()	Lifts the pen up so you can move the turtle without drawing
turtle.pendown()	Drops the pen back onto the screen so you can draw
turtle.fillcolor("Brown")	Changes the fill colour to brown(or other colour)
turtle.pencolor("Red")	Changes the pen colour to red (or other colour)
turtle.begin_fill()	Begins to fill the shape
turtle.end_fill()	End the filling sequence

trinket ▶ Run ? Modules

main.py

```
#!/bin/python3
import turtle
turtle.fillcolor("Brown")
turtle.begin_fill()
turtle.pencolor("Red")
turtle.forward (100)
turtle.right (90)
turtle.forward (100)
turtle.right (90)
turtle.forward (100)
turtle.right (90)
turtle.forward (100)
turtle.end_fill()
```

1. CTRL + Click this link www.taoc.ie/py1
2. Complete tasks 1-7 making all shapes as required

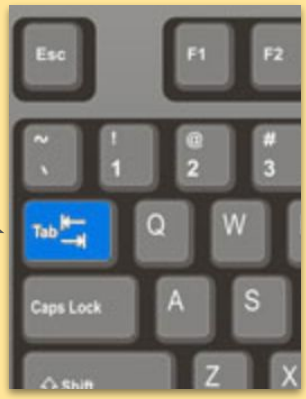
For Loops I

Writing out the same instructions many times is not very efficient. We're going to use **for loops** to write instruction in the form of a loop. The code on the right must be **indented** – this is important – it tells the program that these lines are to be repeated inside the loop.

```
#!/bin/python3
import turtle
for i in range(4):
  turtle.forward(100)
  turtle.right(90)
```

This indentation can be done in two ways:

- With two spaces
- By pressing the **Tab** button (shown here in blue)



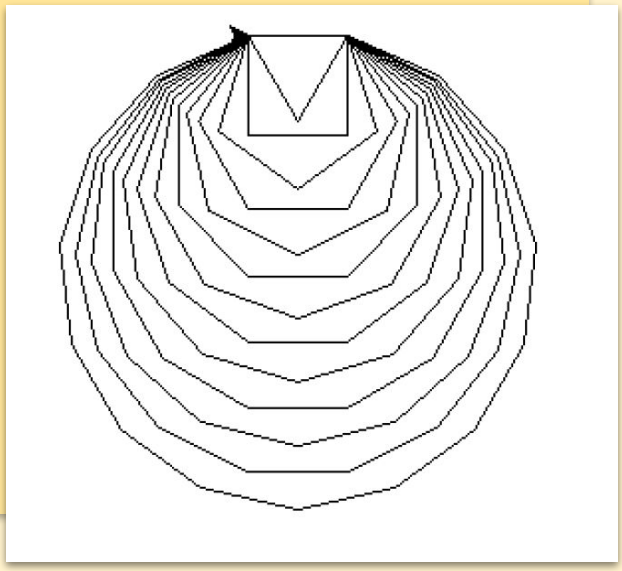
Complete the rest of the tasks on:

www.taoc.ie/py1

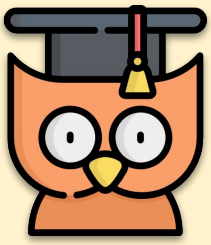
Lesson 2 - For Loops II

We're going to get more practice with For Loops by making a 'Shape Maker' drawing app. Users will be asked what features they would like to see on their shapes and the turtle will the draw out the shape.

Complete all of the tasks on: www.taoc.ie/py2

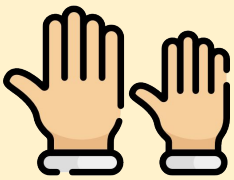


Lesson 3 - Python Project III - “Py” Charts



Learning Outcomes:

- Creating pie charts and bar graph from collected data (depending on venue)



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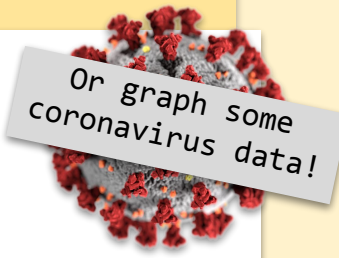
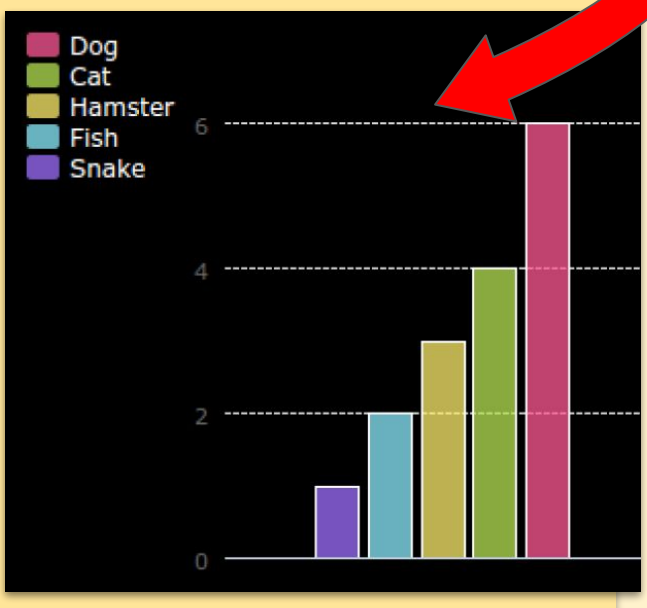
Collect Your Data

We’re going to create Pie and Bar charts based on data that you collect. Take 2 minutes to make a list of data about people's favourite pets, bands, games consoles or whatever you wish. Obviously, when we’re working online it may be a little tricky so you can use the data on the right if you want. Write out a list and make sure everyone’s favourite is included! If you don’t have a chance to collect data, you can use this example on the right.

Dog 6
Cat 4
Hamster 3
Fish 2
Snake 1





1. Open up this blank template: www.taoc.ie/pychart

2. We’re going to import a library called PyGal which will do a lot of the hard work for us. **Import** the library by putting the following code in your document: `import pygal`

Using PyGal

3 Let's make a pie chart and display it. Type in the code on the right, but don't worry, it will get more interesting!

```
import pygal

piechart = pygal.Pie()
piechart.render()
```

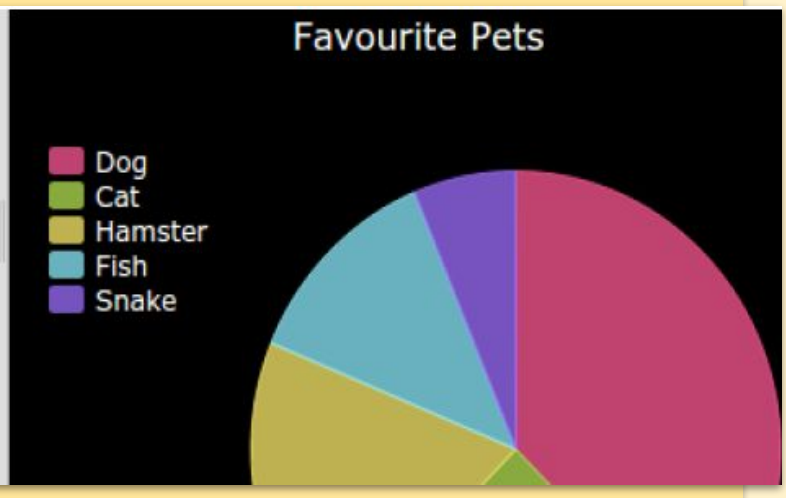
4 Next, we're going to add the data for all of our animals, games or whatever you collected. Remember, if you don't have any data, use the example on the previous page.

```
import pygal

piechart = pygal.Pie()
piechart.add('Dog', 6)
piechart.add('Cat', 4)
piechart.add('Hamster', 3)
piechart.add('Fish', 2)
piechart.add('Snake', 1)
piechart.render()
```

5 Lasty, add a title to your code:

```
piechart = pygal.Pie()
piechart.title = 'Favourite Pets'
piechart.add('Dog', 6)
piechart.add('Cat', 4)
piechart.add('Hamster', 3)
piechart.add('Fish', 2)
piechart.add('Snake', 1)
piechart.render()
```



Extra Challenge - Bar Charts

Collect more data and create a bar chart using the line `barchart = pygal.Bar()`. Follow the same pattern as above to make this. Consider asking people their favourite sport, how they get to The Academy of Code, what month their birthday is, if they like Fortnite (yes/no). The decision is yours! For more inspiration, try look at how data is represented on this site: https://coronavirus.jhu.edu/map.html This has been programmed with python!