# Python Programming Exercises

The following **Python** programming exercises will test your understanding of the programming concepts that we have covered so far on the course. Take your time in competing them, there is no prize for the fastest solution. All programs must be fully commented to show your understanding. The programs cover area, volume and perimeter of shapes, so you will need to review the formulae from GCSE maths!

Make use of **functions** in each exercise.

## Exercises

1. Write a program that asks a user to input a numeric value for the length of one side of a square. The program should output a message to the monitor that says what the area of the square is.
2. Write a program that calculates the area of a rectangle, based on the values input by a user.
3. Expand tasks 1 & 2; write a program that asks a user if they would like to calculate the area of a square or a rectangle. Depending upon which choice the user picks, the program then asks for either one or two measurements to be entered and then calculates the area of either a rectangle or a square.
4. Expand task 3 by adding the options to calculate the area of a circle.
5. Expand task 4 by adding the option to calculate the area of a triangle.
6. Now add the option to work out the perimeter of a square, rectangle, triangle and circle.
7. Now add the option to work out the volume of a cuboid, cylinder and prism.
8. The following data is used by a supermarket that offers discounts to different aged customers:

|  |  |
| --- | --- |
| **Age in years** | **Discount** |
| Under 18 | No discount |
| 18 – 24 | 2.5% |
| 25 – 31 | 1.9% |
| 32 – 39 | 1.5% |
| 40 – 54 | 1.7% |
| 55 – 64 | 2% |
| 65 – 99 | 3% |

Write a program that asks a user to enter their age, depending upon the value typed in, they are informed of the store discount they would receive if they signed up to the loyalty card scheme.

1. Text

   Description automatically generated  
     
   Text

   Description automatically generated  
     
   A company has come to you with a problem, can you figure out what the code is doing and why the last test is failing.  
     
   Fix the code and write a comprehensive list of tests to prove that your new function works.