General Instructions

Make sure that you read and then follow the instructions for each task carefully.

Please make sure that you save all of your work to a safe place and that you make **regular back-ups**.

You should begin all tasks with the following steps unless otherwise stated:

- Create a new Python file with the *Project Name* specified in the file.
- It is suggested that you save the file with your completed code (and/or any other files specified) in a folder named for the tutorial week (*week01, week02,* etc.), which should itself be in a root folder called *sdam*. However, you can use whatever method you wish to organise your work – just make sure that each file can be located quickly and efficiently based on the week number and the project name.

 If you are in any doubt, please check with your tutor.

Time Flies
Project Name: time_flies

Beginner   Write a program that prompts the user to enter their age and then outputs

- their current age,
- their age before their last Birthday and
- their age after their next Birthday.

Step 1: Create a new subfolder called *week02* within your *sdam* folder.

Step 2: Create a file called *time_flies.py* in your *week02* folder.

Step 3: Get the user's age

- Create a suitable user prompt using *input()* to get the user's age
- Store this value in an appropriate variable as follows:

```
age = int(input("Please enter your age: "))
```

Step 4: Write the output statements

- Calculate and output ages
- The first two outputs could be:

```
print("Current age is: " + str(age))
print("Age before last birthday was: " + str(age - 1))
```

- Complete the outputs

Step 5: Run the program

- Run the program and make sure that you get an output that has all the functionality and outputs required
- Save your project.

Step 6: Take a screenshot

- Take a screenshot of the running program and paste it into Paint
- Save the image as *time_flies.jpg* in your *week02* folder.

Portfolio   The task contribution to your portfolio is:

- The Python source code file *time_flies.py*

- *time_flies.jpg*

Address
Project Name: address

Beginner	Write a program to prompt the user to input a surname, an integer house number, a road name and a town on separate lines and output it formatted as an address as follows:

```
Mr and Mrs <surname>,
<house number>, <road name>
<town>
```

where the actual data replaces the words inside the angle brackets. So, for example:

```
Mr and Mrs Windsor,
1, The Mall
London
```

Step 1: Write source code

- write the code necessary to prompt the user for the data, then output the data using a using a single *print()* function containing the correct formatting

Step 2: Run and test your application

- run the program several times with different sets of data and ensure that the output is as expected

Step 3: Take a screen shot of the output

- take a screenshot of the formatted output
- save the screenshot in your project folder as *address.jpg*

Portfolio	The task contribution to your portfolio is:

- The Python source code file for the task
- *address.jpg* showing output from *address.py*

Cuboid
Project Name: cuboid

Beginner	Write a program to calculate and output the surface area and volume of a cuboid. The program should prompt the user for positive integers representing the width, length and height of the cuboid.

Assume that all data entered is valid.

Step 1: Create a Python file

- Create a new Python file called *cuboid.py* in your *week02* folder.

Step 2: Write source code

- Your source code will need to:
  - Get user input for width, height and length as integers
  - Calculate and output the surface area (https://goo.gl/awJVoj)
  - Calculate and output the volume of the cuboid (https://goo.gl/aSAfFN)

        o   Test your solution with the following data:
- width = 8
- length = 6
- height = 5

Surface area should be 236
Volume should be 240

Step 3: Run and test your application

Run the program several times with different sets of data and ensure that the output is as expected

Run the program with the following data:

- width = 21
- length = 15
- height = 6

Step 4: Take a screen shot of the output

- Take a screenshot of the running program and past it into Paint
- Save the image as *cuboid.jpg* in your *week02* folder.

Portfolio	The task contribution to your portfolio is:

- The Python source code file for the project
- *cuboid.jpg*

Shopping List
Project Name: weekly_shop

Intermediate	Write a program that prompts for the amount and the price of the following items:

- Peaches (one of)
- Beans (can of)
- Chicken pieces (packet of)
- Socks (pair of)
- Bottle of water

Your program should then calculate and output the total cost and the number of items purchased.

An example of the output that is expected is:

```
Peaches
-how many? 2
-price? 0.6
Beans
-how many? 3
-price? 0.5
Chicken pieces
-how many? 4
-price? 2.65
Socks
-how many? 5
-price? 1.25
Bottle of water
-how many? 1
```

-price? 0.8
Total number of items purchased: 15
Your weekly shop cost: 20.35

Save your file in your *week02* folder as *weekly_shop.py*

Take a screenshot of the finished output and save it as *weekly_shop.jpg*

Portfolio	The task contribution to your portfolio is:
	• The Python source code file for the project • *weekly_shop.jpg*

Distance Calculator
Project Name: distance_calculator

Intermediate	Write a program that calculates the distance travelled by an object moving with constant acceleration.
	The formula you will need to perform the calculation is:
	$$s = ut + \frac{1}{2}at^2$$
	where
	$s =$ distance $u =$ initial velocity $t =$ time taken $a =$ acceleration
	Your program should prompt the user for values for *u*, *t* and *a*. Assume the units for input as being metres per second (m/s), seconds and metres per second per second (m/s^2).
	Save your file in your *week02* folder as *distance_calculator.py*
	Take a screenshot of the finished output and save it as *distance_calculator.jpg*. Make sure that you have tested your output to ensure that it is correct.

Portfolio	The task contribution to your portfolio is:
	• The Python source code file for the project • *distance_calculator.jpg*

Cost of Living
Project Name: cost_of_living

Intermediate	Write a program to prompt the user for the following data for monthly costs:
	• Rent • Gas • Electricity • Water • Council tax
	Assume that the maximum value to be entered will be 9999.99 and that all values entered will be positive.

Your program will then output these costs and a total in a formatted table:

Step 1: Write source code

- Write the code necessary to prompt the user for the data, then output the data in the table format required using print().

Step 2: Run and test your application

- Run the program several times with different sets of data and ensure that the output is as expected

Step 3: Take a screen shot of the output

- Take a screenshot of the formatted output
- Save the screenshot in your project folder as *cost_of_living.jpg*

Portfolio	The task contribution to your portfolio is:

- The Python source code file for the task
- *cost_of_living.jpg* showing output from *cost_of_living.jpg*

A matter of time
Project Name: seconds

Expert	Write a program to prompt the user for a positive integer number of seconds and output the number of hours, minutes and seconds that it represents.

For example, if the number of seconds input is 3793, the data should be formatted as follows:

Input	Hours	Minutes	Seconds
3793	1	3	13

Take a screen shot of the finished output saved as *seconds.jpg*.

Portfolio	The task contribution to your portfolio is:

- The Python source code file for the task
- *seconds.jpg*

All portfolio requirements for this tutorial

Beginner	*time_flies.jpg*

time_flies.py

address.jpg

address.py

	cuboid.jpg	
	cuboid.py	6
Intermediate (opt)	*weekly_shop.jpg*	
	weekly_shop.py	
	distance_calculator.jpg	
	distance_calculator.py	
	cost_of_living.jpg	
	cost_of_living.py	
Expert (opt)	*seconds.jpg*	
	seconds.py	