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.

Reversal
Project Name: reverse_list_output

Beginner	Write a program to prompt the user for 5 integers and store them in a list. After the last integer has been input, the program should print the inputted integers out in reverse order. You must use a loop to perform the reversal and not, for example, converting the number to a string and *slicing*. Write and test your program with different sets of test values. When complete test your program with 1, 2, 3, 4, 5. Take a screen shot of the output and save it as a file in your project folder called *reverse.jpg*.
Portfolio	The task contribution to your portfolio is: • The Python source code file for the task • *reverse.jpg* showing output from *reverse.py* when tested

Colourful
Project Name: rainbow

Beginner	Write a program that stores the colours of the rainbow in order in an list. The program will then continually prompt the user to enter an integer from 1 to 7 or -1 to end the program. When the user enters an integer between 1 and7 it will output the corresponding colour from the rainbow. For example if the user enters 3 your program should output Yellow. Write and test your program ensuring you test all 7 values and the exit value. If you are unsure about the colours of the rainbow you can follow this link: https://www.metoffice.gov.uk/learning/rainbows/colours-of-the-rainbow. When complete test your program with 7, 6, 5, 4, 3, 2, 1, -1. Take a screen shot of the output (you may need to increase the size of the output window to capture all 8 inputs and responses) and save it as a file in your project folder called *rainbow.jpg*.
Portfolio	The task contribution to your portfolio is:

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

A blast from the past
Project Name: pairs

Intermediate

Write a program that contains a 2 dimensional String list with 4 rows and 4 columns. Populate the list as follows: You have 16 cards, 4 Jacks, 4 Queens, 4 Kings, 4 Aces. place them anywhere you like within the list. Your program will then display the cards 'face down', use any character you like to representthe 'rear' of the card (e.g. *) so your initial grid would look like:

```
  0 1 2 3
0 * * * *
1 * * * *
2 * * * *
3 * * * *
```

Your program will then prompt the use to enter a card position by specifying the row position followed by the column position (e.g. 1 2 for row 1 column 2). Your program will then display the card at that position and prompt the user for a second card position.

If the cards are a matching pair (e.g. both Jacks) your program will output a suitable message. If they are not a matching pair your program will output something suitably conciliatory.

If the cards are a matching pair, the two positions in the game grid will be filled with an X to show those cards have gone. For example suppose position 0 2 and 3 3 both contained Aces correctly selected by the user:

```
  0 1 2 3
0 * * X *
1 * * * *
2 * * * *
3 * * * X
```

The user must not be able to input the position of card that has already been successfully paired!

The game will continue until the user has paired all of the cards, your program will then output the number of pairs of selections the user made before completing the grid.

Write and test your program ensuring you use a suitable set of test data.

When complete test your program with following a pair of inputs that do not produce a match and a pair of inputs that complete the game and display the total number of selections made. Take a screen shot of the output of each test and save them as files in your project folder the first called *pair_no_match.jpg* and the second called *pair_match.jpg*.

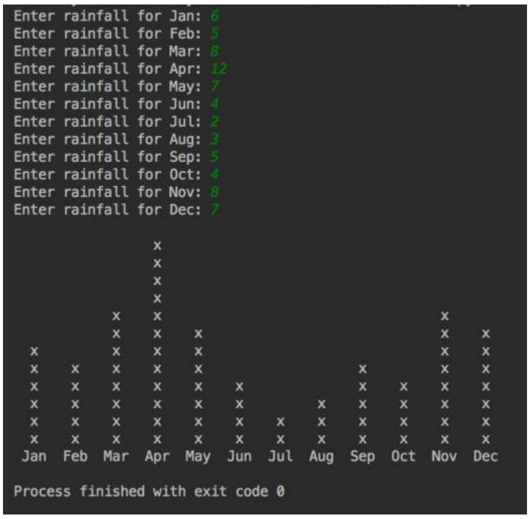
Portfolio	The task contribution to your portfolio is: • The Python source code file for the task • *pair_no_match*.jpg and *pair_match.jpg* showing output from *pair_match.py* when tested

It never rains but it pours
Project Name: rainfall

Expert

Write a program that prompts the user for the rainfall (in millimetres) for every month of the year. When your program has collected the data it should print out the results as a histogram.

Using the code from the lecture complete the Rainfall application so that it produces the histogram as illustrated below.



```
Enter rainfall for Jan: 6
Enter rainfall for Feb: 5
Enter rainfall for Mar: 8
Enter rainfall for Apr: 12
Enter rainfall for May: 7
Enter rainfall for Jun: 4
Enter rainfall for Jul: 2
Enter rainfall for Aug: 3
Enter rainfall for Sep: 5
Enter rainfall for Oct: 4
Enter rainfall for Nov: 8
Enter rainfall for Dec: 7

                x
                x
                x
                x
           x    x                                  x
           x    x    x                             x    x
 x         x    x    x                             x    x
 x    x    x    x    x                   x         x    x
 x    x    x    x    x    x              x    x    x    x
 x    x    x    x    x    x         x    x    x    x    x
 x    x    x    x    x    x    x    x    x    x    x    x
 x    x    x    x    x    x    x    x    x    x    x    x
Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct  Nov  Dec

Process finished with exit code 0
```

When complete test your program with suitable data. Take a screen shot of the output and save it as a file in your project folder called *rainfall.jpg.*

Portfolio	The task contribution to your portfolio is: • The Python source code file for the task • *rainfall.jpg* showing output from *rainfall.py* when tested

All portfolio requirements for this tutorial

Beginner	*reverse.jpg* *reverse.py* *rainbow.jpg* *rainbow.py*
Intermediate (opt)	*pair_no_match.jpg* *pair_match.jpg* *pair_match.py*
Expert (opt)	*rainfall.jpg* *rainfall.py*