Introduction to Computer Programming

Exercises - Week 11: Review

Week 2

Exercise 1 - Variable types

1. Cast an integer variable with value 8 as
   (a) a floating point number.
   (b) a boolean value.

Exercise 2 - Strings

1. Assign a few words or a short sentence a variable, `my_reason_for_learning_python` then print it.

Exercise 3 - Lists

1. Use a built-in python function to print the length of the list `[2, 3, 4, 5]`
   (a) Edit the list to add the number 6 to the end of the list
   (b) Edit the list to add the number 1 to the beginning of the list

Exercise 4 - Control flow

1. Write a program that prints the numbers from 1 to 50, inclusive, and:
   - skips multiples of three
   - prints `"Multiple of 5"` instead of multiples of five
   - prints `"!"` instead of multiples of both three and five

Week 3

Exercise 5 - Data structures

1. Print the largest number from a list, seperated by commas, input by the user.
2. Create a dictionary with key (x), value (x^2) pairs for x = integers 1 to 5.
3. Print the 4th element of the tuple `("red", "green", "blue", "pink", "gold")` using its index.

Exercise 6 - Loops

1. Use a for loop to print each student and grade stored as the following two loops:
   - students = `["Jay", "Kip", "Laura"]`
   - grades = `[66, 52, 76]`

   in the format `student : grade (e.g. Jay : 66)`
2. Use a for loop to reverse a string

Week 4

Exercise 7 - Functions

1. Write a function calculation() that accepts two variables, calculates:
   (a) the sum of two variables
   (b) division of first variable by second variable and then returns both a) and b) in a single return call.

   Call your function and assign a) and b) to two seperate global variables
2. Create a function `showStudent()` in such a way that it should accept student name, and their mark out of 100 and display both, but of the mark is missing in the function call it should show it as `"absent"`

Week 5

Exercise 8 - Classes

1. Create a `Student` class and initialize it with name and student number. Write methods:
   - `display` - display all information currently held about the student
   - `setAge` - assign an age to student
   - `setMarks` - assign a mark out of 100 to the student

Week 6

Exercise 9 - Writing files

1. Write your answer to Exercise 8 to a .txt file.

Exercise 10 - Command line and importing python files

1. Store the function you wrote for Exercise 11 in a file funcs.py
   Call the function in another program main.py
   Run main.py from the command line

Week 7

Exercise 11 - Numpy

1. Create the numpy array:
   ```
   [[24, 22, 20, 18]
   [16, 14, 12, 10]
   [8, 6, 4, 2]]
   ```
   Multiply:

- 1st column by 2
- 2nd column by 3
- 3rd column by 4
- 4th column by 5

Week 8

Exercise 12 - Matplotlib

1. Plot a bar chart of the students and their grades in Exercise 8