MA1008 Introduction to Computational Thinking
Week 6 Programming: String

There are more questions here than you can do in the class hour. Attempt as many as you can in class, and do the rest outside of class. Remember the rule: always work out the algorithm first before you start coding. Write it out on paper if it helps.

1. Write a program that would prompt for a string and then print the ASCII value of each character in the string.

2. Write a program that prints the multiplication table between 1 to 12 in a neat table.

3. Write a program that reads in a word and prints `True` if the word contains all the vowels and `False` otherwise.

4. Write a program that prompts for a sentence and then output the number of (1) words, (2) upper case letters, (3) lower case letters, (4) digits, and (5) other characters. (Words are strings separated by white spaces.)

5. An encryption system uses the following rules:
   (1) A letter, upper case or lower case, is replaced by a letter of the same case five places up the alphabet. If this falls pass the end of the alphabets, it is wrapped round to the beginning. So “b” becomes “g”, and “y” becomes “d”.
   (2) A digit is replaced by a digit larger by 3. If this is greater than 9, it is wrapped round to the other end. So 3 becomes 6, and 8 becomes 1.
   (3) All other characters remain unchanged.

   Write a program that reads in a string of characters and produces the encrypted string according to the above rules.

6. Write a program to read in a Python variable and print `"Valid"` if it is a valid Python variable and `"Invalid"` otherwise. For this exercise, you can assume that Python keywords do not exist, i.e. you don’t have to check against them.

7. Write a program to calculate the circumference and area of a circle given the radius, and output the results in the format as in this example:
   ```
   Radius of circle = 10.00, circumference = 62.83, area = 314.16
   ```
   Note that all the numbers have a fixed number of decimal places, and no redundant spaces before the number.