CSC061 Lab Class 7 Monday 09/11/2020

□ Task 7.1

Write a program which prints the numbers 10 to 1 (inclusive) using a **for** loop.

Hint: This can be done very easily using a for loop with an appropriate step value.

Once you have done this, **extend** your program to print all the even numbers from 2 to 20 (inclusive), using a for loop.

□ Task 7.2

Write a program which asks the user to enter a series of integers (one after another). The program should keep asking for integers until the user types 0 (zero). Once the user has typed 0 the program should output the number of even numbers and the number of odd numbers that were entered (ignoring the 0).

Hint: Use the code:

```
x % 2 == 0
```

to test if a number is even. The result will be `True` if `x` is even and `False` if `x` is odd.

□ Task 7.3

Write a program which asks the user to enter a single string. The program should output the number of vowels in the string.

Hint: Vowels are the letters a, e, i, o, and u.

Hint: Loop over the string, inspecting each character as you go. If the character is a vowel then increment a counter. Once you have looped over the entire string, then you can exit the loop and print the value of the counter.

□ Task 7.4

Write a program which simulates tossing a coin 10 times. You can do this by having a for loop which:

1. Generates a either a zero or a 1 randomly, i.e., generates a random integer between 0 and 1 inclusive.
2. If the number is 0, then print "Heads", if the number is 1 then print "Tails".

Hint: See the mini-tutorial at the end of this lab sheet for information about generating random numbers.

□ Challenge Task 7.5

Write a program which asks the user to enter a series of sentences. The program should keep asking for sentences until user types ”” (the empty string, i.e., they just press enter). Once the user has typed ”” the program should output the total number of vowels that were entered and the total number of consonants.

Hint: You will need a nested loop.

□ Challenge Task 7.6

Write a program that asks the user to enter some positive integer n (greater than or equal to 1).

The program should print the pattern:

```
    1
   212
  32123
 4321234
543212345
```

The height of the pattern should be n. That is, the above pattern is printed when n is 5. The above pattern would be one row higher if n was 6.

Mini-tutorial: Random Numbers

Random numbers can be generated in Python using the library function `randint`. This function needs to be imported from the `random` library. It takes as parameters two values, the first being the lower bound and the second being the upper bound. The function returns a value between the lower and upper bounds (inclusively).

For example:

```
from random import randint

x = randint(5,10)
print(x)
```

This code first imports the `randint` function. It then calls it with a lower bound of 5 and an upper bound of 10. The `randint` call will return a random value between 5 and 10 (inclusively). This value will then be bound to the variable `x`. Finally, this value will be printed. Each time this program is run you will get a different value printed (unless you are very very unlucky and `randint` always picks the same number).