CSC1015F Assignment 4: Control (if, for, while)

Assignment Instructions

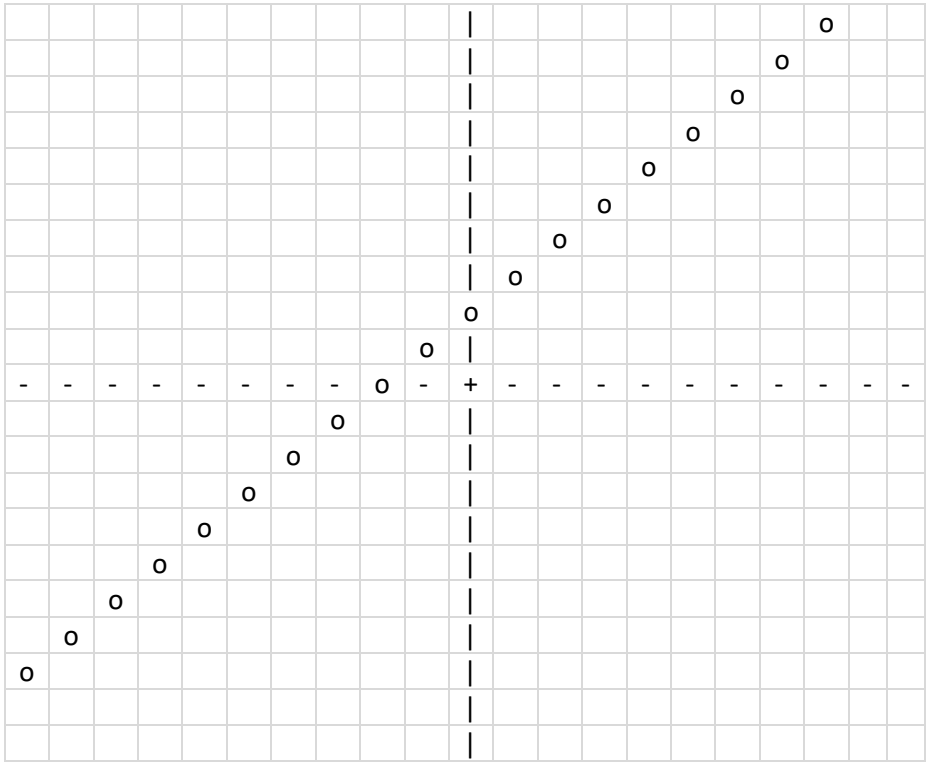
This assignment involves constructing Python programs that use input and output statements, '`if`' and '`if-else`' control flow statements, '`while`' statements, and statements that perform numerical manipulation.

(Note that you don't have to attempt questions in the order in which they are presented on the assignment sheet. You should do what works best for you!)

Question 1 [50 marks]

Write a program called *graph.py* that asks the user to enter a mathematical function, $f(x)$, and draws a text-based graphing of it.

For example, say $f(x) = x + 2$, the program would print this graph:



Use axis limits of -10 to 10, with only discrete points plotted. Use nested loops to scan through the entire area of the graph and wherever the (rounded) value of f(x) is equal to the y, output 'o' (small letter Oh). Otherwise, output either the appropriate axis character or a space.

HINT:

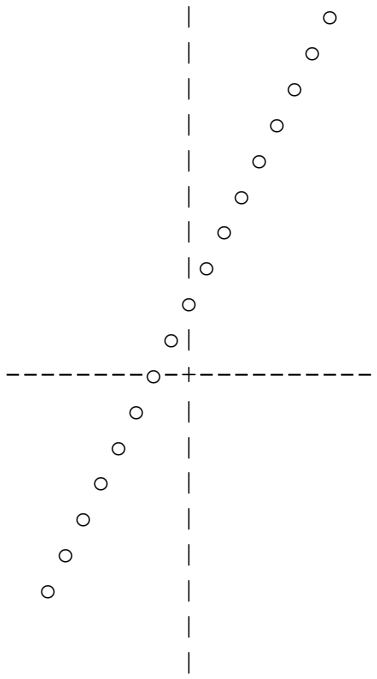
> Use the `eval()` function e.g. the following code outputs `9.42477796076938`.
>
> ```
> s = '3*math.pi'
> print(eval(s))
> ```

- Remember to import math to be able to use mathematical functions.

Continued

Sample I/O (user input in bold):

```
Enter a function f(x):
x+2
```



Question 2 [50 marks]

Write a program called *vending.py* that simulates a vending machine with respect to calculating change based on the amount paid.

The program will accept as input the cost of the item purchased, and will prompt the user to add money until the cost is met/exceeded. It will then calculate and print the change.

Assume that payments and change are given in R50, R20, R10, R5, R2, and R1 amounts.

Sample IO:

```
Enter the cost (in Rand):
21
Deposit a coin or note (in Rand):
10
Deposit a coin or note (in Rand):
20
Your change is:
1 x R5
2 x R2
```

NOTE: The program will calculate the minimum number of coins to give while making change.

Submission

Create and submit a Zip file called '`ABCXYZ123.zip`' (where ABCXYZ123 is YOUR student number) containing `graph.py` and `vending.py`.

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