New York University

CSC-101 Intro To Programming

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Intro To Programming Mock Midterm

March 24, 2024

Instructions

You have 1 h 30 minutes to go through all the questions. You cannot use IDE or any environment. Please answer all the questions on a Google Doc file.

Part A: Predict The Output (10 marks)

Predict the output for each program unless there is an error. If there is an error, then please state which lines will raise errors.

1.
```
1. for i in range(6,0,-1):
2.         for j in range(i,0,-1):
3.                 print(“*”, end=“”)
4.         print(“”)
```

2.
```
1. for i in range(10):
2.         if i%2==0:
3.                 print(i)
```

3.
```
1. N=50
2. i=1
3. while i<=50:
4.         if 50%i==0:
5.                 print(i)
6.         i+=1
```

4.
```
1. num1=10
2. num2=6
3. result=num1ˆnum2
4. print(result)
```

5.
```
1. num1=bin(10)
2. num2=bin(6)
3. print(num1ˆnum2)
```

Part B: True or False (20 Marks)

Statement if the following statements are True or False. Justify your answers.

1. “complex=3+2j” is an invalid assignment operation in Python.
2. print(bin(2)+bin(3)) produces the following output 0b10100b11
3. In Python there are no Boolean datatype.
4. A for loop can be used to iterate over characters in a string.
5. Check the following lines of code:

   ```
   flag=0
   while flag:
           print(“This will be an infinite loop”)
   ```

   The output of this line will be an infinite loop displaying “This will be an infinite loop” on the console.
6. Check the following lines of code:

   ```
   while True:
         i=1
         if i==10:
               break
         i+=1
   ```

   The while loop will execute exactly 9 times and on the 10 iteration i==10, and the break statement will break out the program from the while loop.
7. Characters are primitive data types in Python.
8. No variable in Python can be named “true” because it is a reserved keyword for the Boolean type “true”
9. In range(start, stop, steps), the start argument must always be smaller than stop.
10. Let str be a string variable. To index str, the index must always be a positive integer between 0 to one less than the length of str. For example, str[-1] will throw an exception.

Part 3: Writing Programs (40 Marks)

1. Write a program that accepts three positive integers from the user. Then it produces all the common factors and displays them line by line on the console.

2. Write a program that accepts a positive integer, N, from the user. You need to find all the odd number in the range [0,N) and print them out line by line. You are not allowed to use the modulai operator or any if and else statement to output the results.

3. Write a program that accepts a positive integer n from the user and produces the following pattern on the console. In the given example , $n = 5$.

```
    *
   **
  ***
 ****
*****
```

   More explanation will be provided in class so if the pattern seems unclear do not worry.

4. Write a program that accepts a string from the user. Then the program must count the number of vowels present in the given string. It must output: “ There are * insert number of vowels* vowels in the word *insert user input*””. To keep matters simple, the input string is guaranteed to be lowercase.

BONUS

Write a program that accepts two strings from the users and stores them in string1 and string2 variable. The program must check if all the letters of string1 appears in string2. If so, it must output :“All letters of string1 appear in string2”. Otherwise, the the program must output, “Not all the letters of string1 appear in string2”. For example, string1=“car” and string2=“cartoon”. Then the output should be, ” “All letters of string1 appear in string2”. Now, if string1=‘cartoon”, and string2=“car” then the output will be, “Not all the letters of string1 appear in string2”. For simplicity you can assume there will be no spaces, special characters, or numbers.