**Lab 6: More if-else, if-elif-else, and loops**

**Objective:**

The objective is to practice the concepts of conditionals and repetitions in Python.

**Questions:**

**1.** What output occurs for the following program on the given input?

int\_str = **input**("Please give me an integer:")

first\_int = **int**(int\_str)

int\_str = **input**("Please give me a second integer:")

second\_int = **int**(int\_str)

tens\_count = 0

loop\_count = 0

**while** first\_int > 10 **and** second\_int < 20:

**if** first\_int == 10 **or** second\_int == 10:

tens\_count += 1

first\_int -= 5

second\_int += 5

loop\_count += 1

**print**(tens\_count) # Line 1

**print**(loop\_count) # Line 2

**print**(first\_int) # Line 3

**print**(second\_int) # Line 4

(a) Given user input of 20 followed by an input of 10, what value is output by:

i. Line 1 of the program? - 1

ii. Line 2 of the program? - 2

iii. Line 3 of the program? - 10

iv. Line 4 of the program? - 20

(b) Given user input of 20 followed by an input of 20, what value is output by:

i. Line 1 of the program? - 0

ii. Line 2 of the program? - 0

iii. Line 3 of the program? - 20

iv. Line 4 of the program? - 20

(c) What input will cause both first int and second int to be equal to 10

at the end of the program? – first\_int = 15, second\_int = 5

**2**. Write a FOR loop that will iterate from 0 to 20. For each iteration, it will check if the current number is even or odd, and report that to the screen (e.g. "1 is odd, 2 is even").

count=0  
for i in range(1,20):  
 if i % 2 == 0:  
 print(i,"is even")  
 else:  
 print(i, "is odd")

**3.**

(a) Write a FOR loop that will iterate from 0 to 10. For each iteration of the loop, it will multiply the number by 9 and print the result (e.g. "2 \* 9 = 18").

for i in range (0,10):  
 num\_multi = i \* 9  
 print(i,"\* 9 = ",num\_multi)

(b) Use a nested loop to show the tables for every multiplier from 1 to 10 (100 results total).

for i in range (0,10):  
 for x in range(1,11):  
 num\_multi = i \* x  
 print(i,"\*", x,"=",num\_multi)

**4**. Write a program to calculate and print the factorial of a number using a FOR loop. The factorial of a number is the product of all integers up to and including that number, so the factorial of 4 is 4\*3\*2\*1= 24

x = int(input("Enter an integer to calculate its factorial: "))  
count = 1  
  
for i in range(1,x+1):  
 count \*= i  
 #print(i, "\*", i-1, "=",count)  
  
final\_fact = count  
print("The factorial of",x,"is:",final\_fact)

**5.** What output occurs for the following program on the given input?

number\_str = **input**("Enter an int:")

number = **int**(number\_str)

count = 0

**while** number > 0:

**if** number % 2 == 0:

number = number // 2

**elif** number % 3 == 0:

number = number // 3

**else**: # Line 1

number = number - 1 # Line 2

count = count + 1

**print**("Count is: ",count) # Line 3

**print**("Number is: ",number) # Line 4

(a) Given user input of 9, what value does Line 3 of the program print? - 3

(b) Given user input of 9, what value does Line 4 of the program print? - 0

(c) Given user input of 7, what value does Line 3 of the program print? - 4

(d) Given user input of 1, what value does Line 3 of the program print? - 1

(e) If the else clause on Line 1 and Line 2 were removed, what effect would

that have on the program with the input value 1? – The program gets stuck in the while loop indefinitely.

i. No effect; program would give the same results.

ii. The count would be larger.

iii. The count would be smaller.

iv. The while loop would not end.

v. None of the above.

**6.** Ask the user to enter a number and print it back on the screen. Keep asking for a new number until they enter a negative number.

user\_num = int(input("Please enter a number: "))  
while user\_num >= 0:  
 user\_num = int(input("Please enter a number: "))  
print("Well done, you figured out how to escape the hell that is this program! (By entering a negative number)")

**7.** Write a program that uses loops to print the triangle below

*Hint 1*: you will need to use nested loops.

*Hint 2:* on line 1 we print 1 \*, on line 2 we print 2 stars… on line x we print x stars…)

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star = ""  
for i in range(1,6):  
 star += "\*"  
 print(star)