National University of Computer and Emerging Sciences

School of Computing **Fall 2016** **Islamabad Campus**

CS101
Introduction to Computing

Monday, September 26, 2016

Course Instructor

Sibt ul Hussain, Amna Irum,
Atifa Sarwar, Aneequa Sundus

Serial No:

Mid I

Total Time: 1 Hour

Total Marks: 80

_____
Signature of Invigilator

_____ _____ _____ _____

Student Name Roll No Section Signature

DO NOT OPEN THE QUESTION BOOK OR START UNTIL INSTRUCTED.

Instructions:

1. Attempt on question paper. Attempt all of them. Read the question carefully, understand the question, and then attempt it.
2. Please read the complete paper before attempting any question and manage your time intelligently.
3. No additional sheet will be provided for rough work. Use the back of the pages for rough work.
4. If you need more space write on the back side of the paper and clearly mark question and part number etc.
5. After asked to commence the exam, please verify that you have ten (**10**) different printed pages including this title page. There are total of **5** questions.
6. Use permanent ink pens only. Any part done using soft pencil will not be marked and cannot be claimed for rechecking. Make a smiley on front page and earn four bonus marks.
7. Use **proper indentation** while writing code and make sure that your code is legible. Failing to do so can cost you marks.

	Q-1	Q-2	Q-3	Q-4	Q-5	**Total**
Marks Obtained						
Total Marks	25	25	10	10	10	**80**

Vetted By: _____Vetter Signature: _____

25

Q. No. 1

(a). For each expression at left, indicate its value in the right column. List a value of appropriate type. e.g., 7 for an integer, 7.0 for a real, "hello" for a String, True or False for a boolean or write error if there is any.

10

Expression	Value
14/3 + 17 * 4 **1 % 7	
not (5/7 < 1) or 7*4 and 5+19.5 < 30	
7 == 7 / 5 * 5 + 7 % 5	
"ABBC" + "DEF"*2	
11 > 7 + 6 or 3 * 2 <= 39 % 10 == True	

(b) For each run and input below, write the output that is produced.

```
num=int(input("Enter an Integer:"))
x = 2;
y = 32;
while num < y :
    y = y/10 + x
    x = y - 5
    print ("Output ", x, " ",y)
```

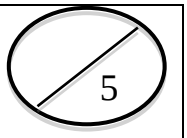
Dry run:

5

Run 1:	**Run 2:**
Enter an Integer: -10 Output:	Enter an Integer: 21 Output:

c) What is the output of the following pseudo code:

```
a = input('Enter a Number: ')
b = input('Enter another Number: ')
if (a % b == 0):
    a = a / b
if (a < b):
    b = b - a
elif (b % 2 == 0):
    b = b / 2
else:
    a = a - b
print a, " ", b
```



Runs	Outputs
Input for Run1: Enter a Number: 2	**Output of Run1:**
Input for Run2: Enter a Number:5	**Output of Run2:**
Input for Run3: Enter a Number:28	**Output of Run3**

25

Q. No. 2

a. Write if-else (conditional statements) for following situation. Given two integer variables a and b, print True if any one of a and b is negative and other one is positive, or both are negatives. Else print False.

3

b) Write if-else (conditional statements) for following situation. Given an integer variable a, print True if a is 10 units away from 100 or 200.[Hint: Check in both directions]

2

c) Write if-else (conditional statements) for following situation. Given two variables a and b, print their sum unless the two values are the same, then print double their sum.

2

5

Write a Python program to check a triangle is valid or not. [Hint: Use the Triangle Inequality Theorem, which states that the sum of two side lengths of a triangle is always greater than the third side. If this is true for all three combinations of added side lengths, then you will have a triangle.]

Expected Output:

Input the length of side1: 5

Input the length of side2: 4

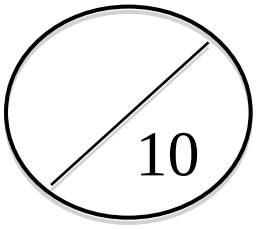
Input the length of side3: 6

The triangle is valid.

Write a while loop that displays following pattern

= 1 = = 2 = = = 3 = = = = 4 = = = = = 5

a) Write a while loop that displays the following sequence: 1, 4, 2, 6, 3, 8, 4, 10, 5, 12



Q. No. 3 Write code to calculate sum of an harmonic series. Your code should take a parameter n as input and should print the sum of the first n reciprocals. In other words:

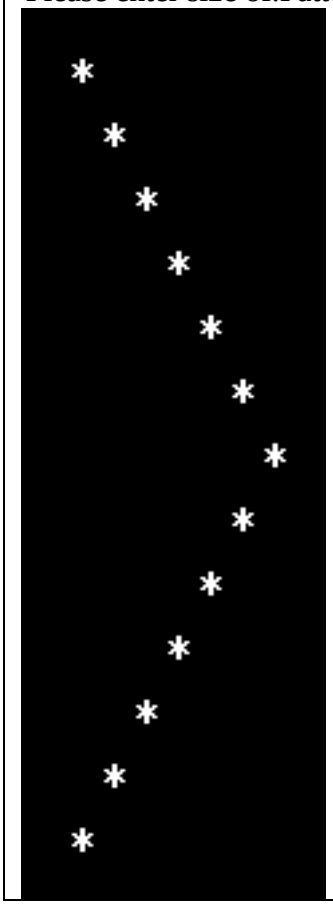
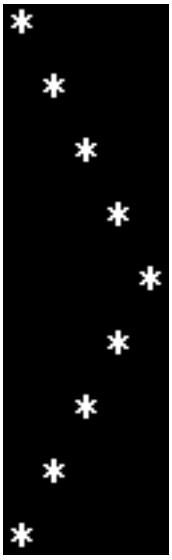
HS(n)= (1 + 1/2 + 1/3 + 1/4 + ... + 1/n)

For example, for n=2 your code should print the value 1.5 ,i.e. (1 + 1/2). If input value is 0, it should print 0.0 as its result. You may assume that user will never enter a negative value.

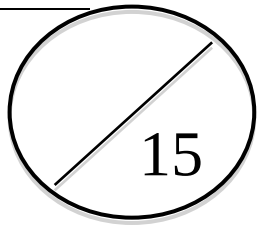
Q. No. 4 Write the code (using a loop) that takes size of pattern as input (this will be always an odd number) and prints a pattern of that size using '*' characters**.**
Note you are only allowed to use a single loop.

15

For example:

Please enter size of.Pattern: 7 	Pease enter size of.Pattern: 5 

Q. No. 5



Write a program that simulates a snail trying to crawl up a building of height 6 steps. The snail starts on the ground, at height 0. In each iteration, the snail either crawls up one step, or slips off one step and falls all the way back to the ground. In each iteration you would take a number as input from user and if the number is less 50 than the snail will slip otherwise it will crawl up. The program should keep going until the snail gets to the top of the building. It should then print out the number of falls that the snail took before it finally reached the top.
Here is a sample execution:
Iteration 1: Please enter a number between [1,100]: 60
Snail Moved: Up
Iteration 2: Please enter a number between [1,100]: 60
Snail Moved: Up
Iteration 2: Please enter a number between [1,100]: 40
Snail Moved: Down

Number of falls: 8