CS100 Computational Problem Solving
Fall 2019-20
Section 1
Saturday, 24 September 2019

Lab 04: Exercise

Lab Guidelines

1. Make sure you get your work graded before the lab time ends.
2. You put all your work into the folder **Lab4_YourRollNo_TAname** and submit it on LMS (Assignment>Lab3) before the time the lab ends.
3. Talking to each other is NOT permitted. If you have a question, ask the lab assistants.
4. The object is not simply to get the job done, but to get it done in the way that is asked for in the lab.
5. Phone is NOT allowed. Put it in bag or at instructor desk.
6. Any cheating case will be reported to Disciplinary Committee without any delay.

Coding Conventions:

1. Constants are ALL_CAPS.
2. Variables are all_small.
3. All curly brackets defining a block must be vertically aligned.

Learning Objective:

1. PO-02 Develop proficiency in the practice of computing.
2. CO-02 To help students analyze and solve programming problems
3. LO-02 Critical Thinking and Analysis
4. LO-03 Problem Solving
5. LO-05 Responsibility

Marks: Name: _____ Roll #: _____

Task1	Q1	Q2							Total
	10	10							20

Task2									Total
									20

Task 3									Total
									20

Task 4	Q1	Q2							Total
	20	20							40

Total Marks Obtained

/100

TA: _____

Let’s Begin

Task 1: [20 marks]

Part A: [10 marks]

Ali buys stationary for his CS-100 quiz. He buys 2 pens for 15 cents each and a calculator for 10 dollars. The store offers a 23% discount on the calculator. Calculate the total bill that Ali needs to pay.

Ali has different types of currency notes i.e 10, 5 and 1 dollar notes. Find the number and type of currency notes that Ali can give to exactly pay his bill.

Hint: Use type cast to convert between data types.

Part B: [10 marks]

Solve the following equation:

$$((2.25*8)2-\sqrt[2]{73-9})\%(2.15+7.5-4.65))3$$

Hint:

- Try breaking the equation into 2 parts to get around the issue of using float with %.
- **pow** and **sqrt** functions may be helpful for this computation. If you use then don't forget to include *cmath* library for this

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Task 2: [20 marks]

All of you must have seen some datasets online at some point in time. Write a program that gives output similar to the dataset below. Use functions of <iomanip> for the formatting and simply display the table using cout statements. (Ignore column lines and colours in the table)

2017 Best Selling Groups Digitally			
No.	**Group**	**Downloads**	**Songs**
1	TWICE	5,852,532	29 songs
2	BTS	5,740,304	26 songs
3	Red Velvet	4,636,773	23 songs
4	Wanna One	3,680,632	12 songs
5	EXO	3,242,448	34 songs
6	BLACKPINK	3,111,018	3 songs
7	MAMAMOO	2,750,656	8 songs
8	WINNER	2,572,682	4 songs

Task 3: [20 marks]

First of all initialize a constant named “pie” of type double, with the value 3.1415 and then write some *cout* statements to print the output as shown below:

```
...         3...
...       3.1...
...      3.14...
...     3.142...
...    3.1415...
...   3.14150...
...  3.141500...
... 3.1415000...
...3.14150000...
```

NOTE:

- You are not allowed to hard code anything.
- You are not allowed to initialize any other variable/constant.

Task 4: [20 marks]

Part A: [20 marks]

Write a Program that takes any string input from the user and interchanges the first and second half of the string with each other. For example, the input is 1000 and the program outputs 0010. Make sure your program works on any string and not just the example above.

Part B: [20 marks]

Write a program which asks the user to enter a string and then an index. The program should remove the character present at that index of the string and replace it with some other string. The other string should also be asked from the user.

Note:

- The index is just an integer that refers to the location of the ith character in the string, where i is the index. Remember indexes start from 0.
- For the sake of convenience, you should input the strings **without any spaces**.

Sample output (Part B):

```
Enter your phrase: iliketorave
Enter the index: 7
Enter string you want to replace with: beh
Output: iliketobehave
```
