CS100 Computational Problem Solving
Fall 2019-20
Section 1
Tuesday, 01 October 2019

Lab 05: 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 **Lab5_YourRollNo_TAname** and submit it on LMS (Assignment>Lab5) 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									Total
									25

Task2									Total
									25

Task 3									Total
									25

Task 4									Total
									25

Total Marks Obtained

/100

TA: _____

Let's Begin

Task 1: [25 marks]

Write a C++ program that takes in 4 real numbers and prints the largest amongst them onto the screen. Make sure that your program works correctly for both negative and positive integers.

Note: Use of loops in this section is prohibited.

```
Enter First number: 4.4
Enter Second number: 4.3
Enter Third number: -7.6
Enter Fourth number: 3

The largest of 4.4, 4.3,-7.6 and 3 is 4.4
```

Task 2: [25 marks]

Using the concepts of C++, develop an application that calculates the area and volume of the following geometric shapes.

Sphere

$$Area = 4\pi r^2$$

$$Volume = \frac{4}{3}\pi r^3$$

Cylinder

$$Area = 2\pi rh + 2\pi r^2$$

$$Volume = \pi r^2 h$$

Right Circular Cone

$$Area = \pi r\left(r + \sqrt{h^2 + r^2}\right)$$

Note: In the above formulas, ***r*** is the radius and ***h*** is the height.

Your program should have a menu displaying all the features/functions it has, to the user. Ask the user to choose a geometric shape and then ask the relevant information needed to compute the area and volume of that shape. Then finally display the results on the screen.

The program should print an error message if the user chooses a shape other than the mentioned ones.

Task 3: **[25 marks]**

Write a program that reads in the name and salary of an employee. Here the salary means an hourly wage, such as $9.25 per hour. Then the program should ask how many hours the employee worked in the past week. Be sure to accept fractional hours. Any overtime work (over 40 hours per week) is paid at 150 percent of the regular wage. Compute the pay. Print a paycheck for the employee.

Task 4: **[25 marks]**

Write a program to read any date (ddmmyy) in the form 241019 (in an integer variable) and displays it back along with the month name as 24 October 2019.
You should check for errors in the date format. For example, if the month number exceeds 12 or day number exceeds 31 or if the length of the date (i.e integer's value) is not correct. Assume every month has 31 days in it. 020219 is the same as 20219 and both are correct.

Example errors include 123112,1234, -120319
