CS 200 Lab 13 Spring 2018

Introduction to Programming

(CS200)

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C++ Programming

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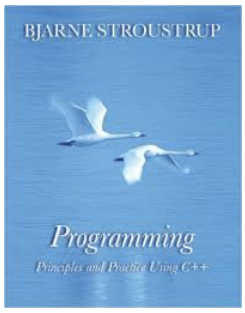

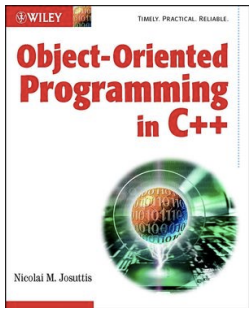

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Lab Guidelines

1. Make sure you get your work graded before the lab time ends.
2. You put all your work onto the LMS folder designated for the lab (i.e. “Lab10”) before the time of 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. Any cheating case will be reported to Disciplinary Committee without any delay.

NOTE: **Define a class interface separately and its methods separately. Do not write inline code.**

Marks: Name: _____ Roll #: _____

Task 1	1	2						Total
	10	10						20

Task 2	1	2	3	4				Total
	5	5	5	5				20

Task 3	1	2	3					Total
	10	10	10					30

Task 4	1	2	3					Total
	10	10	10					30

Let’s Begin……

Total marks Obtained

/100

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Task 1: **(20)**

A. Write a function that takes an array of integers, its size and a value. The function uses recursion to perform a linear search for the value in the array and returns true if the value is found, otherwise returns false. 10

B. Write a function that uses recursion and takes an integer as a parameter to return its number of digits. 10

STOP AND SHOW YOUR WORK TO THE TA

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Task 2: **(20)**

A. Define a Person class. 5
B. Create a multiset to hold pointers to person objects. 5
C. Define the multiset with the *comparePersons* function object, so it will be sorted automatically by names of person. 5
D. Define a half-dozen persons, put them in the multiset, and display its contents. 5

Note: Several of the persons should have the same name, to verify that multiset stores multiple object with the same key.

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Task 3: **(30)**

A. Define a class to store a binary tree. 10
Define its constructor(s), destructor, setters, getters, and other utility functions (such as search function) that may be needed.

B. Write a main program that reads in integer, double, or string data from the user and
   a. Creates a binary tree. (Input is terminated when user inputs a value -1). 10
   b. Asks user to enter a value to search and searches it in the binary tree already constructed. If found prints the message "The value [VALUE] found", otherwise prints the message "The value [VALUE] not found". 10

Hint:
- Use templates (function/class) to read in integer, double or string data.
- Make sure that the data is appropriately read. That is, an integer is stored as an integer and not as a string, and vice versa.

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Task 4: **(30)**

A. Create an error class that has three types of exception handling, int, float and string. 10
   Create User defined exceptions in error class that will be derived by user class to check the following conditions and throw the exception if the criterion does not meet.
   a. User has age between 18 and 55.
   b. User stays has income between Rs. 50,000 – Rs. 1,00,000 per month.
   c. User stays in Lahore/Karachi/Islamabad/Faisalabad.
   d. User has 4 wheel drive (4WD).

B. Create a user class (derived from error class) that has age, income, location and car as attributes. 10

C. Write a main that accepts age, Income, City, Vehicle from the user and checks for the conditions mentioned above. If any of the condition is not met it throws the exception. 10

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Zip your tasks into one folder with format:

YourRollNo-Lab13

Example "**2001001-Lab13**" and upload on LMS before the tab is closed.

You will not be given extra time.