CS 200 Lab 09 Spring 2018

Introduction to Programming

(CS200)

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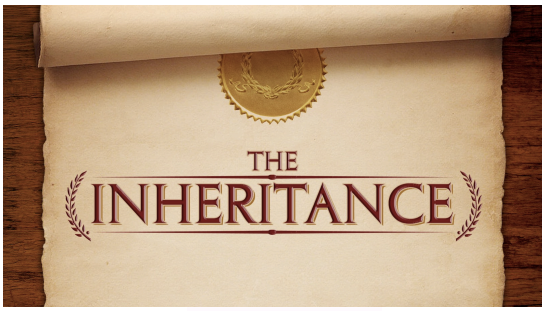
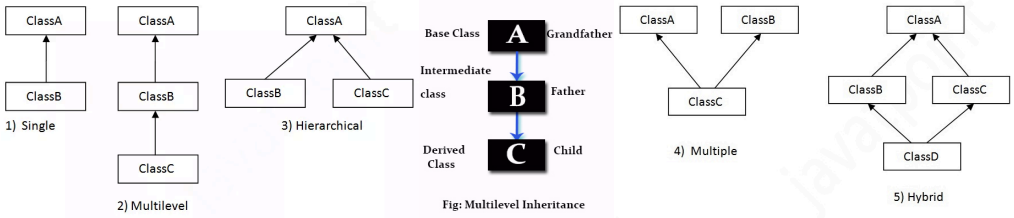
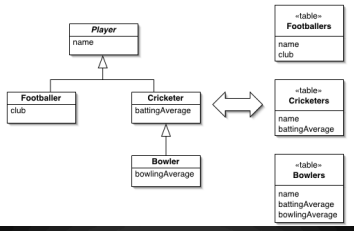
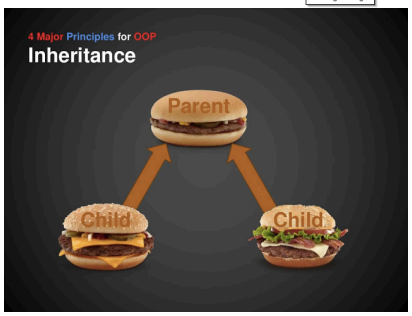
Inheritance

06-April-2018









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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. “Lab05”) 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	3	4	5	6	7	Total
	5	5	5	5	5	5	10	40

Task 2	1	2	3	4	5	6		Total
	5	5	5	5	5	5		30

Task 2	7	8	9	10	11	12		Total
	5	5	5	5	5	5		30

Let’s Begin……

Total marks Obtained

/100

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Task 1: **(40)**

Imagine a publishing company that markets both hardcopy books and audiobook versions of its works.

1. Create a class *Publication* that stores the *title* (a string) and *price* (type float) of a publication (as its private data members). 5
2. From this class derive a classe *Book*, which adds a *page_count* (type int). 5
3. Also derive a class *AudioBook*, which adds a *playing_time* in minutes (type float). 5
4. Each of these three classes should have a *default constructor* (initializing all data members with a constant value). 5
5. Each of these classes also must have *parameterized constructor* (initializing all data members with the values passed as arguments). 5
   Note: The constructors in the derived class should call the appropriate constructor of the base class.
6. Each of these classes must also have a *destructor*, which displays the data member values of an object before destroying that object. 5
7. Write a *main()* program which creates objects of each derived class dynamically, manipulates their data, and then deletes them. 10
   Note the sequence of constructor and destructor calls.

STOP AND SHOW YOUR WORK TO THE TA

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Task 2: **(60)**

Write a program to support basic functions of a hospital.

1. Write a class **Person** that stores name (First, Last), gender (M/F), and age (years) of a person. Use appropriate data types to declare name, gender, and age member functions. 5
2. Write a class **Date** that stores day of week, day, month and year. 5
3. Derive a class **Student** from Person class that stores date of admission, cgpa and level (undergraduate, graduate) of a student. 5
4. Derive a class **Employee** from Person class that stores date of joining, department (anesthesiology, cardiology, orthodontic, dermatology, endocrinology, pediatrics, etc.) and salary (between a range of PKR 200K to 800K) of an employee. 5
5. Derive a class **Doctor** from Employee class that stores doctor's specialty (anesthesiologist, cardiologist, dentist, dermatologist, endocrinologist, pediatrician, etc.). 5
6. Derive a class **Patient** from Person class that stores patient ID (an integer), date of admission, date of discharge, ward type (medical, surgery), bed number, billed amount (PKR), and doctor treating the patient. 5

Write default constructors, parametric constructors, setter functions, getter functions, display functions, and any other utility functions that you may think are necessary to execute the tasks.

Note: All derived classes are to inherit from base class using public inheritance.

The *main()* program shall:

7. admit at least 2 graduate students 5
8. hire at least 3 doctors, assign them department, salary, and specialty 5
9. admit at least 4 patients 5
10. assign a doctor to a patient for treatment 5
11. prepare the bill 5
12. discharge 2 patients whose bills have been paid 5

STOP AND SHOW YOUR WORK TO THE TA

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Zip your tasks into one folder with format:
YourRollNo-Lab09
example "**2001001-Lab09**" and upload on LMS before the tab is closed. You will not be given extra time.