

Dear students, find out your assignment 1,2 and 3. This chapter includes chapter 2,3 and 4. Each assignment includes 2 marks i.e (total 6 marks) .Student must be able to answer the question regarding assignment they have submitted. If you have any queries regarding assignment or any subject matter feel free to ask me.

Assignment -1

(2 marks)

Chapter-2

Theory

1. Differentiate between class and structure. Explain them with example.
What sorts of shortcomings of structure are addressed by classes? Explain giving appropriate example.
2. Explain the various access specifiers used in C++ with an example.
3. What is data hiding? How do you achieve data hiding in C++? Explain with suitable program.
4. What is encapsulation? How can encapsulation enforced in C++? Explain with suitable example code.
5. What are the common typed of function available in C++? Define the 3 common types of functions in C++ with a program.
6. Does friend function violate the data hiding? Explain briefly.
7. "Friend function breaches the encapsulation." Justify. Also mention the use of friend function. List out merits and demerits of friend function.
8. Private data and function of a class cannot be accessed from outside function. Explain how is it possible to access them with reference of an example.
9. What is inline function? Explain its importance with the help of example program.
10. What are the static data member and static member functions? Show their significance giving examples.
11. Write short notes on:
 - Reference variable
 - Default argument

Program

1. Define a class to represent a bank account .Include the following

Data members.

- Name of the depositor
- Account number
- Type of account
- Balance amount in the account

Member functions

- To assign initial values
- To deposit an amount
- To withdraw an amount after checking the balance
- To display name and balance.

Write a main program to test the program.

2. Create a class Employee with data members (id, name, Post, address, salary) and read information of 20 Employees and display the name and post of employee whose salary is greater than 50000.
3. Using class write a program that receives inputs principle amount, time and rate. Keeping rate 12% as the default argument, calculate simple interest for five customers.
4. WAP to perform addition of two times using friend function.
5. WAP to perform addition of two complex numbers using friend function.
6. WAP to swap contents of two variables of 2 different classes using friend function.
7. Create classes called Vechile1, Vechile2 and Vechile3 with each of having one private member named price. Add member function to set a price(say setPrice()) one each class. Add one more function max() that is friendly to all classes. max() function should compare private member named price of three classes and show maximum among them. Create one-one object of each class and then set a value on them. Display the maximum price among them.

Assignment -2

(2 marks)

Chapter-3

1. What is message passing? Describe with example.
2. Differentiate message passing and procedure call with suitable example. What are the possible memory errors in programming.
3. Explain message passing formalism with syntax in C++. What is stack Vs heap memory allocation?
4. "A constructor is a special member function that automatically initializes the objects of its class", support this statement with a program of all types of constructors. Also enlist the characters of constructors.
5. What is constructor? Is it mandatory to use constructor in class. Explain.
6. What is copy constructor in C++? Is it possible to pass object as argument in Copy constructor? Explain with suitable program.
7. Differentiate between constructor and destructor. Can there be more than one destructor in a program for destroying a same object. Illustrate your answer.
8. What are constructors and destructors? Explain their types and uses with good illustrative example? What difference would be experienced if the features of constructors and destructors were not available in C++.
9. What is de-constructor? can you have two destructors in a class? Give example to support your reason.
10. Discuss the various situations when a Copy constructor is automatically invoked. How a default constructor can be equivalent to a constructor having default arguments.
11. What do you mean by dynamic constructor? Explain its application by a program to compute complex numbers.
12. What is dynamic memory allocation? How memory is allocated and de-allocated in C++? Explain with examples. List out the advantages of dynamic memory allocation? Explain with suitable example.

Programs

1. Write a Program to add two complex number using the concept of Constructor.
2. Create a class Mountain with data members name, height, location, a constructor that initializes the members to the values passed it to its parameters, a function called CmpHeight() to compare two objects and Displnf() to display the information of mountain. In main create two objects of the class mountain and print the information of the mountain which is greatest height.

3. Create a class time constructor having hour, minute and second as an arguments is use to take two time data from user. The add function that takes two class objects an arguments add them respectively then display the aggregate result?
(Apply 60 second =1 minutes and 60 minutes =1 hour)
4. Create a class named Height with data members feet and inches. In main function create two objects of class Height. Initialize one object using parametrized constructor and copy this values to another object. Now finally perform the addition between these two objects.
5. WAP to add two distances given in km and m using dynamic constructor.
6. WAP to input marks of 35 students and find the highest marks using Dynamic memory allocation.

Assignment -3

(2 marks)

Chapter-4

1. "Inheritance allows us to create a hierarchy of classes. Justify this statement. Discuss private and public inheritance.
2. How does visibility mode control the access of members in the derived class? Explain with an example.
3. Why protected access specifier used in C++? Explain different types of inheritance with examples.
4. How does inheritance support reusability? What are the different forms of inheritance? Explain with example.
5. When base class and derived class have the same function name what happens when derived class object calls the function?
6. Inheritance supports characteristic of OOP. Justify your answer. Explain ambiguity that occurs in multiple inheritance.
7. During the time of hybrid inheritance when there is hierarchical inheritance at the upper level and multiple inheritance at lower level, ambiguity occurs due to the duplication of data from multiple path at the grand child class. How this kind of ambiguity is resolved? Explain with suitable example?
8. How are arguments are sent to base constructors in multiple inheritance? Who is responsibility of it
9. How does inheritance influence working of constructors and destructors? Class 'Y' has been derived from class 'X' .The class 'Y' does not contain any data members of its own. Does the class 'Y' require constructors? If yes why.

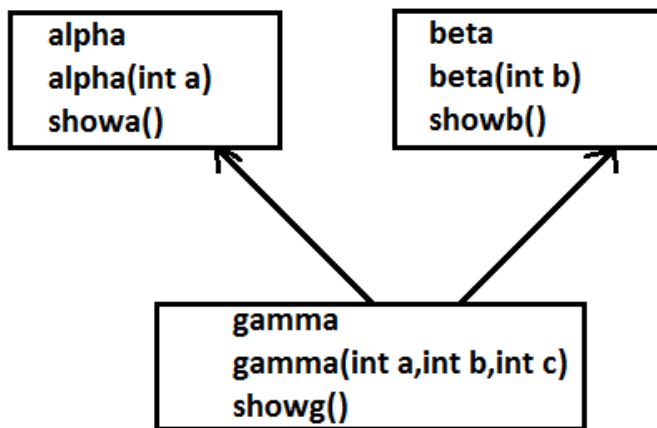
10. What is containership? How does it differ from inheritance, describe how an object of a class that contain object of another classes are created.
How composition differs from inheritance?
11. Explain how composition provide reusability?
12. Distinguish between subclass and subtype in light of principle of substitutability.
Support your answer with suitable example.

Differentiate between

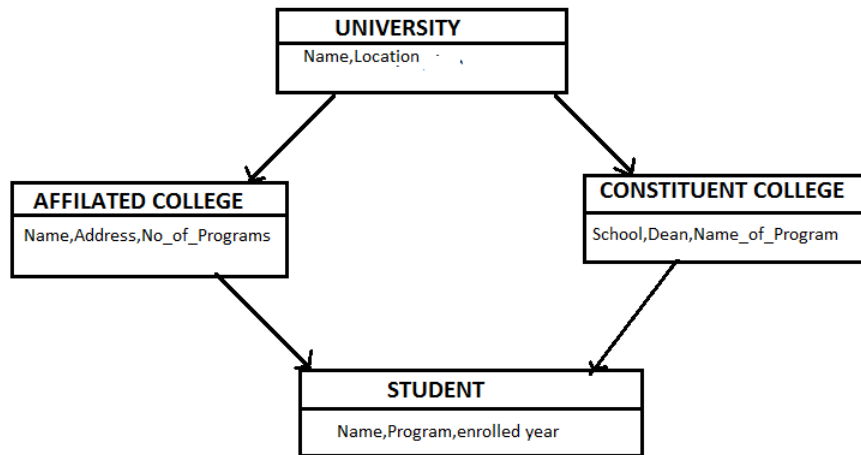
- subclass and subtype.
- Is a rule and has a rule
- Software reusability
- Generalization

Programs

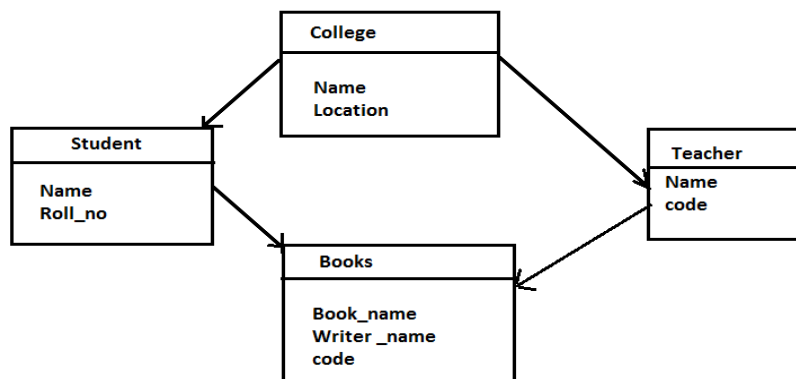
- 1) WAP to enter information of n Employee and then display is using the concept multiple inheritance.
- 2) Write a complete program with reference to the given figure.



- 3) The following figure shows the minimum information required for each class. Write a program by realizing the necessary member functions to read and display information of individual object. Every class should contain at least one constructor and should be inherited from other classes as well.



- 4) The following figure shows the minimum information required for each class. Write a program to realize the above program with necessary member functions to create the database and retrieve individual information. Every class should contain at least one constructor and should be inherited to other classes as well.

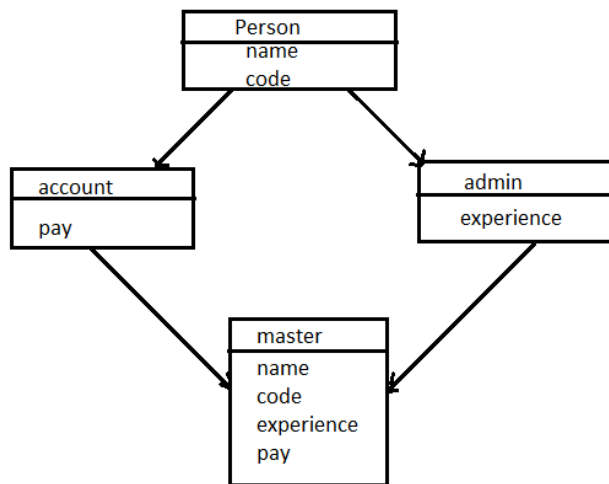


- 5) Create a class called **Person** with suitable data members to represent their name and age. Use member function to initialize and display these information. Derive **Student** and **Employee** from the **Person** class with their unique features. Initialize object of these class using constructor and display the information.
- 6) Write a program to input two vector coordinates from the base class named "Base". Class "Derived" inherits all the properties of class "Base". Class "Derived" must contain a function named `add_vector()` that add the two vectors input from the base class and finally display the result from the function `display()` that is friend to the base class.

7) Create a class student with two data members represent name and age. Use appropriate member function to read and print these data members name and roll. Derive a class marks from student that has additional data member sessional1,sessional2 to store sessional marks. Derive another class result from marks and add the sessional marks. Use appropriate member function to read and display data in the class.

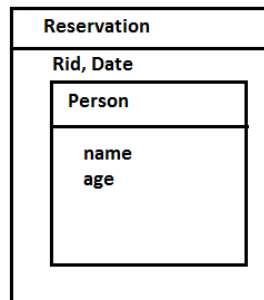
8) Create a class student with two data members to represent name and age. Use member function to read and print those data. From this derive a class called boarder with member data to represent room number .Derive another class called day-scholar from class student with member data to represent address of student. In both derived class use function to read and print respective data.

9)The following figure shows minimum information required for each class.

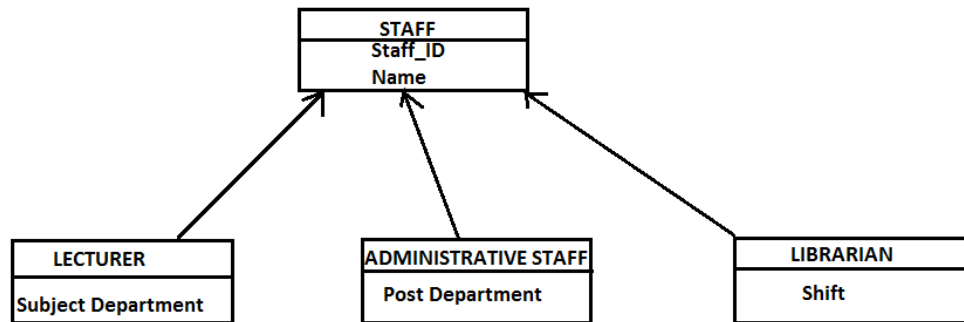


- Write a Program to realize the above program with necessary member functions to create the database and retrieve individual information
- Rewrite the above program using constructor on each class to initialize the data members.

10) Write a program that allow you to book a ticket for person and use two classes Person, Reservation. Class Reservation is composite class/ container class.



11) Develop a complete program for an institution, which wishes to maintain a database of its staff. The database is divided into number of classes whose hierarchical relationship is shown in the following diagram. specify all classes and define constructors and functions to create database and retrieve the individual information as per requirements.



12) Develop a complete program for an institution which wishes to maintain a database of its staff. Declare a base class STAFF which include staff_id and name. Now develop a records for the following staffs with the given information below.

Lecturer (subject, department)

Administrative staff (Post, department)