1. i) Write a java program to create an abstract class named Shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that each class extends the class Shape. Each class contains only the method printArea() that prints the area of the given shape. Also show and demonstrate the difference between overriding and overloading.

ii) Implement a Java program using IO stream classes that takes blank-space separated data (one record per line, assume data – name, roll-number, mark, grade) from a text file and inserts this record into another text file if line number is even.

1. i) Demonstrate how to use data member and methods in multilevel inheritance by applying various access controls (all access modifier and non-access modifiers) and access this data member and methods in or outside the class.

ii) Write a Java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number

1. i) Write a Java Program to define a class, describe its constructor, overload the Constructors and instantiate its object. Also demonstrate how to use inner static and non-static classes in defined class and in other external class.

ii) Write a Java Program to implement all types of inheritance with their access modifiers and demonstrate use of method overriding.

1. i) Implement a JAVA program to demonstrate database CURD operation.

ii) Assume you are implementing JAVA based application for OLA cab organization. The organization authority provide requirement – 1) main class contain functionality- INQUIRY for availability SUV and SEDAN type, TAKE-ON-RENT, ESTIMATE/CHECK FARE and FEEDBACK. 2) For inquiry class contain take information for user and show available vehicle with type. 3) For TAKE-ON-RENT, its ask user for vehicle with driver or without driver. In both case methods contain its own local class and it takes information from user. 4) FEEDBACK is only allowed for valid customer based on unique class identity generated for each customer.

1. Suppose you are crating JAVA based student admission software for Walchand College of Engineering Sangli. From user or student software ask information about – name, JEE Mark, 12th standard mark, 10th standard mark. The college authority said to developer, there is no duplication in student record (assume name field is unique) and records are arranged in decreasing order of JEE Mark, 12th standard mark, 10th standard mark. Implement above situation using suitable collection framework, comparable and comparator interface.
2. i) Demonstrate how to use static data member and static method, non-static data member and non-static method, in static method and non-static method, static and non-static class. Also Display Hello world on console without creating any object and writing any code in main method.

ii) Implement simple arithmetic calculator using GUI programming.

1. i) Implement JAVA program to demonstrate how we will get following error/exception in program- a) cannot assign value to variable, b) cannot override method, c) cannot subclass the class.

ii) Write a Java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number.

1. i) Using JAVA program demonstrates abstract keyword with method and user defined class. Also demonstrate what is/are the illegal non access specifiers/modifiers combinations and in output, print why this combination is illegal.

ii) Write a JAVA program to create login application. If login is successful then display user information else display message as “wrong username or password”.

1. i) Demonstrate how you are using access and non-access specifier/modifiers for solving following problem.

Problem statement - Assume that the bank maintains two kinds of account of its customers, one called saving account and the other current account. The saving account provides compound interest and withdrawal facility but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge imposed. Create a class Account that stores customer name, account number and type of account. From this class Current-Account and Saving-Account to make them more specific to their requirements. Includes necessary methods in order to achieve the following task:

a) accept deposit from customer and update balance.

b) display the balance for account

c) display banks opening and closing balance and check this balance is same after performing all transaction made on that period.

d) Compute and deposit interest.

e) Permit withdrawal and update balance

f) check for minimum balance, impose penalty if necessary and update balance.

g) create and assign system generated account number to customer.

f) check no two customer contain same details, if same mark account as duplicate and make sure that duplicate type is not allowed to change. Also delete previous account and update all details in new account.

(show use of static, final, abstract and access specifier/modifiers).

If required assume suitable data and mention your assumption in program - either in comment form or call method to print assumption on console.

1. Suppose you are implementing java based software for Walchand College Library System and suggested to use user defined classes with static, non-static inner class, anonymous class strategy for implementing different functionality.

For above scenario demonstrate different types of inner classes used for creating application and show how to access data member and methods in inner class. Also show how to access inner class method.

First draw class diagram that represents application functionality using outer class and inner class (include all types of inner classes). Assume suitable data, functionality of library system.

1. i) Suppose you are implementing application for student class with methods (only three methods) 1-getdata() for getting student required information, 2-display() for show student information and 3-estimate() for calculating student percentage based in 5 subject marks. Let application want give information about student class (what it contains and how to use class) at the time of creating student class object if user want information flag is true. (Hint: anonymous class).

ii) Write a java program to write a user input in external resource text file created through program using IO stream class.

1. i) Write a java program to extract information of file like, number of bytes available for read, skip number of bytes from input stream, check stream reading for number of times (mark and reset method).

ii) Implement a student database for CSE department such that objects, elements are arranged in order, no duplicate entries allowed. Implement above scenario using suitable collection framework that fulfils above both conditions. Also based on user choice create sub collection for SY, TY and BTECH students.

1. i) Write a java program to read content from a file and write a content to file. Suppose you are provided with buffer of size 30 bytes then how many read and write operation with given buffers are required.

ii) Write a java program for creating array structure (at the time of insertion automatically elements are arranged in increasing order) using list interface and perform all array operation.

1. i) Write a program to handle stock of a wholesale   grocery shop using interface. Maintain available stock of dairy product, wafers, vegetables, beverages separately. Check the current demand by customers and place an order if stock is not sufficient. Update the stock accordingly. Interface includes all common methods also stock information is related to interface not individual class assume that grocery shop handle only limited orders.

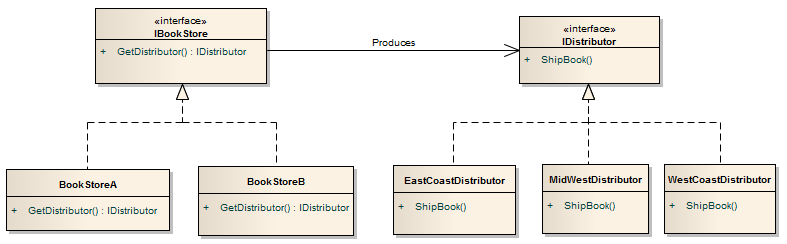
Assume required and suitable data.

1. Let’s say you own an online bookstore (IBookStore) and people come to your website to buy books. When a customer orders a book you just have another book distributor (IDistributor) send the book directly to the customer. You are a middle man and you don’t stock the books. You have many distributors that you can choose to send the books directly to your customers. Since you have many distributors, you have the following logic to determine which distributor to choose for sending the books to your customers:

If the customer is in the east coast, you will use EastCoastDistributor

If the customer is in the midwest, you will use MidWestDistributor

If the customer is in the west coast, you will use WestCoastDistributor



Implement above scenario for creating JAVA based application.

(Assume necessary data – datamember and method)

1. i) Write a java program to display file information and methods to create file, checking file is present or not, deleting file, get file name, path name, check is file or not, get file parent, modification or execution is allowed or not, last modification time, creating file directory, creating file under created directory through program with extension txt, path and file separator.

ii)   Demonstrate wait and notify for simple message printing/producer consumer problem/bank operation for single object (multiple debit and credit).

1. i) Using ArrayList class create array and perform all array operation – add, delete, search, fill, etc. Display array element result in descending order.

ii) Demonstrate wait and notify for simple message printing/producer consumer problem/bank operation for single object (multiple debit and credit).

1. Write a program to write student class state information into external resource file and to read student class state information from external resource file. Also show how different types of exception are arises during execution of file handling program. Exception - NullPointerException, IllegalArgumentException, IllegalStateException, EOFException, IndexOutOfBoundException, FileNotFoundException, SecurityException.
2. i) Consider any your choice real world application which contains static and transient data member. Read or Write number of object from/into file and show how static and transient data member are saved in external resource file.

ii) Create a user defined student class and store all student class object information into database. Also add method to retrieve required student information based in roll number. Assume suitable student class data member and methods.

1. i) Write a JAVA program to implement dynamic size student database system which includes roll number, name, branch, grade pointer. Based on user choice data member sort (use Comparable , Comparator), search student data in database, creating sub student database for equal branch. Also check how many students are on given or user choice grade.

ii) Write a program to display Thread information.

1. Write a java program for bank data database using Map interface of java collection framework. In bank costumer name may repeated with some unique constraint like first name, last name, date of birth but compulsory an account number is different. Also perform bank operation. Also display total balance available at bank open and at the time of closing bank and display all account name in descending order of available balance.

1. i) Write a java program to demonstrate comparable interface and comparator class. Distinguish two collections are different or not, based on single data member and multiple data member. Assume suitable class.

ii) Implement a synchronised thread application for banking operation – debit and credit operation.

1. i) Implement Stack and double ended Queue using interface available in JAVA. Perform its all operations using available methods (specific to stack and queue) for stack and queue in Queue and List interface.

ii) Suppose you are creating a JAVA application for OnlineShowroom for three (three java class) products 1) car, 2) truck and 3) bike. Also OnlineShowroom contains a class CustomerInfo and for this class all outer class data members are accessed with just name. When this OnlineShowroom class shows information about cars then information is only limited to current method or function. Based on available bike in OnlineShowroom, the bike information changes object to object. Consider any inner class type for truck class.

1. i) Create simple thread using Thread class and implementing Runnable class and show all information about thread like default name, priority, assign name using constructor, using setName, default priority, assign priority, call thread for execution, difference between calling thread and run method, current thread state etc. Also create multiple thread and show parent thread, child thread, their id, current state, priority, make one thread goes in sleeping state, thread is alive or not.

Also show object sharing in number of runnable thread objects. Consider bank application credit and debit.

ii) Implement java program to count number objects created from class.

1. i) Create 4 threads in java program for demonstrating the one thread gives chance to execute another thread (yield method). Also show the difference between without yield method and with yield method.

ii) Implement JAVA application and demonstrate how to traverse or move cursor/pointer in database. i.e ResultSet and its cursor movement to update particular record in database.

1. i) Create 4 thread in main function and implement this thread such that thread execution ends after exiting main thread. (join method).

ii) Implement JAVA application and demonstrate how to traverse or move cursor/pointer in database. i.e ResultSet and its cursor movement to update particular record in database.

1. i) Create calculator application such that client sends input and server implements required arithmetic operation and reply with result to client.

ii) Write a java program to read content from a file and write a content to file. suppose you are provided with buffer of size 30 bytes then how many read and write operation with given buffers are required.

1. i) Create calculator application such that client sends input and server implements required arithmetic operation and reply with result to client using RMI methodology.

ii) Suppose you want to implement ARRAYCLASS class and its all operation under CLASSPACKAGE. For implementing array you decided to create a data structure with name ARRAYOPERATION under package ARRARPACKAGE. Using this data structure performs all operations.

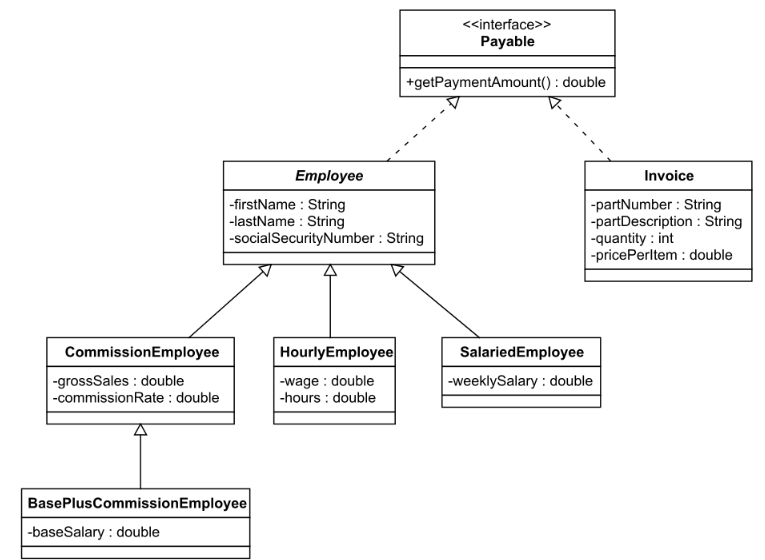
1. i) Write a java program to implement dynamic size student database system which includes roll number, name, branch, grade pointer. Based on user choice data member sort (use Comparable, Comparator), search student data in database, creating sub student database for equal branch. Also check how many students are on given or user choice grade. In application duplicate entries are not allowed (use suitable data structure). If any duplicate entry found at the time of insertion then throw duplicate entry exception.

ii) Design a java class to represent a bank account. Include the following members: Data Members- Name of the depositor, account number, type of account and balance in account. Methods - to assign initial values, to deposit an amount, to withdraw an amount after checking balance and to display account details.

1. i) Demonstrate packages in JAVA and access specifier/modifier with data member and methods. Also create a arithmetic calculator logic under one package and perform calculator operation in another package. Assume data member are not accessed outside the class.

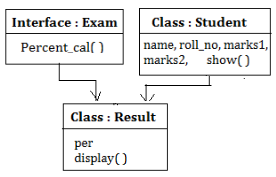
ii) Write a java program to create an abstract class named shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that classes contains only the method printArea() that prints the area of the given shape. Implement above program using interface. Also demonstrate invalid interface declaration and different errors.

1. Implement following scenario represented in diagram.



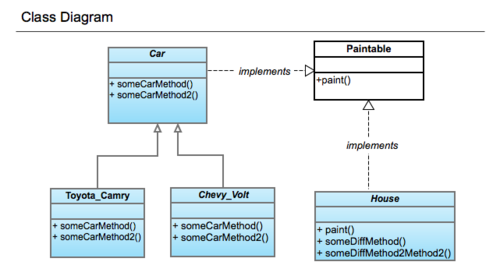
Suppose you are creating java based software SALARY application for a company. SalarySoftware class contain the main method. SalarySoftware class uses Employee as a subclass. There are three types of employee, 1) commission employee works on commission, 2) salaried employee works on weekly salary and 3) hourly employee works on clock hour basis. Each employee has a different salary. Invoice is the final document for representing final amount. If required assume suitable data.

1. i) Implement following diagram to demonstrate abstract class and interface.



ii) Create 4 thread in java program for demonstrating the one thread gives chance to execute another thread (yield method). Also shoe that thread execution ends after exiting main thread (join method). The job for the thread is to print number table and each thread prints different number table.

1. i) Implement following diagram using abstract class and interface. Assume suitable data member and methods.



ii) Write a student class details in external resource file and display required student information. Assume suitable data member and method.

1. i) Create a java based chat application using Socket programming and after sending 7 messages chat application closes connection.

ii) With suitable real world application demonstrate different types of inner classes and show how to access data member and methods in inner class. Also show how to access inner class method.

1. i) Suppose you created a data base for storing student information. After some time you realized that need to update some row from the student table. Create a java application for implementing above problem such that only particular row is updated.

ii) Write a java program to create an abstract class named shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that classes contains only the method printArea() that prints the area of the given shape.

1. i) Create an user defined object array using Arrays class. Perform all operation of array using Arrays class. (add, delete, search, modify, sort, comparing array, sub array creation (index position divisible by 2 or 7), copying array onto another array). Show how to traverse array using enumeration/iterator/enhanced loop.

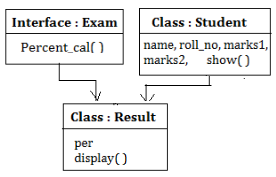
ii) Create a java based chat application using Remote Method Invocation (RMI) methodology.

1. i) Write a program to read and write primitive data type into/from external resource file.

ii)  Comparable and Comparator – write a java program to demonstrate comparable interface and comparator class. Distinguish two collections are different or not, based on single data member and multiple data member.

1. i) Demonstrate Client/Server communication (networking) in Java using sockets. Send an expression to the server using the client program. Server will solve the simple expression and send the result back to the client.

ii) Implement following diagram to demonstrate abstract class and interface.



1. i) Demonstrate how to override class method using anonymous class.

ii) Write a java program to extract information of file like checking file is present or not, get file name, path name, check is file or not, get file parent, modification or execution is allowed or not, last modification time, file directory, number of bytes available for read, skip number of bytes from input stream, check stream reading for number of times (mark and reset method).

1. i) Write a Java program to create multiple threads for different calculator operations. Use extends Thread or Implements Runnable.

ii) Write a java program to create an abstract class named shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that classes contains only the method printArea() that prints the area of the given shape. Implement above program using interface. Also demonstrate invalid interface declaration and different errors.

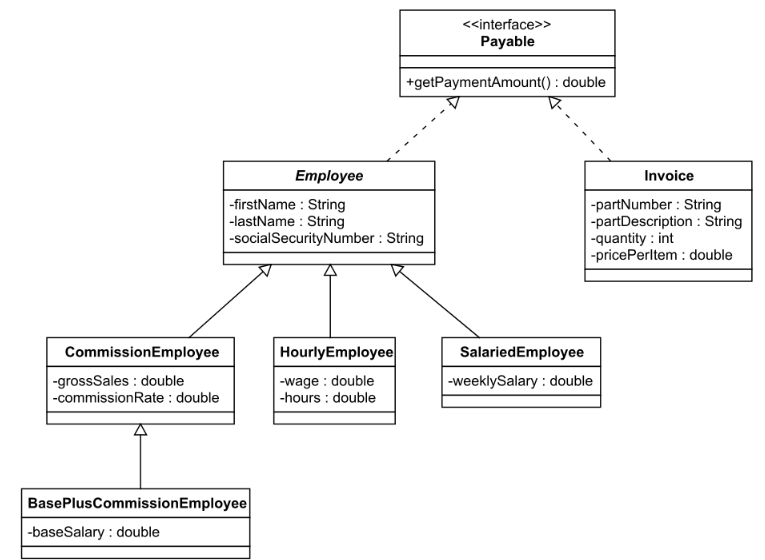
1. i) Write a java program for bank data database using Map interface of java collection framework. In bank costumer name may repeated with some unique constraint like first name, last name, date of birth but compulsory an account number is different. Also perform bank operation. Also display total balance available at bank open and at the time of closing bank and display all account name in descending order of available balance.
2. i) Implement JAVA application and demonstrate how to traverse or move cursor/pointer in database. i.e ResultSet and its cursor movement to update particular record in database.

ii) Design a java class to represent a bank account. Include the following members: Data Members- Name of the depositor, account number, type of account and balance in account. Methods - to assign initial values, to deposit an amount, to withdraw an amount after checking balance and to display account details.

1. i) Comparable and Comparator – write a java program to demonstrate comparable interface and comparator class. Distinguish two collections are different or not, based on single data member and multiple data member. Also use insertion order given by comparable or comparator.

ii) Write a java program for bank data database using Map interface of java collection framework. In bank costumer name may repeated with some unique constraint like first name, last name, date of birth but compulsory an account number is different. Also perform bank operation.

1. i) Implement following scenario represented in diagram.



Suppose you are creating java based software SALARY application for a company. SalarySoftware class contain the main method. SalarySoftware class uses Employee as a subclass. There are three types of employee, 1) commission employee works on commission, 2) salaried employee works on weekly salary and 3) hourly employee works on clock hour basis. Each employee has a different salary. Invoice is the final document for representing final amount. If required assume suitable data.

1. i) Write a Java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number.

ii) Design a java class to represent a bank account. Include the following members: Data Members- Name of the depositor, account number, type of account and balance in account. Methods - to assign initial values, to deposit an amount, to withdraw an amount after checking balance and to display account details.

1. i) Suppose you are implementing arithmetic calculator using package and different access privilege for each operation. In each package only one operation is implemented. For multiplication and division contain parent class in new package for taking user input and checking input number is zero or not.

ii) Suppose in Number.txt file some random number are stored (-ve/+ve/fractional number). Using JAVA program find how many numbers are –ve, +ve and fractional number.

1. i) Write a java program to create an abstract class named Shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that each class extends the class Shape. Each class contains only the method printArea() that prints the area of the given shape. Also show and demonstrate the difference between overriding and overloading.

ii) Implement a Java program using IO stream classes that takes bank-space separated data (one record per line, assume data – name, roll-number, mark, grade) from a text file and inserts this record into another text file if line number is even.

1. i) Demonstrate how to use data member and methods in multilevel inheritance by applying various access controls (all access modifier and non-access modifiers) for accessing data member and methods in or outside the class.

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ii) Implement simple arithmetic calculator using Socket programming. Client Send operands and operator to server, in response server sends result.

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(show use of static, final, abstract and access specifier/modifiers).

If required assume suitable data and mention your assumption in program - either in comment form or call method to print assumption on console.

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First draw class diagram that represents application functionality using outer class and inner class (include all types of inner classes). Assume suitable data, functionality of library system.

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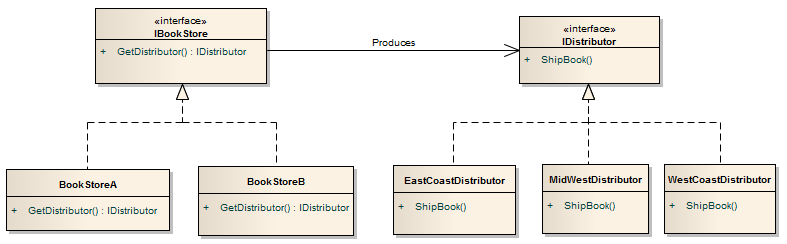
Assume required and suitable data.

1. i) Let’s say you own an online bookstore (IBookStore) and people come to your website to buy books. When a customer orders a book you just have another book distributor (IDistributor) send the book directly to the customer. You are a middle man and you don’t stock the books. You have many distributors that you can choose to send the books directly to your customers. Since you have many distributors, you have the following logic to determine which distributor to choose for sending the books to your customers:

If the customer is in the east coast, you will use EastCoastDistributor

If the customer is in the midwest, you will use MidWestDistributor

If the customer is in the west coast, you will use WestCoastDistributor



Implement above scenario for creating JAVA based application.

(Assume necessary data – datamember and method)

1. i) Write a java program to display file information and methods to create file, checking file is present or not, deleting file, get file name, path name, check is file or not, get file parent, modification or execution is allowed or not, last modification time, creating file directory, creating file under created directory through program with extension txt, path and file separator.

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1. Write a program to write student class state information into external resource file and to read student class state information from external resource file. Also show how different types of exception are arises during execution of file handling program. Exception - NullPointerException, IllegalArgumentException, IllegalStateException, EOFException, IndexOutOfBoundException, FileNotFoundException, SecurityException.
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1. i) Implement Stack and double ended Queue using interface available in JAVA. Perform its all operations using available methods (specific to stack and queue) for stack and queue in Queue and List interface.

ii) Suppose you are creating a JAVA application for OnlineShowroom for three (three java class) products 1) car, 2) truck and 3) bike. Also OnlineShowroom contains a class CustomerInfo and for this class all outer class data members are accessed with just name. When this OnlineShowroom class shows information about cars then information is only limited to current method or function. Based on available bike in OnlineShowroom, the bike information changes object to object. Consider any inner class type for truck class.

1. i) Create simple thread using Thread class and implementing Runnable class and show all information about thread like default name, priority, assign name using constructor, using setName, default priority, assign priority, call thread for execution, difference between calling thread and run method, current thread state etc. Also create multiple thread and show parent thread, child thread, their id, current state, priority, make one thread goes in sleeping state, thread is alive or not.

Also show object sharing in number of runnable thread objects. Consider bank application credit and debit.

ii) Implement java program to count number objects created from class.

1. i) Create 4 thread in java program for demonstrating the one thread gives chance to execute another thread. (yield method).

ii) Implement JAVA application and demonstrate how to traverse or move cursor/pointer in database. i.e ResultSet and its cursor movement to update particular record in database.

1. i) Create few thread in main function and implement this thread such that thread execution ends after exiting main thread. (join method).

ii) Implement JAVA application and demonstrate how to traverse or move cursor/pointer in database. i.e ResultSet and its cursor movement to update particular record in database.

1. i) Create calculator application such that client sends input and server implements required arithmetic operation and reply with result to client.

ii) Write a java program to read content from a file and write a content to file. suppose you are provided with buffer of size 30 bytes then how many read and write operation with given buffers are required.

1. i) Create calculator application such that client sends input and server implements required arithmetic operation and reply with result to client using RMI methodology.

ii) Suppose you want to implement ARRAYCLASS class and its all operation under CLASSPACKAGE. For implementing array you decided to create a data structure with name ARRAYOPERATION under package ARRARPACKAGE. Using this data structure performs all operations.

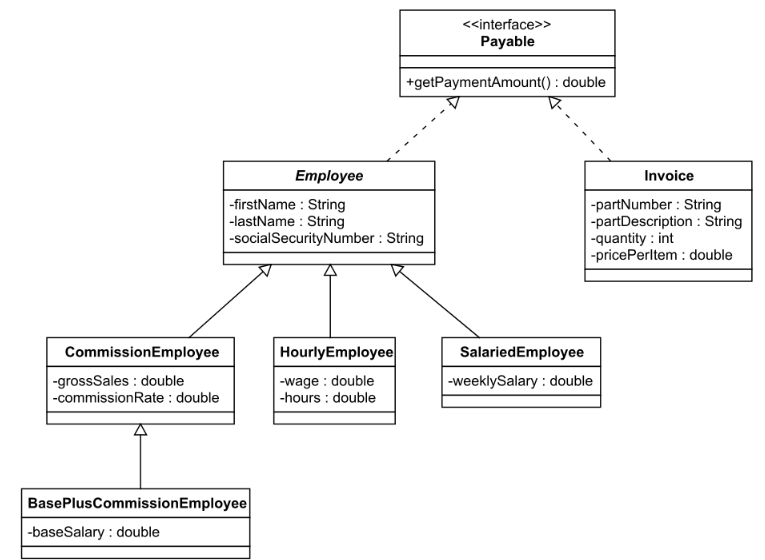
1. i) Write a java program to implement dynamic size student database system which includes roll number, name, branch, grade pointer. Based on user choice data member sort (use Comparable, Comparator), search student data in database, creating sub student database for equal branch. Also check how many students are on given or user choice grade. In application duplicate entries are not allowed (use suitable data structure). If any duplicate entry found at the time of insertion then throw duplicate entry exception.

ii) Design a java class to represent a bank account. Include the following members: Data Members- Name of the depositor, account number, type of account and balance in account. Methods - to assign initial values, to deposit an amount, to withdraw an amount after checking balance and to display account details.

1. i) Demonstrate packages in JAVA and access specifier/modifier with data member and methods. Also create a arithmetic calculator logic under one package and perform calculator operation in another package. Assume data member are not accessed outside the class.

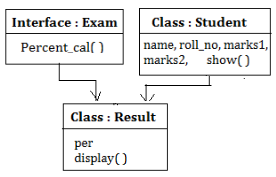
ii) Write a java program to create an abstract class named shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that classes contains only the method printArea() that prints the area of the given shape. Implement above program using interface. Also demonstrate invalid interface declaration and different errors.

1. Implement following scenario represented in diagram.



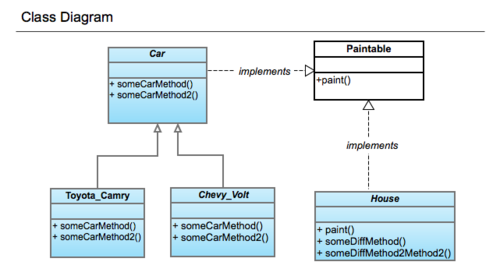
Suppose you are creating java based software SALARY application for a company. SalarySoftware class contain the main method. SalarySoftware class uses Employee as a subclass. There are three types of employee, 1) commission employee works on commission, 2) salaried employee works on weekly salary and 3) hourly employee works on clock hour basis. Each employee has a different salary. Invoice is the final document for representing final amount. If required assume suitable data.

1. i) Implement following diagram to demonstrate abstract class and interface.



ii) Create 4 thread in java program for demonstrating the one thread gives chance to execute another thread (yield method). Also shoe that thread execution ends after exiting main thread (join method). The job for the thread is to print number table and each thread prints different number table.

1. i) Implement following diagram using abstract class and interface. Assume suitable data member and methods.



ii) Write a student class details in external resource file and display required student information. Assume suitable data member and method.

1. i) Create a java based chat application using Socket programming and after sending 7 messages chat application closes connection.

ii) With suitable real world application demonstrate different types of inner classes and show how to access data member and methods in inner class. Also show how to access inner class method.

1. i) Suppose you created a data base for storing student information. After some time you realized that need to update some row from the student table. Create a java application for implementing above problem such that only particular row is updated.

ii) Write a java program to create an abstract class named shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that classes contains only the method printArea() that prints the area of the given shape.

1. i) Create an user defined object array using Arrays class. Perform all operation of array using Arrays class. (add, delete, search, modify, sort, comparing array, sub array creation (index position divisible by 2 or 7), copying array onto another array). Show how to traverse array using enumeration/iterator/enhanced loop.

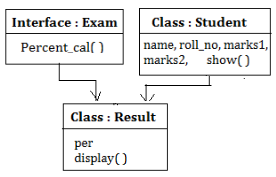
ii) Create a java based chat application using socket programming.

1. i) Write a program to read and write primitive data type into/from external resource file.

ii)  Comparable and Comparator – write a java program to demonstrate comparable interface and comparator class. Distinguish two collections are different or not, based on single data member and multiple data member.

1. i) Demonstrate Client/Server communication (networking) in Java using sockets. Send an expression to the server using the client program. Server will solve the simple expression and send the result back to the client.

ii) Implement following diagram to demonstrate abstract class and interface.



1. i) Demonstrate how to override class method using anonymous class.

ii) Write a java program to extract information of file like checking file is present or not, get file name, path name, check is file or not, get file parent, modification or execution is allowed or not, last modification time, file directory, number of bytes available for read, skip number of bytes from input stream, check stream reading for number of times (mark and reset method).

1. i) Write a Java program to create multiple threads for different calculator operations. Use extends Thread or Implements Runnable.

ii) Write a java program to create an abstract class named shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that classes contains only the method printArea() that prints the area of the given shape. Implement above program using interface. Also demonstrate invalid interface declaration and different errors.

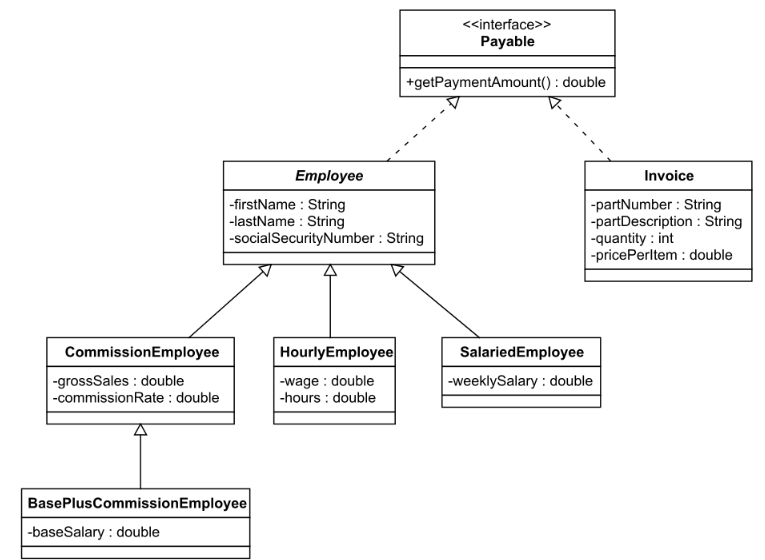
1. i) Write a java program for bank data database using Map interface of java collection framework. In bank costumer name may repeated with some unique constraint like first name, last name, date of birth but compulsory an account number is different. Also perform bank operation. Also display total balance available at bank open and at the time of closing bank and display all account name in descending order of available balance.
2. i) Implement JAVA application and demonstrate how to traverse or move cursor/pointer in database. i.e ResultSet and its cursor movement to update particular record in database.

ii) Design a java class to represent a bank account. Include the following members: Data Members- Name of the depositor, account number, type of account and balance in account. Methods - to assign initial values, to deposit an amount, to withdraw an amount after checking balance and to display account details.

1. i) Comparable and Comparator – write a java program to demonstrate comparable interface and comparator class. Distinguish two collections are different or not, based on single data member and multiple data member. Also use insertion order given by comparable or comparator.

ii) Write a java program for bank data database using Map interface of java collection framework. In bank costumer name may repeated with some unique constraint like first name, last name, date of birth but compulsory an account number is different. Also perform bank operation.

1. Implement following scenario represented in diagram.



Suppose you are creating java based software SALARY application for a company. SalarySoftware class contain the main method. SalarySoftware class uses Employee as a subclass. There are three types of employee, 1) commission employee works on commission, 2) salaried employee works on weekly salary and 3) hourly employee works on clock hour basis. Each employee has a different salary. Invoice is the final document for representing final amount. If required assume suitable data.

1. i) Write a Java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number.

ii) Design a java class to represent a bank account. Include the following members: Data Members- Name of the depositor, account number, type of account and balance in account. Methods - to assign initial values, to deposit an amount, to withdraw an amount after checking balance and to display account details.

1. i) Suppose you are implementing arithmetic calculator using package and different access privilege for each operation. In each package only one operation is implemented. For multiplication and division contain parent class in new package for taking user input and checking input number is zero or not.

ii) Suppose in Number.txt file some random number are stored (-ve/+ve/fractional number). Using JAVA program find how many numbers are –ve, +ve and fractional number.