

Velammal College of Engineering and Technology, Madurai
Department of Computer Science and Engineering
Object oriented programming lab

Exercise 6
Abstract class & Interface

Team 1

1. Define an abstract class “car” with members reg_no, model, reg_date. Define two subclasses of this class – “transportVehicles ” (validity_no, start_date, period) and “privateVehicle ” (owner_name, owner_address). Define appropriate constructors. Create n objects which could be of either transportVehicles or privateVehicle class by asking the user’s choice. Display details of all “privateVehicle” objects and all “transportVehicles” objects.
2. Create an interface Resizable that has a method resize which resizes the shape by a factor x. Create a class rectangle that implements resizable and has methods to print the area and perimeter of rectangle. Create a main method which creates the rectangle object with length =10 breadth=5, print the area and perimeter. Resize the rectangle by 5 then print the area and perimeter. Create another class Circle which has methods to print area and perimeter. Resize the circle by 10 then print the area and perimeter.

Team 2

1. Create a java abstract class to implement stack concept. Check for the overflow and empty conditions
2. Create an interface “CreditCardInterface” with methods to viewCreditAmount, viewPin, changePin and payBalance. Create a class Customer (name, card number, pin, creditAmount – initialized to 0). Implement methods of the interface “CreditCardInterface” in Customer class. Create an array of customer objects and perform the following actions.
 - Pay Balance
 - Change Pin

Team 3

1. Create an abstract class book which has variable title, author and price. It has an abstract method setdetails(), gettitle() which returns the title. Derive another class MyBook from Book class which implements setdetails method to set the title of book, author and price. Create 3 mybook objects in main method and then display the total price of these three books.
2. Define an interface “QueueOperations” which declares methods for a static queue. Define a class “MyQueue” which contains an array and front and rear as data members and implements the above interface. Initialize the queue using a constructor. Write the code to perform operations on a queue object.

Team 4

1. Use the abstract class Shape that include two integers and an empty method named printArea(). Construct the classes Rectangle, Triangle and Circle inherited from the class Shape. The Derived classes should include only the method printArea() that print the area of the given shape
2. Create an interface printable which has an abstract method void print(). Create three classes Rectangle, SportsCar and Manager classes which implements printable. Create objects for Rectangle, SportsCar and Manager in Main method. the rectangle object should print the length and breadth along with the area, Sportcar should print the brandname, Model and price, Manager object should print the name, age, EmployeeID and salary details.

Team 5

1. Create an abstract class Employee with the data members name, age and hourRate. It has a concrete (normal) method toString() method and an abstract method double CalcSalary(double hours). Derive two classes manager and clerk which implements abstract method to calculate salary based on the hours. Create 2 Manager and 1 Clerk object and display all the details like name, age, hourRate and Salary.
2. Write a program to create interface method named customer. In this keep the methods called information(), show() and also maintain the tax rate. Implement this interface in employee class and calculate the tax of the employee based on their income.

<i>Income</i>	<i>Tax Percentage</i>	
	Male	Female
>=1,90,000	Nil	Nil
>=2,00,000	10%	Nil
>=5,00,000	20%	10%
<5,00,000	25%	20%

Team 6

1. We have to calculate the percentage of marks obtained in three subjects (each out of 100) by student A and in four subjects (each out of 100) by student B. Create an abstract class 'Marks' with an abstract method 'getPercentage'. It is inherited by two other classes 'A' and 'B' each having a method with the same name which returns the percentage of the students. The constructor of student A takes the marks in three subjects as its parameters and the marks in four subjects as its parameters for student B. Create an object for each of the two classes and print the percentage of marks for both the students.
2. Define an interface using Java program that contains a method to calculate the perimeter of object. Define two classes – circle and rectangle with suitable fields and methods.

Implement the interface “perimeter” in these classes. Write the appropriate main() method to create object of each class and test all methods.

Team 7

1. Create an abstract class Person with the data members name, Aadhar number, abstract methods such as void getData() and void display() . Derive two classes Student and Faculty from person class which implements abstract methods. Apart from these student class have to display the marks secured and employee has to display the salary details
2. Create an interface printable which has an abstract method void calculateBill() and void display(). Create two classes SuperMarket and Restaurant which has to implement printable interfaces. In the Main method create objects for both the classes and print the bills for both the classes