Q1. Create a class Student with rollno, name, age and totalmark as instance variables and methods get(), disp(), findgrade(). If total mark is greater than 900 grade A, greater than 700 grade B, greater than 500 grade C else failed. Create a subclass ProjectStudent from the Student class with the data members projid, projtitle, company, projgrade with methods getPDetails(), dispPDetails(). Create instance of Project Student and invoke all the methods in main. (Do the program without using constructors)

Project:

```
import java.util.Scanner;
class Student
{
        String roll,name;
        int age , totalmark;

 void get()
   {
        Scanner s = new Scanner(System.in);
     System.out.println("Enter the Roll Number :");
        roll = s.nextLine();
     System.out.println("Enter the name of the student :");
        name = s.nextLine();
        System.out.println("Enter the age of the student :");
        age = s.nextInt();
        System.out.println("Enter the total marks of the student :");
        totalmark = s.nextInt();
    }
 void display()
   {
        System.out.println("Roll Number :" + roll);
        System.out.println("Name :" + name);
        System.out.println("Age :" + age);
        System.out.println("Total Marks :" + totalmark);
    }
 void findgrade()
   {
        char grade;
        if (totalmark > 900) {
                grade = 'A';
           }
        else if (totalmark > 700) {
                grade = 'B';
           }
     else if (totalmark > 500) {
                grade = 'C';
           }
        else {
            grade = 'F';
```

```java
            }
        }
}
 class ProjectStudent extends Student
 {
         int projid;
         String projtitle,company, projgrade;

   void getPDetails()
     {
         Scanner s = new Scanner(System.in);
         System.out.println("Enter the project ID :");
         projid = s.nextInt();
         System.out.println("Enter the project title :");
         projtitle = s.nextLine();
         System.out.println("Enter the Company :");
         company = s.nextLine();
         System.out.println("Enter the project Grade :");
         projgrade = s.nextLine();
     }
   void dispPDetails()
     {
         System.out.println("Project ID :" + projid);
         System.out.println("Project Title :" + projtitle);
         System.out.println("Company :" + company);
         System.out.println("Project grade :" + projgrade);
     }
   }
class STmain
 {
   public static void main(String [] args)
    {
      ProjectStudent p = new ProjectStudent();
         p.get();
         p.findgrade();
         p.getPDetails();
         p.dispPDetails();
    }
}
```

Output:

Q2 Create a class named EmployeeSample having the following data members: name, age, phoneno, address, salary .It also has a method named printSalary which prints the salary of the employee. Another class Manager inherits the Employee class. The Manager class have data member department. Now, assign name, age, phone number, address, salary and department to a manager by making an object of Manager class and print the salary.

Program:

```java
class EmployeeSample
{
        int age;
        String name , address , phoneno;
        double salary;
  void printSalary()
    {
        System.out.println("Salary : Rs" + salary);
    }
}

class Manager extends EmployeeSample
{
        String department;
}
class EmployeeSamplemain
{
  public static void main(String args[])
  {
        Manager m = new Manager();
        m.name = "RAJSHREE";
        m.age = 26;
        m.phoneno = "1234567890";
        m.address = "Amravati,Maharashtra";
        m.salary = 75000;
         m.department = "Data Analyst";

    System.out.println("Manager's Information:");
    System.out.println("Name :" + m.name);
    System.out.println("Age :" + m.age);
    System.out.println("Phone number :" + m.phoneno);
    System.out.println("Address :" + m.address);
    System.out.println("Department :" + m.department);
    m.printSalary();
  }
}
```

Output :

```
E:\java notes>javac EmployeeSamplemain.java

E:\java notes>java EmployeeSamplemain
Manager's Information:
Name :RAJSHREE
Age :26
Phone number :1234567890
Address :Amravati,Maharashtra
Department :Data Analyst
Salary : Rs75000.0
```
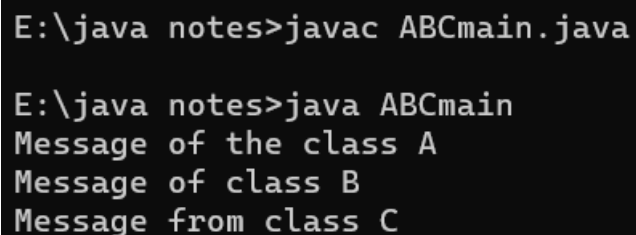
Q3. Create a class A with the method dispmsg() which prints some message. Create one sub class of A with name B and override the dispmsg() function, also create one more subclass from B with name C and override the dispmsg() function in C also. In main invoke that function with the help of three class instances.

Program:
```java
class A
 {
   void dismsg() {
     System.out.println("Message of the class A");
     }
 }
class B extends A {
   void dismsg () {
     System.out.println("Message of class B ");
     }
 }
class C extends B {
    void dismsg() {
       System.out.println("Message from class C");
       }
 }
class ABCmain
 {
   public static void main(String args[])
    {
     A a = new A();
         B b = new B();
         C c = new C();

     a.dismsg();
         b.dismsg();
         c.dismsg();
     }
}
```

Output:

```
E:\java notes>javac ABCmain.java

E:\java notes>java ABCmain
Message of the class A
Message of class B
Message from class C
```

Q4. Create a class named Account with following members.
 I. Data Members
a. accNo
b. Name
c. accType
d. accBalance
II. Function members
a. Constructor to accept all values
b. deposit(int amt) accepting amount and add with the accBalance
c. withdraw(int amt) accepting amount to subtract from the accBalance
d. checkBalance() to return the present accBalance
Inherit classes such as SavingsAccount and PrivilegedAccount from the class
Account. The rules of these account types are as follows:-
I. SavingsAccount
a. Deposit – can deposit upto a maximum of 50000 only in one transaction.
b. Withdraw – a minimum balance of 1000 should be there at any time.

Program: I)**SavingsAccount**

```java
import java.util.Scanner;
class Account
{
    int accNo;
        String name,accType;
    double accBalance;

 void deposit(double amt)
  {
    accBalance = accBalance + amt;
    System.out.print("Balance after deposit :" + accBalance);
  }
 void withdraw (double amt)
  {
     accBalance = accBalance - amt;
     System.out.print("Balance after withdraw  :" + accBalance);
  }
}

class SavingAccount extends Account
 {
  SavingAccount(int an, String n, String t,double b)
  {
    accNo = an;
    name = n;
    accType = t;
    accBalance = b;
  }
  void deposit(double amt)
  {
   if (amt <= 50000)
     super.deposit(amt);
   else
      System.out.print("Amount is greater than 50000");
  }
  void withdraw(double amt)
  {
   if (accBalance - amt>=1000)
     super.withdraw(amt);
   else
```

```
        System.out.print("Minimum balance should be 1000");
    }
}
class SAmain
{
  public static void main(String[] args)
   {
     Account a = new Account();
     SavingAccount s = new SavingAccount(111,"Nidhi","saving",7000.00);
     s.deposit(4000);
   }
}
```

Output:

```
E:\java notes>javac SAmain.java

E:\java notes>java SAmain
Balance after deposit :11000.0
```

II) **PrivilegedAccount:**
Program:

```
import java.util.Scanner;
class Account
{
     int accNo;
         String name,accType;
     double accBalance;

  void deposit(double amt)
   {
     accBalance = accBalance + amt;
     System.out.print("Balance after deposit :" + accBalance);
   }
  void withdraw (double amt)
   {
      accBalance = accBalance - amt;
       System.out.print("Balance after withdraw  :" + accBalance);
   }
}

class PrivilegedAccount extends Account
{
     PrivilegedAccount(int acc, String n, double ab)
    {
     accNo = acc;
     name = n;
     accBalance = ab;
     }
  void withdraw(double amt) {
      if ( amt <= (accBalance + 5000))
         super.withdraw(amt);
      else
```

```java
            System.out.println("Max overdraft limit for Privileged Account is 5,000.");
        }
    }
    class PAmain
    {
      public static void main(String[] args)
      {
       Account a = new Account();
       PrivilegedAccount p = new PrivilegedAccount(120,"Anna",10000);
       p.withdraw(4000);
      }
    }
```

Output:

```
E:\java notes>javac PAmain.java

E:\java notes>java PAmain
Balance after withdraw  :6000.0
```

Q5. Write a class called Square with a method area(double a) that finds the area(a2) of the square. Create a class Cube which is a subclass of Square and write an overriding method area(double a) that finds the surface area (6a2) of the cube using super keyword. In the main function, invoke the function using the two class instances.

```java
class Square
{
    double area (double a)
        return a * a;

}
class Cube extends Square
{
  double area (double a)
  {
    double squareArea = super.area(a);
    double surfaceArea = 6 * squareArea;
     return surfaceArea;
  }
}
 class SCMain
{
   public static void main(String[] args)
   {
     Square square = new Square();
     Cube cube = new Cube();

     double sideLength = 5.0;
```

```
        double squareArea = square.area (sideLength);
        double cubeSurfaceArea = cube.area ( sideLength);
        System.out.println("Area of the Square: " + squareArea);
        System.out.println("Surface Area of the Cube: " + cubeSurfaceArea);
    }
}
```

Output:

```
E:\java notes>java SCMain
Area of the Square: 25.0
Surface Area of the Cube: 150.0
```