1. Create a class named 'student' with string variable 'name' and integer variable 'roll-no'. Assign the value of roll-no as '2' and that of name as "John" by creating an object of the class student.

```
Student stud1
  {
  string name;
  int roll-no;

void getdata (string s, int i)
  {
  name = s;
  roll.no = i;
  }

void putdata ()
  {
System.out.println("name = "+name);
System.out.println("roll-no = "+roll.no);
  }

public static void main (String args[])
  {
```

```
Student s = new student();
s.getdata("John", 2);
  g.putdata();
  }
}
```

Output:-
name = John
roll-no = 2

Q.2 Assign and print the roll-number, phone number and address of two students having names "sam" and "John" respectively by creating two objects of class student.

```
Student stud 1
  {
int roll-no; phoneno;
  string address; name)
void getdata (int a, int b, string
              String c, string d)
```

```
{
roll_no = a;
phone_no = b;
address = c;          name = ①
}
void putdata ()
{System.out.println(" name = " name);
System.out.println (" student roll_no = "
                    roll_no);
System.out.println (" student phone_no =
                    phone_no);
System.out.println (" student address =",
                    address);
}
class program2 {
public static void main (String args)
{
Student S[] = new Student [2];
for (int i=0; i<2 ; i++)
{
S[i] = new Employee ();
}
for (int i=0 ; i<2 ; i++)
{
s[i]. get (2, 1234567890, "sam")
}
```

```
for (int i=0; i<2 ;i++)
        {
        S[i].show();
        }
    }
}
```

Q.3. Write a program to print the area and perimeter of a triangle having sides of 3, 4 and 5 units by creating a class named "Triangle" without any parameter in its constructor.

```
class Triangle
    {
```

Q.3. write a program to print the area and perimeter of triangle having sides of 3, 4 and 5 unit: by creating a class named 'Triangle' without any parameter is its constructor.

```
import java.util.*;
  class Triangle
    {
    int a, b, c;
public double getArea()
    {
double s = (a+b+c)/2.0;
return = math.pow(s*(s-a)*
    (s-b)*(s-c),5);
  }
public double getparameter()
    {
    return (a+b+c)/2.0;
    }
  }
  class Ans {
public static void main (String args[])
    {
Triangle t1 = new triangle();
    t1.a = 3;
    t1.b = 4;
```

```
t1.(=5,
System.out.println("Area of triangle is:"
        +t1.getArea());
System.out.println("perimeter of trian-
gle is:"+t1.getparameter());
    }
  }
```

Q.4. write a program to print the area and perimeter of a triangle having sides of 3, 4, and 5 units by creating a class named "Triangle" with constructor having the three sides as its parameters.

```
import java.util.*;
public class triangle
  {
void area(int a, int b, int c)
  {
Float s=((a+b+c)/2)
Float A=Sqrt(s*(s-a)*(s-b)*(s-c));

System.out.println("Area of triangle
    is" A "sq.units");
  }
void perimeter(int a, int b, int c)
  {
```

```
System.out.println("parimeter of a
triangle is" +a+b+c "units\n");
    }
public static void main (String args[])
    {
int side 1 = 3, side 2 = 4,
    side 3 = 5;

Triangle t1 = new triangle();
T1.area (side1, side2, side3);
T1.parimeter (side1, side2,
    side3);

    }
}
```

3.5) write a program to print area of rectangle having sides (4,5) & (5,8) respectively by creating a class name 'Rectangle', with method name 'Area' with return the area and length breadth passed as parameter to its constructor.

```
class Rectangle
  {
  int length, breadth;
public rectangle (int a, int b)
        {
        length = a;
        breadth = b;
      }

public int getArea ()
  {
  return (length * breadth );
  }

public int getparameter ()
    {
    return 2 (length + breadth );
  }
  }
```

```
class Test
{
public static void main (String args[])
{
rectangle a = new rectangle (4,5);
rectangle b = new rectangle (5,8);

System.out.println ("Area" + a.getArea() +
"perimeter is" + a.getparameter());

System.out.println ("Area" + a.getArea() +
"perimeter is" + a.getperimeter());
}
}
```

Q. 6. Write a program to print the area of a rectangle by creating a class named 'Area' having two methods. First method named as 'setDim' takes length and breadth of rectangle as parameters and the second method named as 'getArea' returns the area of the rectangle are entered through keyboard.

```
class Rectangle
  {
int length, breadth;
void setDim (int l, int w)
  {
   length = l;
   width = w;
  }
void getarea ()
  {
area = length x breadth
  }
void putdata ()
  {
System.out.println("length = " +length);
System.out.println("width = " +width);
  }
```

```
public static void main (String args[])
    {
Rectangle Rect1 = new Rectangle;
 Rect1.setDim (4,5);
 Rect1. getarea();
 Rect1. putdata();
    }
}
```

9.7. Write a program to print the area of a rectangle by creating a class named 'Area' taking the values of its length and breadth as parameters of its constructor and having a method named 'returnArea' which returns the area of the rectangle. Length and breadth of rectangle are entered through keyboard.

```
import java.util.Scanner;
class Area
    {
    int length;
    int breadth;
public Area (int l, int b)
        {
        length = l;
```

```
        breadth = b; }
public int return Area()
    {
    return (length * breadth);
    }
public static void main (String args[])
    {
Scanner s = new Scanner (System.in)
    int l, b;
System.out.println ("Enter length");
    l = s.nextInt;
System.out.println ("Enter breadth");
    b = s.nextInt();
  Area a = new Area (l, b);
System.out.println ("Area of recta-
        ngle" + a.getreturn.
        Area());
    }
  }
```

Q.8. print the average of three numbers entered by user by creating a class named 'Average' having a method to calculate and print the average

```
import java.util.Scanner;
public class ~~Exerci~~ average
        {
public static void main (String args[])
    {
Scanner in = new Scanner (System.in);
System.out.print("~~Input~~ Enter the first no.:");
   double x = in.nextDouble();
System.out.print ("Enter the second no.:");
double y = in.nextDouble();
System.out.print ("Enter the Third no.:")
  double z = in.nextDouble();
System.out.print ("The average value
                is" + average (x,y,z)+"\n");

public static double averge (double x,
        double y, double z)
    {
  return (x+y+z)/3;
    }
  }
```

Q.9. print the sum, difference and product of two complex numbers by creating a class named 'complex' with separate methods for each operation whose real and imaginary parts are entered by user.

```
public class complex
        {
        double real;
        double imag;
public complex (double real, double imag)
        {
        this.real = real;
        this.imag = imag;
        }
public static void main (String args[])
        {
        complex n1 = new complex (2.3, 4.5),
                n2 = new complex (3.4, 5.0),
                temp;
        temp = add (n1, n2);
System.out.println ("sum = %.1f + %.
  1fi", temp.real, temp.imag);
        }
public static complex add (complex n1,
                complex n2)
```

```
    {
complex temp = new complex(0.0, 0.0);
temp.real = n1.real + n2.real;
temp.imag = n1.imag + n2.imag;
    return (temp);
  }
}
```

output:-

✓ Sum = 5.7 + 9.5i

q.10. write a program that would print the information (name, year of joining, salary, address) of three employees by creating a class named 'Employee'. The output should be as follows:

Name	year of joining	Address
Robert	1994	64C - WallsStreat
Sam	2000	68D - WallStreat
John	1999	26B - WallsStreat

```
class Employee {
  private String name, address;
    int year_of_joining, salary;
public Employee (String n, int y, int
  Sal, string add)
    {
```

```
        name = n;
        year = y;
        salary = sal;
        address = add;
        }
    public String getName()
            {
        return name;
        }
    public int getyear_of_joining()
            {
        return year_of_joining;
        }
    public int getsalary()
            {
        return salary;
        }
    public String getAddress()
            {
        return address;
        }
    }
    class Emp
            {
    public static void main(String args[])
            {
```

```
Employee e1 = new Employee ("Robert",
        1994, 5000, "64C - WallSStreet");
Employee e2 = new Employee ("sam", 2000,
    6000, "68D - WallsStreet");
Employee e3 = new Employee ("John", 1999
    7000, "26B - WallsStreat");

System.out.println ("Name \t year of joi-
    ning \t salary \t Address");
System.out.println (e1.getName() + "\t" +
e1.getyear() + "\t\t\t" + e1.getsalary() + "\t"
    + e1.getAddress());
System.out.println (e2.getName() + "\t" + e2.
getyear() + "\t\t\t" + e2.getsalary() + "\t" +
    e2.getAddress());
System.out.println (e3.getName() + "\t" +
e3.getyear() + "\t\t\t" + e3.getsalary() + "\t"
    + e3.getAddress());
        }
    }
```

(11) Add two distances in inch-feet by creating a class named 'AddDistance'.

```
using namespace std;
class AddDistance
{
```

```
import java.util.*;
class AddDistance
{
```

```
private int Feet;
        int inch;
public void getDistance ()
        {
    Scanner sc = new Scanner (System.in);
System.out.print ("Enter feet:");
  Feet = sc.nextInt ();
System.out.print ("Enter inches:");
     inches = sc.nextInt ();
   }
public void showDistance ()
     {
  System.out.println ("Feet :" + Feet +
 "\tInches :" + inches);
   }
public void AddDistance (Distance D1,
                         Distance D2)
      {
   inches = D1.inches + D2.inches;
    Feet = D1.Feet + D2.Feet + (inches
                              /12);
      inches = inches %12;
    }
  }
public class AddTwoDistance
        {
```

```
public static void main(String args[])
    {
    try
    {
Distance d1 = new Distance();
 distance d2 = new Distance();
 Distance d3 = new Distance();
System.out.println("Enter first distance");
    d1.getDistance();
System.out.println("Enter second distance");
    d2.getDistance();
 d3.addDistance(d1, d2);
System.out.println("Total distance is:");
    d3.showDistance();
  }
catch (Exception e)
    {
  System.out.println("Exception occurred"
      + e.toString());
    }
  }
}
```

Q. 12) write a program by creating an 'Employee' class having the following methods and print the final salary.

1. 'getInfo()' which takes the salary, number of hours of work per day of employee as parameter
2. 'Addsal()' which adds $10 to salary of the employee if it is less than $500
3. 'AddWork()' which adds $5 to salary of employee if the number of hours of work per day is more than 6 hours.

```
import Java.util.*;
class Employee {
private string name;
private float salary, hours;

public employee detail () {
    name = " "
    salary = 0;
    hours = 0;
    }
public void getInfo (String n, float
                sal, float hr) {
    name = n;
    salary = sal;
    hours = hr;
    }
public float Addsal() {
```

```
if (salary < 500) {
    salary = salary + 10;
    }
    return salary;
    }
public float AddWork() {
    if (hours > 6) {
    Salary = salary + 5;
    }
    return salary;
    }
    }
pub class TestEmployee {
    float salary;
public TestEmployee (float sal) {
    salary = sal
}
public void printsal () {
System.out.println ("salary" + salary)
    }
    }
    class Emp
    {
public static void main (String args[])
    {
Employee detailemp = new Employee detail
```

```
Scanner sc = new Scanner (System
                          .in);
System.out.println ("Enter the name");
    String name = sc.nextline ();
System.out.println ("Enter salary");
    sc.nextline ();

System.out.println ("Enter salary");
    float salary = sc.nextfloat ();
System.out.println ("Enter no. of hours")
    Float hours = sc.nextfloat ();
emp.getInfo (name, salary, hours);
    salary = emp.Addsal ();
emp.getINFO (name, salary, hours);
    salary = emp.addwork ();

Test employee Test = new testemployee ();
    test.printsal ();
    }
```

3. create a class called 'matrix' containing constructor that initialize the number of rows and number of columns of a new matrix object. The matrix class has the following information:

1. number of rows of matrix
2. number of columns of matrix
3. elements of matrix in the form of 2D array.

```
class matrix
 {
private double [][] mat;
 int row, column;
 matrix()
  {
   row=0;
   column=0;
  }
int row, column
 matrix()
  {
   row=0
  column=0;
  }
matrix(int r, int c)
  {
   row=r;
    column=c;
    mat=new;
double [row][column];
  }
```

```
public void get input ()
  {
Scanner s = new Scanner (System.in);
   int i=0 ; j=0 ;
System. out. println ("Enter the matrix
elements (rowwise)
  for (i=0 ; i<row ; i++) {
  for (j=0 ; j<column ; j++) {
  Mat [i][j] = s.nextDouble () ; } } }
  public void print_matrix () {
     int i=0 , j=0 ;
  System. out. println (" The matrix is ");
   For (i=0 ; i<row ; i++) {
System. out. println (" " + mat [i] [j]);
     } } } }
   class Test
     {
private static matrix m1, m2, m3;
public static void main (String args
                              [])
     {
     int i=0; j=0 ; r=0 , c=0 ;
Scanner s = new Scanner (System. in);
System. out. println ("Enter no. of rows");
     r = s.nextInt ();
System. out. println ("Enter no. of column");
```

```
        c = S.nextInt();
System.out.println("Enter first matrix");
        m1 = new matrix(r,c);
        m1.getinput();
        m1.print matrix();
        }
    }
```

Q.14. The matrix class has method for each of the following

1. get the number of rows
2. get the number of columns
3. set the element of the matrix at given position (i, j)
4. adding Two matrices. If the matrices are not adable, "matrices cannot be added", will be displayed
5. multiply two matrix

```
class matrix {
    int row;
    int column;
    int [][] a;
public matrix(int r, int c)
    {
    row = r;
column = c;
```

```
a = new int [row][column];
  }
public int getRows() {
    return row;
  }
public int getElement (int
public int getcolumn () {
    return column;
  }
public int getElement (int r, int c)
  {
  return a[r][c]; }

Matrix m1 = new matrix (n.row, y.
                        column);
For (int j=0; j<x.row; j++)
  {
For (int i=0; i<y.column; i++)
  {
  int sum = 0;
For (int k=0; k<x.column; k++)
  {
sum = sum + (x.getElement (j,k) * y).
    getElement (k,i); }
 m.SetElement (j, i, sum); } }
```

```
        return m ; }
public void printmatrix() {
System.out.println("matrix is");
 for(int i=0 ; i<row ; i++) {
 for(int j=0 ; j<column ; j++)
   {
System.out.println(a[i][j] + "\t");
   }
System.out.println(" ");
   } }
    }
   class Test {
public static void main(String args[])
   {
   Matrix m = new matrix (3,3);
   matrix n = new matrix (3,3);
       int k = 1;
 for(int i=0 ; i<3 ; i++)
   {

 For(int j=0 ; j<3 ; j++) {
   m.setElement (i, j, k);
     k++ ;
   n.setElement (i, j, k);
   k++;
   }
  }
```

```
        m.printmatrix();
        n.printmatrix();
    matrix o = matrix.odd(m,n);
        o.printmatrix();
matrix p = matrix.product(m,n);
    p.print matrix();
      }
    }
```