1. **Create a Graphics package that has classes and interfaces for figures Rectangle, Triangle,Square and Circle. Test the package by finding the area of these figures.**

Program

Driver.JAVA

```
package driver;

/**
 *
 * @author sjcet
 */
import graphics.circle;
import graphics.Rect;
import graphics.Square;
import graphics.Triangle;
import java.util.Scanner;
public class Driver {

   /**
    * @param args the command line arguments
    */
   public static void main(String[] args) {
      // TODO code application logic here
      Scanner sc = new Scanner(System.in);
      int choice;
      circle obj1 = new circle();
      Rect obj2 = new Rect();
      Square obj3 = new Square();
      Triangle obj4 = new Triangle();
            System.out.println("Choose  any        1)Circle      2)Rectangle      3)Square
4)Triangle: ");
            choice = sc.nextInt();
            switch (choice) {
               case 1:
                  obj1.area();
                  break;
               case 2:
                  obj2.area();
                  break;
               case 3:
                  obj3.area();
                  break;
               case 4:
                  obj4.area();
               default:
```

```
                break;
            }

        }
    }
```

Rect.JAVA

```
package graphics;

/**
 *
 * @author sjcet
 */
import java.util.Scanner;
public class Rect implements
    area_cal{int l,b;

    public void area(){
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the length of the rectangle :");
        l = sc.nextInt();
        System.out.println("Enter the breath of the rectangle");
        b = sc.nextInt();
        System.out.println("Area of the rectangle = "+l*b);
    }
}
```

Square.JAVA

```
package graphics;

/**
 *
 * @author sjcet
 */
import java.util.Scanner;
public class Square implements
    area_cal{int side;

    public void area() {
        Scanner sc = new Scanner(System.in);
        System.out.println("Input side length of square : ");
        side = sc.nextInt();
        String area = Double.toString(side*side);
        System.out.println("Area of the square : "+area);
    }
}
```

Triangle.JAVA

```
package graphics;

import java.util.Scanner;
public class Triangle implements
   area_cal{int side;

   public void area() {
      Scanner sc = new Scanner(System.in);
      System.out.println("Input side length of square : ");
      side = sc.nextInt();
      String area = Double.toString(side*side);
      System.out.println("Area of the square : "+area);
   }
}
```

Circle.java

```
package graphics;

import java.util.Scanner;
public class circle implements
   area_cal{int radius;

   public void area() {
      Scanner sc = new Scanner(System.in);
      System.out.println("Input radius of circle : ");
      radius = sc.nextInt();
      String area = Double.toString(Math.PI*radius*radius);
      System.out.println("Area of the circle is : "+area);
      sc.close();
   }
}
```

area_cal.java

```
package graphics;

/**
 *
 * @author sjcet
 */
public interface area_cal
   {void area();
   }
```

OUTPUT

```
Choose any    1)Circle   2)Rectangle   3)Square  4)Triangle:
2
Enter the length of the rectangle :
4
Enter the breath of the rectangle
2
Area of the rectangle = 8
```

2. **Write a user defined exception class to authenticate the user name and password.**

Program

```
package checklogincredential;

/**
 *
 * @author sjcet
 */
import java.util.Scanner;


   /**
    * @param args the command line arguments
    */
   class UsernameException extends Exception {

     public UsernameException(String msg)
     {super(msg);
   }
  }
   class PasswordException extends Exception {

   public PasswordException(String msg)
   {super(msg);
 }
}
   public class CheckLoginCredential
   { public static void main(String[] args)
   {
       // TODO code application logic here
        Scanner s = new Scanner(System.in)
  String username, password;
```

```
System.out.print("Enter username :: ");
username = s.nextLine();

System.out.print("Enter password :: ");
password = s.nextLine();

int length = username.length();

try
{
  if(!username.equals("admin"
```

```
throw new UsernameException("Username must be admin");
else if(!password.equals("admin"))
     throw new PasswordException("Incorrect password\nType correct password ???");
    else
     System.out.println("Login Successful !!!");
   }
   catch (UsernameException u)
   {
    u.printStackTrace();
   }
   catch (PasswordException p)
   {
    p.printStackTrace();
   }
   finally
   {
    System.out.println("The finally statement is executed");
```

OUTPUT

```
Enter username :: admin
Enter password :: admin
Login Successful !!!
The finally statement is executed
```

3. **Find the average of N positive integers, raising a user defined exception for each negative input.**

Program

```
package signexception;
import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStreamReader;

class MyException extends Exception
{
 public MyException(String str)
 {
  System.out.println(str);
 }
}
public class SignException {

    /**
     * @param args the command line arguments
     */
    public static void main(String[] args) throws IOException{
        // TODO code application logic here
        BufferedReader br = new BufferedReader(new InputStreamReader(System.in));
  System.out.print("Input number :: ");

  try {
   int num = Integer.parseInt(br.readLine());
   if(num < 0)
    throw new MyException("Number is negative");
   else
    throw new MyException("Number is positive");
  }
  catch (MyException m)
   {System.out.println(m);
  }
 }
    }
```

OUTPUT

```
Input number :: 22
Number is positive
signexception.MyException
```