1. Write a program in Java to print Fibonacci series.

```
import java.util.*;
public class Fibonacci
{
        public static void main(String[] args)
        {
      int a = 0, b = 0, c = 1, n;
      Scanner r = new Scanner(System.in);
      System.out.print("Enter value of n : ");
      n = r.nextInt();
      System.out.println("Fibonacci Series : ");
      for(int i = 1; i <= n; i++)
      {
         a = b;
         b = c;
         c = a + b;
         System.out.print(a+"\n");
      }
   }
}
```

Output :-

```
Enter value of n : 10
Fibonacci Series :
0
1
1
2
3
5
8
13
21
34
Press any key to continue . . .
```

2. Write a program in Java to print Factorial of a number.

```
import java.util.*;
public class factorial
{
    public static void main(String []args)
    {

      Scanner r=new Scanner(System.in);
      System.out.print("Enter the number : ");
      int num=r.nextInt();
      int i=1,fact=1;
      while(i<=num)
      {
         fact=fact*i;
         i++;
      }
      System.out.println("Factorial of the number : " + fact);
    }
}
```

Output :-

3. Write a program in Java to demonstrate command line arguments.

```
import java.util.*;

class argument

{

	public static void main(String [] args)

	{

		System.out.println("Your first argument is : " + args[0]);

	}

}
```

Output :-

```
Your first argument is : 20
Press any key to continue . . .
```

4. Write a program in Java to create student information using array.

```
import java.util.*;

public class array
{
   public static void main(String arg[])
   {
      String names[] = {"Rajesh", "Suresh", "Ramesh", "Kamlesh", "Vignesh"};
      int marks[] = {78, 56, 90, 98, 49};
      char sec[] = {'A', 'B', 'A', 'A', 'B'};
      for(int i = 0; i<names.length; i++)
      {
         System.out.println(names[i] + " in section " + sec[i] + " got " + marks[i] + " marks." );
      }
   }
}
```

Output :-

```
Rajesh in section A got 78 marks.
Suresh in section B got 56 marks.
Ramesh in section A got 90 marks.
Kamlesh in section A got 98 marks.
Vignesh in section B got 49 marks.
Press any key to continue . . .
```

5. Write a program in Java to implement user defined package.

```
package hello;
class a
{
	void show()
	{
		System.out.println("This is example of package");
	}
}
class abc
{
	public static void main(String [] args)
	{
		a r = new a();
		r.show();
	}
}
```

Output :-

```
This is example of package
Press any key to continue . . .
```

6. Write a program in Java to implement default and parameterized constructor.

a) Default constructor

```
import java.util.*;
class default
{
	int a=10, b=10, c;
	default()
	{
		c=a+b;
		System.out.println("Default constructor called ...");
		System.out.println("Addition of a and b : " + c);
	}
	public static void main(String[] args)
	{
		default r=new default();
	}
}
```

Output :-

```
Default constructor called ...
Addition of a and b : 20
Press any key to continue . . .
```

b) Parameterized constructor

```
import java.util.*;
class parameterized
{
	parameterized(int a, int b)
	{
		int c=a+b;
		System.out.println("Parameterized constructor called ...");
		System.out.println("Addition of a and b : " + c);
	}
	public static void main(String[] args)
	{
		parameterized r=new parameterized(5, 10);
	}
}
```

Output :-

```
Parameterized constuctor called ...
Additon of a and b : 15
Press any key to continue . . .
```

7. Write a program in Java to demonstrate various operations on string functions.

```
import java.util.*;

class string

{

	public static void main(String[] args)

	{

		String a="RCP";

		String b="imrd";

		System.out.println(a.toLowerCase());

		System.out.println(b.toUpperCase());

		System.out.println(a.concat(b));

		System.out.println(b.length());

		System.out.println(b.trim());

		System.out.println(a.isEmpty());

		System.out.println(a.equals(b));

		System.out.println(b.replace('d','D'));

		System.out.println(a.charAt(2));

		System.out.println(b.indexOf('m'));

	}

}
```

Output :-

```
rcp
IMRD
RCPimrd
4
imrd
false
false
imrD
P
1
Press any key to continue . . .
```

8. Write a program in Java to demonstrate wrapper classes.

a) Autoboxing

```
import java.util.*;
public class wrapp
{
	public static void main(String args[])
	{
		int a=20;
		Integer i=Integer.valueOf(a);
		Integer j=a;
		System.out.println(a+"\n"+i+"\n"+j);
	}
}
```

Output :-

```
20
20
20
Press any key to continue . . .
```

b) Unboxing

```
import java.util.*;
public class abc
{
	public static void main(String args[])
	{
		Integer a=new Integer(3);
		int i=a.intValue();
		int j=a;
		System.out.println(a+"\n"+i+"\n"+j);
	}
}
```

Output :-

9. Write a program in Java to implement inheritance.

a) Single inheritance

```
import java.util.*;
class inheritance
{
   public void get()
   {
         System.out.println("Hiii ...");
   }
}

class demo extends inheritance
{
   public void disp()
   {
         System.out.println("Hello ...");
   }
}

public class single
{
   public static void main(String[] args)
   {
      demo r = new demo();
      r.get();
      r.disp();
      r.get();
```

```
  }
}
```

Output :-

b) Multilevel inheritance

```
import java.util.*;
class inheritance
{
	public void get()
	{
		System.out.println("Hey");
	}
}

class demo1 extends inheritance
{
	public void disp()
	{
		System.out.println("Hiii");
	}
}

class demo2 extends demo1
{
	public void show()
	{
		System.out.println("Hello");
	}
}

public class multilevel
{
```

```
        public static void main(String[] args)
        {
                demo2 r = new demo2();
                r.get();
                r.disp();
                r.show();
        }
}
```

Output :-

c) Hierarchical inheritance

```
import java.util.*;
class inheritance
{
	public void get()
	{
		System.out.println("Hiii");
	}
}

class demo1 extends inheritance
{
	public void disp()
	{
		System.out.println("Welcome\n");
	}
}

class demo2 extends inheritance
{
	public void show()
	{
		System.out.println("Visit Again");
	}
}

public class hierarchical
{
```

```
        public static void main(String[] args)
        {
                demo1 r = new demo1();
                r.get();
                r.disp();

                demo2 y = new demo2();
                y.get();
                y.show();
        }
}
```

Output :-

10. Write a program in Java to demonstrate exception handling.

```
import java.util.*;
class abc
{
	public static void main(String[] args)
	{
		try
		{
			System.out.println("Try block called ...");
			Scanner r=new Scanner(System.in);
			System.out.print("Enter 1st number : ");
			int a=r.nextInt();
			Scanner x=new Scanner(System.in);
			System.out.print("Enter 2nd number : ");
			int b=x.nextInt();
			int c;
			c=a/b;
			System.out.println(c);
		}
		catch(ArithmeticException c)
		{
			System.out.println("Can't divide by zero");
		}
		finally
		{
			System.out.println("Finally block called ...");
		}
```

```
        }
}
```

Output :-

```
Try block called ...
Enter 1st number : 10
Enter 2nd number : 0
Can't divide by zero
Finally block called ...
Press any key to continue . . .
```

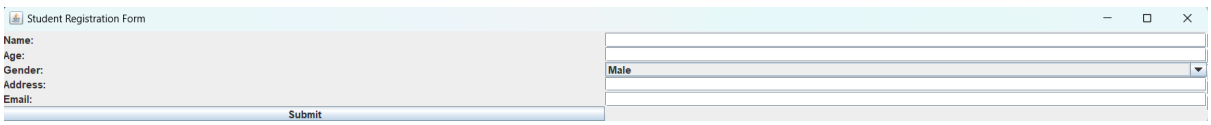
```
Try block called ...
Enter 1st number : 10
Enter 2nd number : 2
5
Finally block called ...
Press any key to continue . . .
```

11. Write awt/Swing program in java to create student's registration form.

```
import javax.swing.*;
import java.awt.*;
import java.awt.event.*;
public class abc extends JFrame implements ActionListener {
   private JLabel nameLabel, ageLabel, genderLabel, addressLabel, emailLabel;
   private JTextField nameField, ageField, addressField, emailField;
   private JComboBox<String> genderComboBox;
   private JButton submitButton;
   public abc() {
      setTitle("Student Registration Form");    setSize(400, 300);
      setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);      nameLabel = new
JLabel("Name:");
      ageLabel = new JLabel("Age:");   genderLabel = new JLabel("Gender:");
      addressLabel = new JLabel("Address:");  emailLabel = new JLabel("Email:");
      nameField = new JTextField(20); ageField = new JTextField(3);
      addressField = new JTextField(20);          emailField = new JTextField(20);
      String[] genders = {"Male", "Female", "Other"}; genderComboBox = new
JComboBox<>(genders);
      submitButton = new JButton("Submit"); setLayout(new GridLayout(6, 2));
      add(nameLabel);              add(nameField);
      add(ageLabel);      add(ageField);
      add(genderLabel);   add(genderComboBox);
      add(addressLabel);  add(addressField);
      add(emailLabel);    add(emailField);
      add(submitButton);  submitButton.addActionListener(this);
      setVisible(true);
   }
```

```
    public void actionPerformed(ActionEvent e) {
        if (e.getSource() == submitButton) {
            String name = nameField.getText();
            int age = Integer.parseInt(ageField.getText());
            String gender = (String) genderComboBox.getSelectedItem();
            String address = addressField.getText();
            String email = emailField.getText();
            String message = "<html><b>Student Information:</b><br>" + "Name: " + name +
"<br>" + "Age: " + age + "<br>" +
            "Gender: " + gender + "<br>" + "Address: " + address + "<br>" + "Email: " + email +
"</html>";
            JOptionPane.showMessageDialog(this, message, "Registration Successful",
JOptionPane.INFORMATION_MESSAGE);
            nameField.setText("");            ageField.setText("");
            genderComboBox.setSelectedIndex(0);          addressField.setText("");
            emailField.setText("");
        }
    }
    public static void main(String[] args) {
        SwingUtilities.invokeLater(new Runnable() {
            public void run() {
                new abc();
            }
        });
    }
}
```

Output :-



12. Write awt/Swing program in java to demonstrate different events.

```
import javax.swing.*;
import java.awt.*;
import java.awt.event.*;
public class abc extends JFrame {
   private JLabel label;
   public abc() {
      setTitle("Mouse Event Demo");
      setSize(500, 300);
      setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
      setLayout(null);
      label = new JLabel();
      label.setBounds(20, 50, 150, 20);
      label.setHorizontalAlignment(SwingConstants.CENTER);
      label.setForeground(Color.WHITE);
      label.setBackground(Color.BLACK);
      label.setOpaque(true);
      add(label);
      addMouseListener(new MouseAdapter() {
         public void mouseClicked(MouseEvent e) {
            label.setText("Mouse Clicked");
            getContentPane().setBackground(Color.MAGENTA);
         }
         public void mouseEntered(MouseEvent e) {
            label.setText("Mouse Entered");
            getContentPane().setBackground(Color.YELLOW);
         }
```

```
        public void mouseReleased(MouseEvent e) {
            label.setText("Mouse Released");
            getContentPane().setBackground(Color.ORANGE);
        }
    });
    setVisible(true);
  }
  public static void main(String[] args) {
    SwingUtilities.invokeLater(() -> new abc());
  }
}
```

Output :-

13. Write program in java to demonstrate text stream object that take input from user and write it into text file.

```
import java.io.*;
public class abc
{
   public static void main(String[] args)
   {
      try
      {
        BufferedReader reader = new BufferedReader(new InputStreamReader(System.in));
         System.out.println("Enter text to write into the file (type 'exit' to quit) : ");
         FileWriter writer = new FileWriter("output.txt");
         String line;
         while (!(line = reader.readLine()).equalsIgnoreCase("exit"))
         {
            writer.write(line + "\n");
         }
         writer.close();
         reader.close();
         System.out.println("Text written to the file successfully.");
      }
      catch (IOException e)
      {
         System.out.println("An error occurred: " + e.getMessage());
      }
   }
}
```

Output :-

```
Enter text to write into the file (type 'exit' to quit) : hi
exit
Text written to the file successfully.
Press any key to continue . . .
```