4.1

```java
import java.io.*;
import java.util.*;
import java.net.*;

class client
{
 public static void main(String args[])
  {
   try
    {
     Socket s=new Socket("localhost",8001);
     System.out.println("Connected to server");
     while(true)
      {
       BufferedReader io=new BufferedReader(new InputStreamReader(System.in));
       System.out.println("Enter a number(otherwise exit) : ");
       String s1=io.readLine();
       PrintWriter p=new PrintWriter(s.getOutputStream(),true);
       p.println(s1);
       if(s1.compareTo("exit")==0)
        {
         System.exit(0);
        }
       BufferedReader b1=new BufferedReader(new InputStreamReader(s.getInputStream()));
       String s2=b1.readLine();
       System.out.println("Factorial of "+s1+" is "+s2);
      }
    }
   catch(Exception e)
    {
     System.out.println(e);
    }
  }
}
```

```java
import java.io.*;
import java.util.*;
import java.net.*;

class server
{
 public static void main(String args[])
  {
   try
    {
     int f=1;
     ServerSocket s=new ServerSocket(8001);
     Socket c=s.accept();
     System.out.println("Connected to client");
     while(true)
      {
       BufferedReader b1=new BufferedReader(new InputStreamReader(c.getInputStream()));
       String s1=b1.readLine();
       int num=Integer.parseInt(s1);
       if(s1.compareTo("exit")==0)
        {
         System.exit(0);
        }
       while(num>1)
        {
         f=num*f;
         num--;
        }
       PrintWriter p=new PrintWriter(c.getOutputStream(),true);
       p.println(f);
      }
    }
   catch(Exception e)
    {
     System.out.println(e);
    }
  }
}
```

4.1 op

D:\OS\Lab 4\4.1>javac client.java

D:\OS\Lab 4\4.1>java client
Connected to server
Enter a number(otherwise exit) :
5
Factorial of 5 is 120
Enter a number(otherwise exit) :
exit

D:\OS\Lab 4\4.1>javac server.java

D:\OS\Lab 4\4.1>java server
Connected to client
java.lang.NumberFormatException: For input string: "exit"

D:\OS\Lab 4\4.1>

4.3 op

D:\OS\Lab 4\4.3>javac server.java

D:\OS\Lab 4\4.3>java server
Connected to client
java.net.SocketException: Connection reset

D:\OS\Lab 4\4.3>

D:\OS\Lab 4\4.3>javac client.java

D:\OS\Lab 4\4.3>java client
Connected to server
Enter a String(otherwise exit) :
malayalam
Result : Palindrome
Enter a String(otherwise exit) :
exit
D:\OS\Lab 4\4.3>

4.2

```java
import java.io.*;
import java.util.*;
import java.net.*;

class client
{
 public static void main(String args[])
  {
   try
    {
     Socket s=new Socket("localhost",8000);
     System.out.println("connected to server");
     while(true)
      {
       BufferedReader io=new BufferedReader(new InputStreamReader(System.in));
       System.out.println("Enter a number 1(otherwise enter exit):");
       String s1 = io.readLine();
       System.out.println("Enter a number 2(otherwise enter exit):");
       String s2 = io.readLine();
       PrintWriter p=new PrintWriter(s.getOutputStream(),true);
       p.println(s1);
       p.println(s2);
       if(s1.compareTo("exit")==0)
        {
         System.exit(0);
        }
       BufferedReader b=new BufferedReader(new InputStreamReader(s.getInputStream()));
       String s3=b.readLine();
       System.out.println("Sum is :"+s3);
      }
    }
   catch(Exception e)
    {
     System.out.println(e);
    }
  }
}
```

```java
import java.io.*;
import java.util.*;
import java.net.*;
class server
{
 public static void main(String args[])
  {
   try
    {
     ServerSocket s=new ServerSocket(8000);
     Socket c=s.accept();
     System.out.println("connected to client");
     while(true)
      {
       int sum=0;
       BufferedReader b=new BufferedReader(new InputStreamReader(c.getInputStream()));
       String s1=b.readLine();
       String s2=b.readLine();
       int num1=Integer.parseInt(s1);
       int num2=Integer.parseInt(s2);
       if(s1.compareTo("exit")==0)
        {
         System.exit(0);
        }
       System.out.println("From client :"+num1);
       System.out.println("From client :"+num2);
       sum=num1+num2;
       PrintWriter p=new PrintWriter(c.getOutputStream(),true);
       p.println(sum);
      }
    }
   catch(Exception e)
    {
     System.out.println(e);
    }
  }
}
```

4.3

```java
import java.io.*;
import java.util.*;
import java.net.*;

class client
{
 public static void main(String args[])
  {
   try
    {
     Socket s=new Socket("localhost",8001);
     System.out.println("Connected to server");
     while(true)
      {
       BufferedReader io=new BufferedReader(new InputStreamReader(System.in));
       System.out.println("Enter a String(otherwise exit) : ");
       String s1=io.readLine();
       PrintWriter p=new PrintWriter(s.getOutputStream(),true);
       p.println(s1);
       if(s1.compareTo("exit")==0)
        {
         System.exit(0);
        }
       BufferedReader b1=new BufferedReader(new InputStreamReader(s.getInputStream()));
       String s2=b1.readLine();
       System.out.println("Result : "+s2);
      }
    }
   catch(Exception e)
    {
     System.out.println(e);
    }
  }
}
```

```java
import java.io.*;
import java.util.*;
import java.net.*;

class server
{
 public static void main(String args[])
  {
   try
    {
     int l,i;
     String s3="",res="";
     ServerSocket s=new ServerSocket(8001);
     Socket c=s.accept();
     System.out.println("Connected to client");
     while(true)
      {
       BufferedReader b1=new BufferedReader(new InputStreamReader(c.getInputStream()));
       String s1=b1.readLine();
       l=s1.length();
       for(i=l-1;i>=0;i--)
        {
         s3=s3+s1.charAt(i);
        }
       if(s3.equals(s1))
        {
         res="Palindrome";
        }
       else
        {
         res="Not Palindrome";
        }
      PrintWriter p=new PrintWriter(c.getOutputStream(),true);
      p.println(res);
      }
    }
   catch(Exception e)
    {
     System.out.println(e);
    }
  }
}
```

4.2 op

D:\OS\Lab 4\4.2>java server
connected to client
From client :5
From client :6
java.lang.NumberFormatException: For input string: "exit"

D:\OS\Lab 4\4.2>

D:\OS\Lab 4\4.2>javac client.java

D:\OS\Lab 4\4.2>java client
connected to server
Enter a number 1(otherwise enter exit):
5
Enter a number 2(otherwise enter exit):
6
Sum is :11
Enter a number 1(otherwise enter exit):
exit
Enter a number 2(otherwise enter exit):
exit

D:\OS\Lab 4\4.2>