EXTRA PROGRAMS

PROGRAM – 1

INPUT :

```java
import java.util.Scanner;
import java.util.*;

interface Inter1
{
    public void dequeue();
    public Boolean isEmpty();
    public void enqueue(int num);
    public int peek();
    public int size();
    public Boolean isFull();
    public void display();
}

class Queue implements Inter1
{
    int arr[];
    int front;
    int rear;
    int capacity;
    int count;

    Queue(int size)
    {
        arr = new int[size];
        capacity = size;
        front = 0;
        rear = -1;
        count = 0;
    }

    public void dequeue()
    {
        if (isEmpty())
        {
            System.out.println("UnderFlow\nProgram Terminated");
```

```java
            System.exit(1);
        }

        System.out.println("Removing " + arr[front]);

        front = (front + 1) % capacity;
        count--;
    }

    public void enqueue(int item)
    {
        if (isFull())
        {
            System.out.println("OverFlow\nProgram Terminated");
            System.exit(1);
        }

        System.out.println("Inserting " + item);

        rear = (rear + 1) % capacity;
        arr[rear] = item;
        count++;
    }

    public int peek()
    {
        if (isEmpty())
        {
            System.out.println("UnderFlow\nProgram Terminated");
            System.exit(1);
        }
        return arr[front];
    }

    public int size()
    {
        return count;
```

```java
    }

    public Boolean isEmpty()
    {
        return (size() == 0);
    }

    public Boolean isFull()
    {
        return (size() == capacity);
    }

    public void display()
    {
    int i;
    if (isEmpty())
        System.out.println("QUEUE EMPTY! Nothing to display!");
    else
    {
        System.out.println("-----QUEUE CONTENTS-----\n");
        for(i = 0; i <= rear; i++)
        System.out.print(arr[i]+"\t");
    }
    }

    public static void main(String[] args)
    {
    Scanner ss = new Scanner(System.in);
    System.out.println("Enter the size of the queue : ");
    int n = ss.nextInt();
    Queue qu = new Queue(n);
    int ch, item;
    do
    {
        System.out.println("\n-----MENU-----\n");
        System.out.println("1. ENQUEUE");
```

Threads.java   OEThread.java   ThreeThreads.java   factexception.java   Accountmain.java   queue.java

```
110         System.out.println("2. DEQUEUE");
111         System.out.println("3. SHOW FIRST ELEMENT");
112         System.out.println("4. SHOW NUMBER OF ELEMENTS");
113         System.out.println("5. DISPLAY");
114         System.out.println("6. EXIT\n");
115         System.out.println("Enter a correct choice!");
116         ch = ss.nextInt();
117         switch(ch)
118         {
119             case 1: System.out.println("Enter the element you want to enqueue :");
120                 item = ss.nextInt();
121                 qu.enqueue(item);
122                 break;
123             case 2: qu.dequeue();
124                 break;
125             case 3:
126                 System.out.println("First element is : "+qu.peek());
127                 break;
128             case 4:
129                 System.out.println("Number of elements in queue is : "+qu.size());
130                 break;
131             case 5: qu.display();
132                 break;
133             case 6: System.out.println("EXITING...");
134                 break;
135             default: System.out.println("INVALID CHOICE!!!");
136         }
137         }
138         while(ch != 6);
139     }
140 }
141
```

OUTPUT :

```
Command Prompt

C:\Users\91944\OneDrive\Desktop\oojlab1\ooj_lab\Week10_ExtraPrograms>java Queue
Enter the size of the queue :
3

-----MENU-----

1. ENQUEUE
2. DEQUEUE
3. SHOW FIRST ELEMENT
4. SHOW NUMBER OF ELEMENTS
5. DISPLAY
6. EXIT

Enter a correct choice!
1
Enter the element you want to enqueue :
11
Inserting 11

-----MENU-----

1. ENQUEUE
2. DEQUEUE
3. SHOW FIRST ELEMENT
4. SHOW NUMBER OF ELEMENTS
5. DISPLAY
6. EXIT

Enter a correct choice!
1
Enter the element you want to enqueue :
22
Inserting 22

-----MENU-----

1. ENQUEUE
2. DEQUEUE
3. SHOW FIRST ELEMENT
4. SHOW NUMBER OF ELEMENTS
5. DISPLAY
6. EXIT

Enter a correct choice!
1
Enter the element you want to enqueue :
33
Inserting 33

-----MENU-----

1. ENQUEUE
2. DEQUEUE
3. SHOW FIRST ELEMENT
4. SHOW NUMBER OF ELEMENTS
5. DISPLAY
6. EXIT

Enter a correct choice!
5
-----QUEUE CONTENTS-----

11      22      33
```
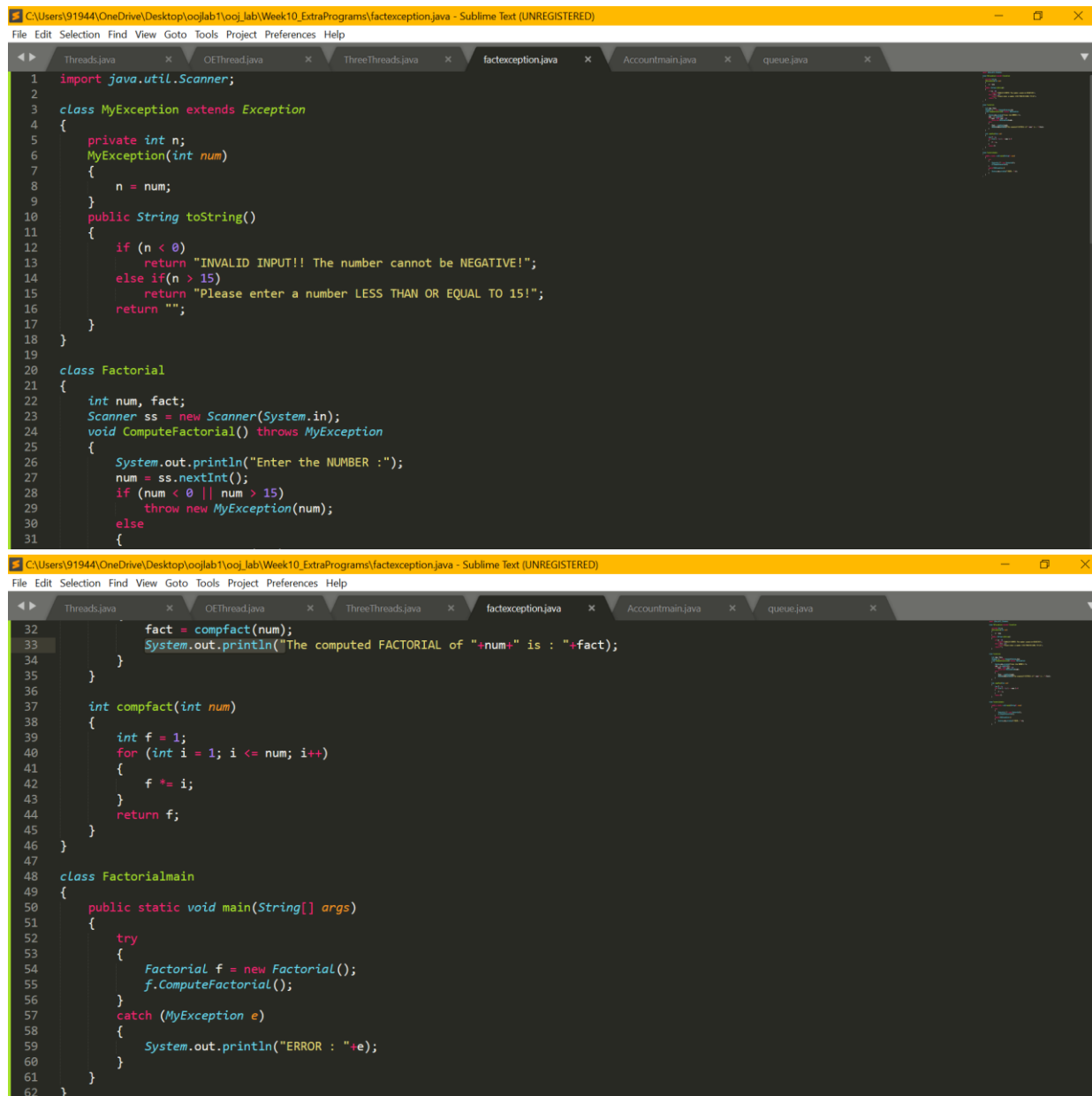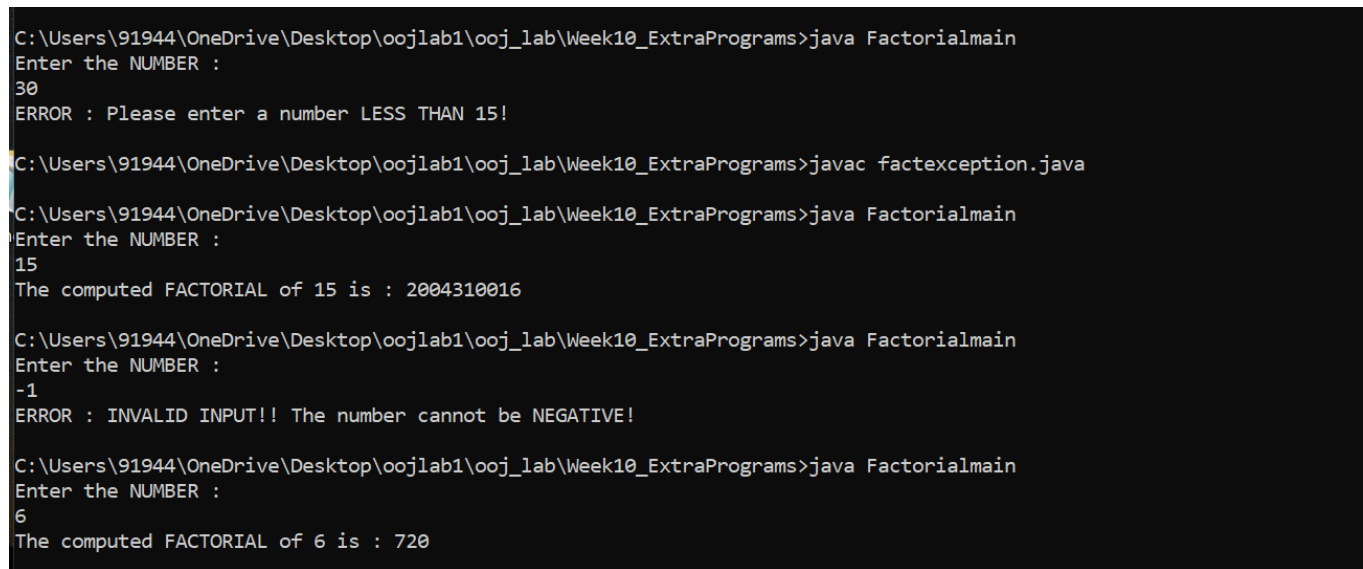
PROGRAM – 2

INPUT :

```java
import java.util.Scanner;

class MyException extends Exception
{
    private int n;
    MyException(int num)
    {
        n = num;
    }
    public String toString()
    {
        if (n < 0)
            return "INVALID INPUT!! The number cannot be NEGATIVE!";
        else if(n > 15)
            return "Please enter a number LESS THAN OR EQUAL TO 15!";
        return "";
    }
}

class Factorial
{
    int num, fact;
    Scanner ss = new Scanner(System.in);
    void ComputeFactorial() throws MyException
    {
        System.out.println("Enter the NUMBER :");
        num = ss.nextInt();
        if (num < 0 || num > 15)
            throw new MyException(num);
        else
        {
            fact = compfact(num);
            System.out.println("The computed FACTORIAL of "+num+" is : "+fact);
        }
    }

    int compfact(int num)
    {
        int f = 1;
        for (int i = 1; i <= num; i++)
        {
            f *= i;
        }
        return f;
    }
}

class Factorialmain
{
    public static void main(String[] args)
    {
        try
        {
            Factorial f = new Factorial();
            f.ComputeFactorial();
        }
        catch (MyException e)
        {
            System.out.println("ERROR : "+e);
        }
    }
}
```

OUTPUT:

```
C:\Users\91944\OneDrive\Desktop\oojlab1\ooj_lab\Week10_ExtraPrograms>java Factorialmain
Enter the NUMBER :
30
ERROR : Please enter a number LESS THAN 15!

C:\Users\91944\OneDrive\Desktop\oojlab1\ooj_lab\Week10_ExtraPrograms>javac factexception.java

C:\Users\91944\OneDrive\Desktop\oojlab1\ooj_lab\Week10_ExtraPrograms>java Factorialmain
Enter the NUMBER :
15
The computed FACTORIAL of 15 is : 2004310016

C:\Users\91944\OneDrive\Desktop\oojlab1\ooj_lab\Week10_ExtraPrograms>java Factorialmain
Enter the NUMBER :
-1
ERROR : INVALID INPUT!! The number cannot be NEGATIVE!

C:\Users\91944\OneDrive\Desktop\oojlab1\ooj_lab\Week10_ExtraPrograms>java Factorialmain
Enter the NUMBER :
6
The computed FACTORIAL of 6 is : 720
```

PROGRAM – 3

INPUT:

```java
import java.util.Scanner;

class Wrongwithdraw extends Exception
{
    private int amt;
    private int wd;
    Wrongwithdraw(int amount, int withdraw)
    {
        amt = amount;
        wd = withdraw;
    }

    public String toString()
    {
        if (amt < 0)
            return "INVALID INPUT!! Account Balance cannot be NEGATIVE!";
        else if (wd < 0)
            return "INVALID INPUT!! Withdrawal amount cannot be NEGATIVE!";
        else if (wd > amt)
            return "INVALID INPUT!! Withdrawal amount should be LESS THAN account balance!";
        return "";
    }
}

class Account
{
    Scanner ss = new Scanner(System.in);
    int bal, withdraw;
    void accept() throws Wrongwithdraw
    {
        bal = 0;
        withdraw = 0;
        System.out.println("\n-----TRANSACTION PRE-REQUISITES-----\n");
        System.out.println("Enter your ACCOUNT BALANCE : ");
        bal = ss.nextInt();
        if (bal < 0)
            throw new Wrongwithdraw(bal, withdraw);
        System.out.println("Enter the WITHDRAWAL AMOUNT :");
        withdraw = ss.nextInt();
        if (withdraw < 0 || withdraw > bal)
            throw new Wrongwithdraw(bal, withdraw);
        else
            display(bal, withdraw);
    }

    void display(int bal, int withdarw)
    {
        bal = bal - withdraw;
        System.out.println("\n-----TRANSACTION SUCCESSFUL-----\n");
        System.out.println("ACCOUNT BALANCE after transaction : "+bal);
        System.out.println("\n----------------------------\n");
    }
}

class Accountmain
{
    public static void main(String[] args)
    {
        try
        {
            Account acc = new Account();
            acc.accept();
        }
        catch(Wrongwithdraw e)
        {
            System.out.println("ERROR : "+e);
        }
    }
}
```

OUTPUT:

```
C:\Users\91944\OneDrive\Desktop\oojlab1\ooj_lab\Week10_ExtraPrograms>java Accountmain

-----TRANSACTION PRE-REQUISITES-----

Enter your ACCOUNT BALANCE :
-100
ERROR : INVALID INPUT!! Account Balance cannot be NEGATIVE!

C:\Users\91944\OneDrive\Desktop\oojlab1\ooj_lab\Week10_ExtraPrograms>java Accountmain

-----TRANSACTION PRE-REQUISITES-----

Enter your ACCOUNT BALANCE :
10000
Enter the WITHDRAWAL AMOUNT :
2500

-----TRANSACTION SUCCESSFUL-----

ACCOUNT BALANCE after transaction : 7500

------------------------------
```