```
*****************************************************************************
******************************************************************
NAME    : Preksha Sheth
ROLL NO : 36
CLASS   : MCA-III
SUBJECT : JAVA
*****************************************************************************
******************************************************************


                          ASSIGNMENT - 1

*****************************************************************************
******************************************************************


                            Part - I

*****************************************************************************
******************************************************************
Q(1).Write a first program in java (Hello World)
*****************************************************************************
******************************************************************
class hello{
     public static void main(String[] args){
           System.out.println("Hello World..");
     }
}


*****************************************************************************
******************************************************************
OUTPUT:

D:\MCA-III\java>java hello.java
Hello World..

*****************************************************************************
******************************************************************
Q(2).Write a program to illustrate the command line Argument.(command
line Arguments)
*****************************************************************************
******************************************************************
class cldemo{
     public static void main(String[] args){
           System.out.println("There are " + args.length + "command -
line arg.");
           System.out.println("They are :");
           for(int i = 0; i < args.length; i++)
           System.out.println("arg [" + i + "] i : " + args[i]);
     }
}

*****************************************************************************
******************************************************************
OUTPUT :
```

```
D:\MCA-III\java>java cldemo.java preksha sheth 36
There are 3command -line arg.
They are :
arg [0] i : preksha
arg [1] i : sheth
arg [2] i : 36
**********************************************************************
**************************************************************
Q(3). Arithmetic Demo..
**********************************************************************
**************************************************************
public class arithmetic{
      public static void main(String args[])
      {
            float i = 5 / 2f;
            //int j = 4 / 2;
            System.out.println(i);
            System.out.print(5/2);
            System.out.print("  "+5 % 2);
            System.out.print("  "+4 / 2);
            System.out.print("  "+4 % 2);
            //System.out.println(j);
            //System.out.println(" "+4 % 2);
      }
}
**********************************************************************
**************************************************************
OUTPUT :

D:\MCA-III\java>java arithmetic.java
2.5
2  1  2  0
**********************************************************************
**************************************************************
Q(4) : Floating Point
**********************************************************************
**************************************************************
class floating_4{
      public static void main(String[] args){
            float price;
            price = 45.35f;
            System.out.print("The price is ");
            System.out.println(price);
      }
}
**********************************************************************
**************************************************************
OUTPUT:

D:\MCA-III\java>java floating_4.java
The price is 45.35

**********************************************************************
**************************************************************
```

```
Q(5-1) :Converting Gallons to Liters..
************************************************************************
********************************************************************
class galTolit{
     public static void main(String[] args){
          double gallons;
          double liters;

          gallons = 10;

          liters = gallons * 3.7854; // convert gallons to liters
          System.out.println(gallons +" Gallons is" + liters + "
liters..");

     }
}
************************************************************************
********************************************************************
OUTPUT:

D:\MCA-III\java>java galTolit.java
10.0 Gallons is37.854 liters..

************************************************************************
********************************************************************
Q(5-2): Improving the Gallons-to-Liters Converter (create a table).
************************************************************************
********************************************************************
class galTolit2{
     public static void main(String[] args){
          double gallons,liters;
          int counter;

          counter = 0;
          for(gallons = 1; gallons <= 20; gallons++)//generate table
upto 50
          {
               liters = gallons * 3.7854;
               System.out.println(gallons + "gallons is " + liters +
"liters..");

               counter++;
               if(counter == 100)
               {
                    System.out.println();
                    counter = 0;
               }
          }
     }
}
************************************************************************
********************************************************************
OUTPUT:

D:\MCA-III\java>java galTolit2.java
```

```
1.0gallons is 3.7854liters..
2.0gallons is 7.5708liters..
3.0gallons is 11.356200000000001liters..
4.0gallons is 15.1416liters..
5.0gallons is 18.927liters..
6.0gallons is 22.712400000000002liters..
7.0gallons is 26.4978liters..
8.0gallons is 30.2832liters..
9.0gallons is 34.0686liters..
10.0gallons is 37.854liters..
11.0gallons is 41.6394liters..
12.0gallons is 45.424800000000005liters..
13.0gallons is 49.2102liters..
14.0gallons is 52.9956liters..
15.0gallons is 56.781liters..
16.0gallons is 60.5664liters..
17.0gallons is 64.3518liters..
18.0gallons is 68.1372liters..
19.0gallons is 71.9226liters..
20.0gallons is 75.708liters..
```

```
************************************************************************
********************************************************************
Q(6): Write a program that illustrates the if statement:(If Demo).
************************************************************************
********************************************************************
class ifdemo{
     public static void main(String[] args){
            int a,b,c;
            a = 2;
            b = 3;

            if(a < b)
                  System.out.println("a is less than b..");
            else
                  System.out.println("b is less than a..");
            System.out.println();

            c = a - b;//c contain -1
            System.out.println("c contain -1");
            if(c >= 0)
                  System.out.println("c is positive..");
            if(c < 0)
                  System.out.println("c is negative..");

            System.out.println();

            c = b - a;//c contain 1
            System.out.println("c contain 1");
            if(c >= 0)
                  System.out.println("c is positive..");
            if(c < 0)
                  System.out.println("c is negative..");
     }
```

```
}
```
****
****
OUTPUT:

D:\MCA-III\java>java ifdemo.java
a is less than b..

c contain -1
c is negative..

c contain 1
c is positive..
****
****
Q(7): Take a list of an array and calculte the min, max and sum of the
elements .
****
****
```java
public class Array {
    public static void main(String[] args) {
        double[] myList = {1.9, 2.9, 3.4, 3.5};

        for(int i = 0; i < myList.length; i++){
            System.out.println(myList[i] + "  ");
        }

        double total = 0;
        for(int i = 0; i < myList.length; i++){
            total +=  myList[i];
        }
        System.out.println("Total: " + total);

        double max = myList[0];
        for(int i = 0; i < myList.length; i++){
            if (myList[i] >  max){
                max = myList[i];
            }
        }
        System.out.println("Max: " + max);

            double min = myList[0];
            for(int i = 0; i < myList.length; i++){
             if (myList[i] <  min){
                min = myList[i];
             }
        }
            System.out.println("Min: " + min);
    }
}
```
****
****
OUTPUT:

```
D:\MCA-III\java>java array.java
1.9
2.9
3.4
3.5
Total: 11.7
Max: 3.5
Min: 1.9
```

****
****

Q(8): Character arithmatic demo ..

****
****

```java
class charArithdemo{
    public static void main(String[] args){
        char ch;

        ch = 'X';
        System.out.println("Ch Contains :" + ch);

        ch++;
        System.out.println("Ch is now :" + ch);

        ch = 90;
        System.out.println("Ch is now :" + ch);
    }
}
```

****
****

OUTPUT:
```
D:\MCA-III\java>java charArithdemo.java
Ch Contains :X
Ch is now :Y
Ch is now :Z
```

****
****

Q(9): sound Demo..

****
****

```java
class sound{
    public static void main(String args[]){
        double dist;
        //light reaches in 7.2 sec. so its distance is in feet
        dist = 7.2 * 1100;
        System.out.println("So Light is " + dist + "Feet away..");
    }
}
```

****
****

OUTPUT:

```
D:\MCA-III\java>java sound.java
So Light is 7920.0Feet away..
```

```
**************************************************************************
*********************************************************************
Q(10): Write a program to understand the effect of nested scopes
(ScopeDemo) .
**************************************************************************
*********************************************************************
class scope{
     public static void main(String[] args){
          int x = 10;
          if(x == 10){
               //start new scope
               int y = 20;//y's scope upto if
               // we can access x and y both here because x is global
and y is local var
               System.out.println("X and Y : " + x + " : " + y);

               x = y * 2;

               System.out.println("Now X is " + x);
          }
          //here y is not accessible & x is accessible
     }
}
**************************************************************************
*********************************************************************
OUTPUT:

D:\MCA-III\java>javac scope.java

D:\MCA-III\java>java scope.java
X and Y : 10 : 20
Now X is 40
**************************************************************************
*********************************************************************
Q(11): Boolean Demo..
**************************************************************************
*********************************************************************
class bool_demo{
     public static void main(String[] args){
          boolean b;
          b = false;
          System.out.println("\nB = " + b);

          b = true;
          System.out.println("\nB = " + b);

          //a boolean val can becontrol using if statement
          if(b) System.out.println("\nThis is executed..");

          b = false;
          if(!b)      System.out.println("\nThis is not executed..");

          //outcome of the relational operator is boolean:
```

```
        System.out.println("\n10 > 9 is " + (10 > 9));
    }
}
```
****
****

OUTPUT:

D:\MCA-III\java>javac bool_demo.java

D:\MCA-III\java>java bool_demo.java

B = false

B = true

This is executed..

This is not executed..

10 > 9 is true

****
****

                            Part - II

****
****
Q(12.)   Write a program to generate a multiplication table
****
****

```
class multiplication_table{
    public static void main(String[] args) {
        int num ;
        num = Integer.parseInt(args[0]);
        System.out.println("num : " + num);

        for(int i=1 ;i <= 10 ;i++){
            System.out.println(num + " * " + i + " = "+ num * i);
        }
    }
}
```

****
****

OUTPUT:

D:\MCA-III\java>javac multiplication_table.java

D:\MCA-III\java>java multiplication_table 13
num : 13
13 * 1 = 13
13 * 2 = 26
13 * 3 = 39

```
13 * 4 = 52
13 * 5 = 65
13 * 6 = 78
13 * 7 = 91
13 * 8 = 104
13 * 9 = 117
13 * 10 = 130
```

```
**************************************************************************
******************************************************************
Q(13.)      BitDemo
**************************************************************************
******************************************************************

public class BitDemo{
    public static void main(String[] args){
        int bitmask = 0x000F;
        int val = 0x2222;
        System.out.println(val & bitmask);
    }
}

**************************************************************************
******************************************************************
OUTPUT:


D:\MCA-III\java>javac BitDemo.java

D:\MCA-III\java>java BitDemo
2

**************************************************************************
******************************************************************
Q(14.)      Write a program to calculate the radius of the pond that will
accommodate 20 fish averaging
      10 inches in length.
**************************************************************************
******************************************************************

public class PondRadius{
    public static void main(String[] args) {
        //calculate the radius of pond:
        //which can hold 20 fishes aveg. 10 inches long

        int fishcount = 20 ;
        int fishlength = 10 ;
        int lengthpersqft = 2 ;
        double radius = 0.0;

        int feet = 0 ;
        int inches = 0 ;
```

```
            double pondarea = (double) (fishcount * fishlength)
/lengthpersqft ;
            radius = Math.sqrt(pondarea / Math.PI);
            feet = (int)Math.floor(radius) ;
            inches = (int)Math.round(12.0 * (radius - feet) );

            System.out.println("To hold " + fishcount + " fish averaging
" + fishlength + " inches long you need a pond with an area of " +
pondarea + " Square feet \n");
            System.out.println("The radius of a pond with area " +
pondarea + " Square feet is " + feet + " feet " + inches + " inches \n");
        }
}
```

```
*************************************************************************
******************************************************************
OUTPUT:

D:\MCA-III\java>javac PondRadius.java

D:\MCA-III\java>java PondRadius
To hold 20 fish averaging 10 inches long you need a pond with an area of
100.0 Square feet

The radius of a pond with area 100.0 Square feet is 5 feet 8 inches
*************************************************************************
******************************************************************
Q(16.)      Arithmetic with Character Code
*************************************************************************
******************************************************************
```

```
public class CharCodeCalcs{
     public static void main(String[] args) {
            char letter1 = 'A';
            char letter2 = (char)(letter1+1);
            char letter3 = letter2 ;

            System.out.println("Here\'s a sequence of letters : " +
letter1 + " " + letter2 + " " + (++letter3) + "\n");

            //letter3 is become c now

            System.out.println("Here are the decimal codes for the
letters : \n" +
                                    letter1 + " : " + (int)letter1 +
                                    "\n"  + letter2 + " : " +
(int)letter2 +
                                    "\n"  + letter3 + " : " +
(int)letter3 );
        }
}
```

```
**************************************************************************
*********************************************************************
OUTPUT:

D:\MCA-III\java>java CharCodeCalcs
Here's a sequence of letters : A B C

Here are the decimal codes for the letters :
A : 65
B : 66
C : 67


**************************************************************************
*********************************************************************
Q(17.) Shift Operators (pg 103 ivor horton)
**************************************************************************
*********************************************************************
import static java.lang.Long.toHexString;
class packchar
{
     public static void main(String[] args)
     {
          char letterA = 'A';
          char letterB = 'B';
          char letterC = 'C';
          char letterD = 'D';
          long packed = 0L;
          packed = letterD;
          packed = (packed << 16) | letterC;
          packed = (packed << 16) | letterB;
          packed = (packed << 16) | letterA;
          System.out.println("packed now contains 0x" +
toHexString(packed));

          long mask = 0xFFFF;
          char letter = (char)(packed & mask);

          System.out.println("From right to left the letters in packed
are:");
          System.out.println(" " + letter + " 0x" +
toHexString(letter));
          packed >>= 16;
          letter = (char)(packed & mask);

          System.out.println(" " + letter + " 0x" +
toHexString(letter));
          packed >>= 16;
          letter = (char)(packed & mask);

          System.out.println(" " + letter + " 0x" +
toHexString(letter));
          packed >>= 16;
          letter = (char)(packed & mask);
```

```
            System.out.println(" " + letter + " 0x" +
toHexString(letter));
        }
}


*********************************************************************
*************************************************************
OUTPUT:
D:\MCA-III\java>java packchar.java
packed now contains 0x44004300420041
From right to left the letters in packed are:
A 0x41
B 0x42
C 0x43
D 0x44


*********************************************************************
*************************************************************
Q(18.)      Bitwise Operators (Indicators & Masking)
*********************************************************************
*************************************************************

import static java.lang.Integer.toBinaryString;
public class BitWiseOPs{
     public static void main(String[] args) {
            int indecators = 0xFF07 ;
            int selectBit3 = 0x4; //MAsk to select the 3rd bit

            //Try bitwise AND to select the 3rd bit in indecators

            System.out.println("indecators          =" +
toBinaryString(indecators));
            System.out.println("selectBit3          =" +
toBinaryString(selectBit3));

            indecators &= selectBit3 ;

            System.out.println("indecators &= selectBit3        =" +
toBinaryString(indecators));

            // Try the bitwise OR to switch the third bit on

            indecators = 0xFF09;

            System.out.println("indecators          =" +
toBinaryString(indecators));
            System.out.println("selectBit3          =" +
toBinaryString(selectBit3));

            indecators |= selectBit3 ;

            System.out.println("indecators &= selectBit3        =" +
toBinaryString(indecators));
```

```
            //Now switch the 3rd bit off again

            indecators &= ~selectBit3 ;

            System.out.println("\nThe third bit in the previous value of
indicators" + " has been switched off");
            System.out.println("indicators & ~selectBit3 = " +
toBinaryString(indecators));


        }
}



************************************************************************
*****************************************************************
OUTPUT:


D:\MCA-III\java>javac BitWiseOPs.java

D:\MCA-III\java>java BitWiseOPs
indecators              =1111111100000111
selectBit3              =100
indecators &= selectBit3                 =100
indecators              =1111111100001001
selectBit3              =100
indecators &= selectBit3                 =1111111100001101

The third bit in the previous value of indicators has been switched off
indicators & ~selectBit3 = 1111111100001001

************************************************************************
*****************************************************************
Q(19.)      Methods for operation in bits.
************************************************************************
*****************************************************************


import static java.lang.Long.*;
public class TryBitMEthods{
      public static void main(String[] args) {
            long number = 0xF00000000000000FL;
            System.out.println("Numbers:\n " + toBinaryString(number));
            long result = rotateLeft(number,2);
            System.out.println("Number rotated left 2 bits: \n" +
toBinaryString(result));
            result = rotateRight(number, 3);
            System.out.println("Number rotated right 3 bits: \n" +
toBinaryString(result));
            result = reverse(result);
            System.out.println("Previous result reversed : \n" +
toBinaryString(result));
            System.out.println("Bit count in number :\n" +
bitCount(number));
      }
}
```

```
******************************************************************
************************************************************
OUTPUT:

D:\MCA-III\java>javac TryBitMEthods.java

D:\MCA-III\java>java TryBitMEthods
Numbers:
11110000000000000000000000000000000000000000000000000000001111
Number rotated left 2 bits:
11000000000000000000000000000000000000000000000000000000111111
Number rotated right 3 bits:
11111110000000000000000000000000000000000000000000000000000001
Previous result reversed :
10000000000000000000000000000000000000000000000000000001111111
Bit count in number :
8

******************************************************************
************************************************************
Q(20.)A. Deciphering Characters the Hard Way
******************************************************************
************************************************************

public class LetterCheck{
      public static void main(String[] args) {
            char symbol ='A';
            symbol = (char)(128.0 * Math.random());

            if(symbol >= 'A'){
                  if(symbol<='Z'){
                        System.out.println("You have capital letter" +
symbol);
                  }
                  else{
                        if(symbol >= 'a'){
                              if(symbol<='z'){
                                    System.out.println("You have small
letter" + symbol);
                              }
                              else{
                                    System.out.println("The code is greater
than a but not a letter :\n");
                              }
                        }else{
                              System.out.println("The code is less than a
but not a letter :\n");
                        }
                  }
            }
            else{
                  System.out.println("The code is less than A so it is not
a letter");
```

```
        }
      }
}
```

****
****
OUTPUT:

D:\MCA-III\java>javac LetterCheck.java

D:\MCA-III\java>java LetterCheck
The code is less than A so it is not a letter

****
****
Q(20.) B.   Deciphering Characters the Easy Way
****
****


```
public class LetterCheck2{
     public static void main(String[] args) {
           char symbol ='A';
           symbol = (char) (128.0 * Math.random());

           if(symbol >= 'A' && symbol <= 'Z'){
                System.out.println("You have capital letter : " +
symbol);
           }
           else{
                if(symbol >= 'a' && symbol <= 'z'){
                      System.out.println("You have small letter : " +
symbol);
                }
                else{
                      System.out.println("The code is not a letter :");
                }
           }
     }
}
```

****
****
OUTPUT:

D:\MCA-III\java>javac LetterCheck2.java

D:\MCA-III\java>java LetterCheck2
The code is not a letter :

****
****
Q(20.)C.   Deciphering Characters the trivally

```
**********************************************************************
*******************************************************************

import static java.lang.Character.isLowerCase;
import static java.lang.Character.isUpperCase;

public class LetterCheck3{
     public static void main(String[] args) {
          char symbol ='A';
          symbol = (char) (128.0 * Math.random());

          if(isUpperCase(symbol)){
               System.out.println("You have capital letter :" +
symbol);
          }
          else{
               if(isLowerCase(symbol)){
                    System.out.println("You have small letter :" +
symbol);
               }
               else{
                    System.out.println("The code is not a letter :");
               }
          }
     }
}

**********************************************************************
*******************************************************************
OUTPUT:

D:\MCA-III\java>javac LetterCheck3.java

D:\MCA-III\java>java LetterCheck3
You have capital letter :L
**********************************************************************
*******************************************************************
Q(21.)      Ternary Operator
**********************************************************************
*******************************************************************

class ternaryop
{
     public static void main(String args[])
     {
          int Tales = 10;
          System.out.println("I have " +Tales+ " tales" + (Tales == 10
? "." :"s."));
          Tales++;
          System.out.println("I have " +Tales+ " tales " + (Tales == 10
? "." :"s."));
     }
}
```

```
********************************************************************
***************************************************************
OUTPUT:

D:\MCA-III\java>java  ternaryop.java
I have 10 tales.
I have 11 tales.

********************************************************************
***************************************************************
Q(22.)      Switch case demo
********************************************************************
***************************************************************

public class tryswitch{

      enum Washchoice {cotton,linen,wool,synthetic}

      public static void main(String[] args) {
            Washchoice wash = Washchoice.cotton;

            System.out.println("\n1.Shirts \n2.Sweaters \n3.Socks
\n4.Sheets \n5.Pants\n");

            int clothes = 1 ;

            switch(clothes){
                  case 1:
                        System.out.println("Washing shirts : ");
                        wash = Washchoice.cotton;
                        break;
                  case 2:
                        System.out.println("Washing sweaters : ");
                        wash = Washchoice.wool;
                        break;
                  case 3:
                        System.out.println("Washing socks : ");
                        wash = Washchoice.wool;
                        break;
                  case 4:
                        System.out.println("Washing sheets : ");
                        wash = Washchoice.linen;
                        break;
                  case 5:
                        System.out.println("Washing pants : ");
                        wash = Washchoice.synthetic;
                        break;
                  default:
                        System.out.println("Unknown washing - default
synthetic : ");
                        wash = Washchoice.synthetic;
                        break;
            }
```

```
            // Now select the wash temperature
            System.out.println("Wash is : " + wash);
            switch(wash){
                  case wool :
                        System.out.println("TEmperature is 120 : ");
                        break;
                  case cotton :
                        System.out.println("TEmperature is 170 : ");
                        break;
                  case synthetic :
                        System.out.println("TEmperature is 130 : ");
                        break;
                  case linen :
                        System.out.println("TEmperature is 180 : ");
                        break;
            }
      }
}
```

****
****
OUTPUT:

D:\MCA-III\java>javac tryswitch.java

D:\MCA-III\java>java tryswitch

1.Shirts
2.Sweaters
3.Socks
4.Sheets
5.Pants

Washing shirts :
Wash is : cotton
TEmperature is 170 :

D:\MCA-III\java>

****
****
Q(23.)   Demonstrate numeric for loop
****
****

```java
public class ForLoop{
      public static void main(String[] args) {
            int limit = 20 ;
            int sum = 0 ;

            for (int i = 1 ; i <= limit ; i++ ) {
                  sum += i;
            }
```

```
                System.out.println("Sum = " + sum);
        }
}



*************************************************************************
*******************************************************************
OUTPUT:


D:\MCA-III\java>javac ForLoop.java

D:\MCA-III\java>java ForLoop
Sum = 210

*************************************************************************
*******************************************************************
Q(24.)      Demonstrate Collection-Based for loop
*************************************************************************
*******************************************************************


public class CollectionForLoop{
        enum Season { spring , summer , fall , winter }
        public static void main(String[] args) {
                for (Season season : Season.values() ) {
                        System.out.println("The season is now : " + season) ;
                }
        }
}


*************************************************************************
*******************************************************************
OUTPUT:


D:\MCA-III\java>javac CollectionForLoop.java

D:\MCA-III\java>java CollectionForLoop
The season is now : spring
The season is now : summer
The season is now : fall
The season is now : winter


*************************************************************************
*******************************************************************
Q(25.)      Demonstrate while loop
*************************************************************************
*******************************************************************


public class WhileLoop{
        public static void main(String[] args) {
                int limit = 20 ;
                int sum = 0 ;
                int i = 1 ;
                while(i <= limit){
```

```
                sum += i ;
                i++;
        }
        System.out.println("sum = " + sum);
    }
}


***********************************************************************
******************************************************************
OUTPUT:


D:\MCA-III\java>javac WhileLoop.java

D:\MCA-III\java>java WhileLoop
sum = 210


***********************************************************************
******************************************************************
Q(26.)      Demonstrate Do-While loop
***********************************************************************
******************************************************************

public class DoWhileLoop{
    public static void main(String[] args) {
            int limit = 20 ;
            int sum = 0 ;
            int i = 1 ;

            do{
                sum += i ;
                i++;
            }while(i <= limit);

            System.out.println("Sum = " + sum );
    }
}


***********************************************************************
******************************************************************
OUTPUT:

D:\MCA-III\java>javac DoWhileLoop.java

D:\MCA-III\java>java DoWhileLoop
Sum = 210


***********************************************************************
******************************************************************
Q(27.)      CAlculate factorial
***********************************************************************
******************************************************************

public class Factorial{
```

```
    public static void main(String[] args) {
            long limit = 20L;//Max limit calculate factorials till here
            long factorial = 1L;   //Sores factorial in this var.

            for(long i=1l ; i<= limit ; i++ ){
                factorial =1L;

                for(long factor=2 ;factor <= i ; factor++){
                    factorial *= factor;
                }
                System.out.println(i + "! is " + factorial );
            }


        }
}
```

```
****************************************************************************
****************************************************************
OUTPUT:

D:\MCA-III\java>javac Factorial.java

D:\MCA-III\java>java Factorial
1! is 1
2! is 2
3! is 6
4! is 24
5! is 120
6! is 720
7! is 5040
8! is 40320
9! is 362880
10! is 3628800
11! is 39916800
12! is 479001600
13! is 6227020800
14! is 87178291200
15! is 1307674368000
16! is 20922789888000
17! is 355687428096000
18! is 6402373705728000
19! is 121645100408832000
20! is 2432902008176640000

****************************************************************************
****************************************************************
Q(28.)     Labled continue example
****************************************************************************
****************************************************************
```

```
public class Factorial2{
    public static void main(String[] args) {
            long limit = 20L;//Max limit calculate factorials till here
```

```java
            long factorial = 1L;   //Sores factorial in this var.

            outerloop:
            for(long i=1l ; i<= limit ; i++ ){
                 factorial =1L;

                 for(long j=2L ;j <= i ; j++){
                      if(i>10L && i % 2L == 1L){
                           continue outerloop;
                      }
                      factorial *= j;
                 }
                 System.out.println(i + "! is " + factorial );
            }


       }
}
```

```
****************************************************************************
***************************************************************************
OUTPUT:

D:\MCA-III\java>javac Factorial2.java

D:\MCA-III\java>java Factorial2
1! is 1
2! is 2
3! is 6
4! is 24
5! is 120
6! is 720
7! is 5040
8! is 40320
9! is 362880
10! is 3628800
12! is 479001600
14! is 87178291200
16! is 20922789888000
18! is 6402373705728000
20! is 2432902008176640000
```

```
****************************************************************************
***************************************************************************
Q(29.A.)    Write a program to find all prime no's. from 2 to 50
****************************************************************************
***************************************************************************
```

```java
public class Primes {
      public static void main(String[] args) {
            int max = 50; // The maximum value to be checked
            boolean isPrime = true; // Is true if we find a prime
            // Check all values from 2 to nValues
            for(int i = 2; i <= max; i++) {
```

```
                isPrime=true; // Assume the current i is prime
                for(int j = 2; j < i; j++) {
                      if(i % j == 0) { // This is true if j divides
exactly
                             isPrime = false; // If we got here, it was
an exact division
                             break; // so exit the loop
                      }
                }
                // We can get here through the break, or through
completing the loop
                if(isPrime) // So is it prime?
                      System.out.println(i); // Yes, so output the value
          }
      }
}


**************************************************************************
******************************************************************
OUTPUT:

D:\MCA-III\java>javac Primes.java

D:\MCA-III\java>java Primes
2
3
5
7
11
13
17
19
23
29
31
37
41
43
47


**************************************************************************
******************************************************************
Q(29.B.)    Write a program to find all prime no's. from 2 to 50
**************************************************************************
******************************************************************

public class Primes2{
      public static void main(String[] args) {
            int nvalues = 50 ;
            int i ;
            Outerloop :
            for( i = 2 ; i <= nvalues ; i++){
                  for (int j =2 ;j < i ; j++){
                        if(i%j == 0 ){
```

```
                        continue Outerloop;
                    }
                }
                System.out.println(i);
            }
        }
    }
}
```

```
*************************************************************************
*********************************************************************
OUTPUT:

D:\MCA-III\java>javac Primes2.java

D:\MCA-III\java>java Primes2
2
3
5
7
11
13
17
19
23
29
31
37
41
43
47


*************************************************************************
*********************************************************************
```

Q(30.A.)   Write a program to display a random choice from a set of six
choices for breakfast
        (you could use any set; for example, scrambled eggs, waffles,
fruit, cereal, toast, or yogurt).

```
*************************************************************************
*********************************************************************
```

```java
public class Choiceeg_1{
    public static void main(String[] args) {
        int choices = 0 ;

        choices = (int)(Math.random() * 6.0) ;
        //System.out.println("Choices = " +choices );
        switch(choices){
            case 0 :
                System.out.println("Your breakfast choice is
Scrambled eggs \n ");
                break;
            case 1 :
```

```java
                         System.out.println("Your breakfast choice is
Waffles \n ");
                         break;
                 case 2 :
                         System.out.println("Your breakfast choice is
Fruits \n ");
                         break;
                 case 3 :
                         System.out.println("Your breakfast choice is
Cereal \n ");
                         break;
                 case 4 :
                         System.out.println("Your breakfast choice is Toast
\n ");
                         break;
                 case 5 :
                         System.out.println("Your breakfast choice is
Yogurt \n ");
                         break;
             }
         }
}
```

```
***********************************************************************
*************************************************************
OUTPUT:

D:\MCA-III\java>javac Choiceeg_1.java

D:\MCA-III\java>java Choiceeg_1
Your breakfast choice is Toast


D:\MCA-III\java>java Choiceeg_1
Your breakfast choice is Scrambled eggs


D:\MCA-III\java>java Choiceeg_1
Your breakfast choice is Cereal

***********************************************************************
*************************************************************
Q(30.B.)    When testing whether an integer is a prime, it is sufficient
to try to divide by integers up to
     the square root of the number being tested. Rewrite the program
example from this chapter to use
     this approach .
***********************************************************************
*************************************************************
```

```java
public class Prime_eg2{
     public static void main(String[] args) {
         int n , i = 2 , sqrt = 0;
```

```java
            boolean isprime = true ;
            n = Integer.parseInt(args[0]);
            sqrt = (int)Math.sqrt(n) + 1 ;
            for(i = 2 ; i <= sqrt ; i++){
                if(n % i == 0){
                        isprime = false ;
                        break;
                }
            }
            if(isprime)
                    System.out.println("The no " + n + " is Prime : ");
            else
                    System.out.println("The no " + n + " is not Prime : ");
        }
}
```

****
****
OUTPUT:

D:\MCA-III\java>javac Prime_eg2.java

D:\MCA-III\java>java Prime_eg2 13
The no 13 is Prime :

D:\MCA-III\java>java Prime_eg2 25
The no 25 is not Prime :
****
****
Q(30.C.)   A lottery requires that you select six different numbers from
the integers 1 to 49. Write a
    program to do this for you and generate five sets of entries.
****
****

```java
class NumberSet
{
    public static void main(String[] args)
    {
        int x;
        int a[]=new int[6];
        for(int i=0;i<5;i++)
        {
            for(int j=0;j<6;)
            {
                x=(int)(Math.random()*49+1);//to select random num
between 1-49
                for(int k=0;k<j;k++)
                {
                if(x==a[k]) //if number is already selected then
we have to select again
                {
                        x=(int)(Math.random()*49+1);
```

```
                    k--;
                }
                }
                a[j]=x;
                j++;
                if(x<10) //to print single and double digits with
same space
                        System.out.print(x + " ");
                else
                        System.out.print(x + " ");
            }
            System.out.println("\n");
        }
        }
}
```

```
************************************************************************
**********************************************************************
OUTPUT:

D:\MCA-III\java>javac NumberSet.java

D:\MCA-III\java>java NumberSet
20 40 17 21 46 43

47 29 43 35 13 41

4 21 19 16 8 42

9 23 4 7 31 34

7 31 24 9 32 18

************************************************************************
**********************************************************************
```
Q(30.D.)   Write a program to generate a random sequence of capital
letters that does not include vowels.
```
************************************************************************
**********************************************************************
```

```
class CharSet
{
    public static void main(String[] args)
    {
    char ch;
    int a[]=new int[6];
    ch=(char)(Math.random()*21+65);//to select random character from A-
V as we will print 5 letters
    System.out.println("Random sequence of capital letters without
vowel: ");
    for(int i=0;i<5;i++)
    {
        if(ch == 'A' ||ch == 'E' ||ch == 'I' ||ch == 'O' ||ch == 'U')
        {
```

```
                    ch++;
                    i--;
            }
            else
            {
                    System.out.print(ch+" ");
                    ch++;
            }
        }
        }
}


**********************************************************************
*****************************************************************
OUTPUT:

D:\MCA-III\java>javac CharSet.java

D:\MCA-III\java>java CharSet
Random sequence of capital letters without vowel:
P Q R S T
**********************************************************************
*****************************************************************


                        Part - III

**********************************************************************
*****************************************************************
Q(31.)     Help3.java
**********************************************************************
*****************************************************************

public class Help{
    public static void main(String[] args)
        throws java.io.IOException{
            char choice ;
            System.out.println("Help on : ");
            System.out.println("1. IF");
            System.out.println("2. Switch ");
            System.out.println("Choose one : ");
            choice = (char) System.in.read();

            System.out.println("\n");

            switch(choice) {
                case '1' :
                    System.out.println("The if : \n");
                    System.out.println("if(condition) statement;");
                    System.out.println("else statement;");
                    break;
                case '2':
                    System.out.println("The Switch : \n");
                    System.out.println("switch(expression) { ");
                    System.out.println("case constant : ");
```

```
                System.out.println("statement sequence");
                System.out.println("break;");
                System.out.println("  // ...");
                System.out.println("}");
                break;
            default:
                System.out.println("Selection not found : ");
        }
    }
```

```
**************************************************************************
*********************************************************************
OUTPUT:

D:\MCA-III\java>javac Help.java

D:\MCA-III\java>java Help
Help on :
1. IF
2. Switch
Choose one :
1


The if :

if(condition) statement;
else statement;

**************************************************************************
*********************************************************************
Q(32.)       Rounding Errors
**************************************************************************
*********************************************************************

public class Sqrroot{
    public static void main(String[] args) {
        {
            double num,sroot,rerr;
            for (num = 1.0 ; num < 100.0 ; num++ ) {
                sroot = Math.sqrt(num);
                System.out.println("Square root of " + num + "is :
" + sroot );

                rerr = num - (sroot * sroot );
                System.out.println("Rounding error is : " + rerr
);
                System.out.println();
            }

        }
    }
}
```

```
****************************************************************************
*************************************************************
OUTPUT:

D:\MCA-III\java>javac Sqrroot.java

D:\MCA-III\java>java Sqrroot
Square root of 1.0is : 1.0
Rounding error is : 0.0

Square root of 2.0is : 1.4142135623730951
Rounding error is : -4.440892098500626E-16

Square root of 3.0is : 1.7320508075688772
Rounding error is : 4.440892098500626E-16

Square root of 4.0is : 2.0
Rounding error is : 0.0

Square root of 5.0is : 2.23606797749979
Rounding error is : -8.881784197001252E-16

Square root of 6.0is : 2.449489742783178
Rounding error is : 8.881784197001252E-16

Square root of 7.0is : 2.6457513110645907
Rounding error is : -8.881784197001252E-16

Square root of 8.0is : 2.8284271247461903
Rounding error is : -1.7763568394002505E-15

Square root of 9.0is : 3.0
Rounding error is : 0.0

Square root of 10.0is : 3.1622776601683795
Rounding error is : -1.7763568394002505E-15

Square root of 11.0is : 3.3166247903554
Rounding error is : 0.0

Square root of 12.0is : 3.4641016151377544
Rounding error is : 1.7763568394002505E-15

Square root of 13.0is : 3.605551275463989
Rounding error is : 1.7763568394002505E-15

Square root of 14.0is : 3.7416573867739413
Rounding error is : 0.0

Square root of 15.0is : 3.872983346207417
Rounding error is : -1.7763568394002505E-15
```

Square root of 16.0is : 4.0
Rounding error is : 0.0

Square root of 17.0is : 4.123105625617661
Rounding error is : 0.0

Square root of 18.0is : 4.242640687119285
Rounding error is : 3.552713678800501E-15

Square root of 19.0is : 4.358898943540674
Rounding error is : -3.552713678800501E-15

Square root of 20.0is : 4.47213595499958
Rounding error is : -3.552713678800501E-15

Square root of 21.0is : 4.58257569495584
Rounding error is : 0.0

Square root of 22.0is : 4.69041575982343
Rounding error is : 0.0

Square root of 23.0is : 4.795831523312719
Rounding error is : 3.552713678800501E-15

Square root of 24.0is : 4.898979485566356
Rounding error is : 3.552713678800501E-15

Square root of 25.0is : 5.0
Rounding error is : 0.0

Square root of 26.0is : 5.0990195135927845
Rounding error is : 3.552713678800501E-15

Square root of 27.0is : 5.196152422706632
Rounding error is : 0.0

Square root of 28.0is : 5.291502622129181
Rounding error is : -3.552713678800501E-15

Square root of 29.0is : 5.385164807134504
Rounding error is : 3.552713678800501E-15

```
*****************************************************************************
***********************************************************************
Q(33.)      Loop until S is typed
*****************************************************************************
***********************************************************************

public class ForTest{
    public static void main(String[] args)
        throws java.io.IOException{
            int i = 0;
            char ignore;
            System.out.println("Press S to stop : ");
```

```
        for(i=0;(char)System.in.read() != 'S' ; i++){
           do{
               ignore = (char) System.in.read();
           } while(ignore != '\n');
           System.out.println("Pass #" + i );
        }
     }
}
```

```
*************************************************************************
*********************************************************************
OUTPUT:

D:\MCA-III\java>javac ForTEst.java

D:\MCA-III\java>javac ForTest.java

D:\MCA-III\java>java ForTest
Press S to stop :
a
Pass #0
s
Pass #1
S


*************************************************************************
*********************************************************************
```
Q(34.)   While demo
```
*************************************************************************
*********************************************************************
```

```
public class WhileDemo{
    public static void main(String[] args){
        char ch ;

        //print alphabet using a while loop

        ch = 'a';
        while(ch <= 'z'){
            System.out.println(ch);
            ch++;
        }
    }
}
```

```
*************************************************************************
*********************************************************************
OUTPUT:

D:\MCA-III\java>javac WhileDemo.java

D:\MCA-III\java>java WhileDemo
a
b
```

```
c
d
e
f
g
h
i
j
k
l
m
n
o
p
q
r
s
t
u
v
w
x
y
z
```

```
*******************************************************************************
**********************************************************************

Q(35.)      Do while demo
*******************************************************************************
**********************************************************************


public class ForTest{
    public static void main(String[] args)
        throws java.io.IOException{
            int i = 0;
            char ignore;
            System.out.println("Press S to stop : ");
            for(i=0;(char)System.in.read() != 'S' ; i++){
                do{
                    ignore = (char) System.in.read();
                } while(ignore != '\n');
                System.out.println("Pass #" + i );
            }
        }
}


*******************************************************************************
**********************************************************************
OUTPUT:

D:\MCA-III\java>javac ForTest.java

D:\MCA-III\java>java ForTest
Press S to stop :
a
```

```
Pass #0
s
Pass #1
S

D:\MCA-III\java>javac ForTEst.java

*********************************************************************
***************************************************************
Q(36.)      Guess the letter game
*********************************************************************
***************************************************************

public class Guess{
    public static void main(String[] args)
    throws java.io.IOException{
        char ch,ignore,answer = 'N';
        do{
            System.out.println("I'm thinking of a letter between A and
Z.");
            System.out.println("Can you guess it ? :");

            //Read a character
            ch = (char) System.in.read();

            //discard any other character in input buffer

            do{
                ignore = (char)System.in.read();
            }while(ignore != '\n');

            if(ch == answer)    System.out.println("***Right***");
            else{
                System.out.println("....Sorry you are ");
                if(ch < answer)    System.out.println("too low ");
                else               System.out.println("too high ");
            System.out.println("Try Again");
            }
        }while(answer != ch);
    }
}

*********************************************************************
***************************************************************
OUTPUT:

D:\MCA-III\java>javac Guess.java

D:\MCA-III\java>java Guess
I'm thinking of a letter between A and Z.
Can you guess it ? :
A
....Sorry you are
too low
```

```
Try Again
I'm thinking of a letter between A and Z.
Can you guess it ? :
Z
....Sorry you are
too high
Try Again
I'm thinking of a letter between A and Z.
Can you guess it ? :
N
***Right***


D:\MCA-III\java>

*************************************************************************
****************************************************************
Q(37.)     The ASCII lowercase letters are separated from the uppercase
letters by 32. Thus, to convert
     a lowercase letter to uppercase, subtract 32 from it. Use this
information to write a program that
     reads characters from the keyboard. Have it convert all lowercase
letters to uppercase, and
     all uppercase letters to lowercase, displaying the result. Make no
changes to any other
     character. Have the program stop when the user enters a period. At
the end, have the
     program display the number of case changes that have taken place.

*************************************************************************
****************************************************************
```

```java
public class conv_l_u{
    public static void main(String args[])
    throws java.io.IOException{
        char ch,ignore;
        do{
            System.out.println("Enter a character enter '$' to stop : ")
;
            ch = (char)System.in.read();
            if(ch >= 'A' && ch <= 'Z' ){
                ch+=32;
                System.out.println("Converted character is : " + ch);
            }
            else if(ch >= 'a' && ch <= 'z'){
                ch-=32;
                System.out.println("Converted character is : " + ch);
            }
            do{
                ignore = (char)System.in.read();
            }while(ignore != '\n');
        }while(ch != '$');
    }
}
```

```
***********************************************************************
*******************************************************************
OUTPUT:


D:\MCA-III\java>java conv_l_u
Enter a character :
a
Converted character is : A
Enter a character :
V
Converted character is : v
Enter a character :
$

***********************************************************************
*******************************************************************
```