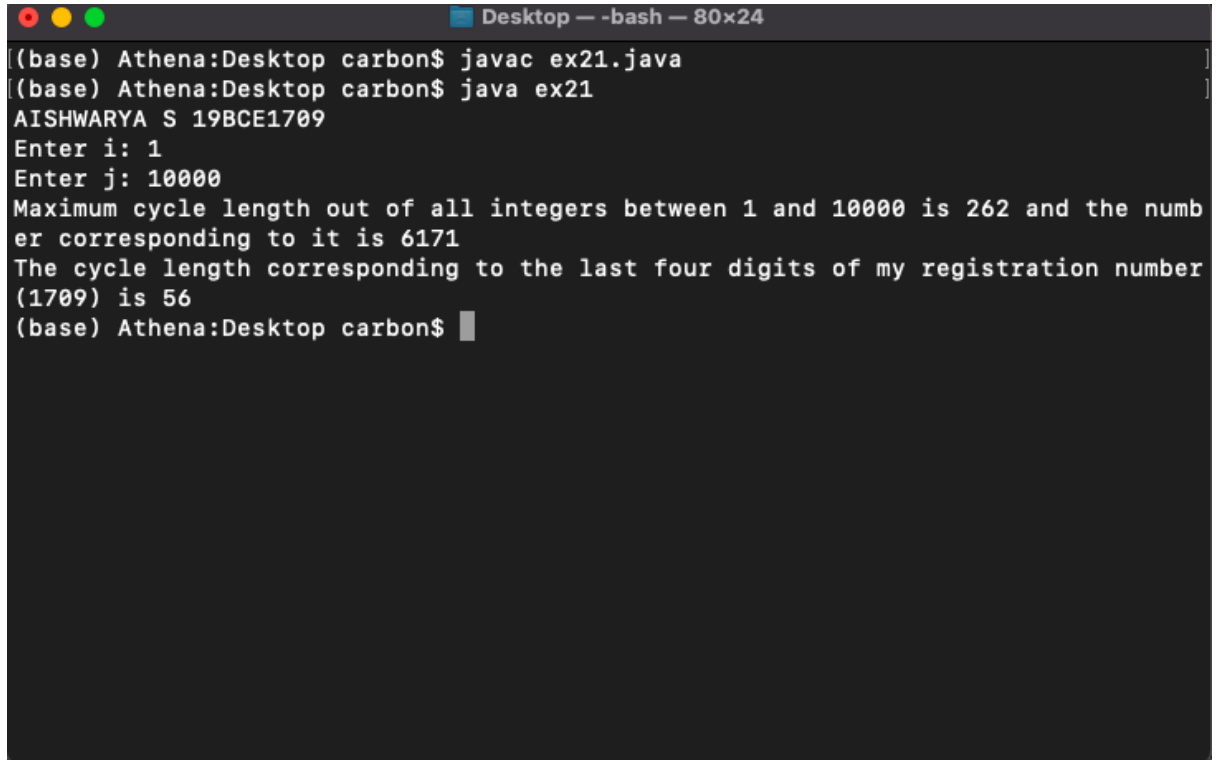


CSE 1007 LAB EX 2

-AISHWARYA S 19BCE1709

1.

OUTPUT



```
[(base) Athena:Desktop carbon$ javac ex21.java ]
[(base) Athena:Desktop carbon$ java ex21 ]
AISHWARYA S 19BCE1709
Enter i: 1
Enter j: 10000
Maximum cycle length out of all integers between 1 and 10000 is 262 and the number corresponding to it is 6171
The cycle length corresponding to the last four digits of my registration number (1709) is 56
(base) Athena:Desktop carbon$
```

CODE:

```
import java.util.*;
import java.lang.*;
class ex21
{
public static void main(String[] args)
{
    System.out.print("AISHWARYA S 19BCE1709\n") ;
    int max=0,m=0,j=0,j1=0;
    Scanner s= new Scanner(System.in);
    int[] a;
    a=new int[100000000];
    a[1]=1;
    System.out.print("Enter i: ") ;
    int i = s.nextInt();
    System.out.print("Enter j: ") ;
    j = s.nextInt();
```

```

        for(int k=i;k<=j;k++)
        {
            m=rec(k,a);
            if(m>max)
            { max= m;
              j1=k;
            }
        }

        System.out.print("Maximum cycle length out of all integers between " +
i+ " and " +j+ " is "+max+" and the number corresponding to it is
"+j1+"\n");

        System.out.print("The cycle length corresponding to the last four
digits of my registration number(1709) is "+ a[1709)+"\n");

    }

    public static int rec(int num, int[] a)
    {

        if(num<1000000000)
        { if(a[num]!=0)
          { return a[num];
          }

          else
          {
              if(num%2==0)
              { a[num]= 1+rec(num/2,a);

              }

              else
              {
                  a[num]=1+rec(num*3+1,a);

              }
              return a[num];
          }

        }

    }

}

```

```

else
{
    if(num%2==0)
    { a[num]= 1+rec(num/2,a);

    }
    else
    {
        a[num]=1+rec(num*3+1,a);

    }
    return a[num];
}

}
}

```

2.

OUTPUT:

```

(base) Athena:Desktop carbon$ javac ex22.java
(base) Athena:Desktop carbon$ java ex22
AISHWARYA S 19BCE1709
Enter the number of batches: 4
Enter the marks for batch 1:
12 12 35 34 16 16 7 8 9
Enter the marks for batch 2:
45 47 34 32 10 11 23 21
Enter the marks for batch 3:
40 11 24 10 9 8 5 12 13 21 20 34 19 17
Enter the marks for batch 4:
12 23 14 5 45 32 12 13 11 10 19 20 21 22 23 23 21 20 19 10
The number of tutors in batch 1 : 2
The number of tutors in batch 2 : 1
The number of tutors in batch 3 : 3
The number of tutors in batch 4 : 5
The resultant array is
Batch 1: 4 3
Batch 2: 4
Batch 3: 4 4 4
Batch 4: 4 4 4 4 2
The total number of batches with exactly 4 members is : 9
(base) Athena:Desktop carbon$

```

CODE:

```
import java.util.*;
import java.lang.*;
class ex22

{   public static void main(String[] args)
    {   int j=0,k=0,n=0,j1=0;

        Scanner s = new Scanner(System.in);
        System.out.print("AISHWARYA S 19BCE1709\n");
        System.out.print("Enter the number of batches: ");
        String l = s.nextLine();
        Scanner l2 = new Scanner(l);
        int no=l2.nextInt();
        int batch[][] = new int[no][] ;

        for(int i=1;i<=no;i++)
        {   j=0;
            System.out.print("Enter the marks for batch "+ i +": \n");

            l = s.nextLine();
            Scanner ls = new Scanner(l);

            while (ls.hasNextInt())
            {
                if(ls.nextInt()<25)
                    j++;
            }

            if(j%4!=0)
            {
                j1=j/4+1;
                batch[i-1]=new int[j1];
                batch[i-1][j1-1]=j%4;
            }
            else
            {
                j1=j/4;
```

```

        batch[i-1]=new int[j1];
        batch[i-1][j1-1]=4;
        n++;
    }

    k=0;
    while(k<j1-1)
    { batch[i-1][k]=4;
        k++;
        n++;
    }

}

k=1;
for (int[] b:batch)
{ System.out.print("The number of tutors in batch "+k+" : "+
b.length+"\n");
    k++;
}

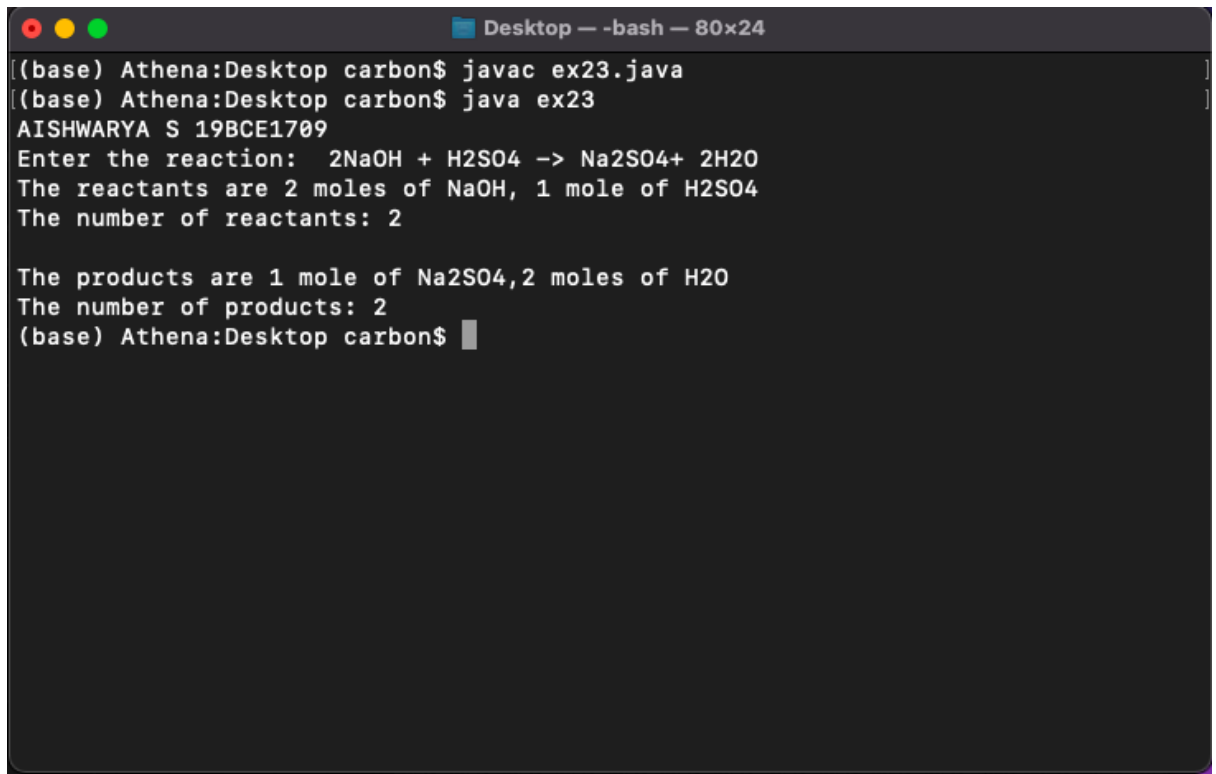
k=1;
System.out.print("The resultant array is \n");
for (int[] b:batch) {
    System.out.print("Batch " +k+": ");
    for (int e : b)
        System.out.print(e + " ");
    System.out.print("\n");
    k++;
}
System.out.print("The total number of batches with exactly 4 members
is : "+ n+ "\n");

}
}

```

3.

OUTPUT:

A terminal window titled "Desktop — -bash — 80x24" showing the execution of a Java program. The user enters 'javac ex23.java' and 'java ex23'. The program outputs the name 'AISHWARYA S 19BCE1709', prompts for a reaction, and then displays the reactants and products with their respective mole counts. The reaction entered is '2NaOH + H2SO4 -> Na2SO4+ 2H2O'. The reactants are identified as 2 moles of NaOH and 1 mole of H2SO4. The products are identified as 1 mole of Na2SO4 and 2 moles of H2O.

```
[(base) Athena:Desktop carbon$ javac ex23.java
[(base) Athena:Desktop carbon$ java ex23
AISHWARYA S 19BCE1709
Enter the reaction: 2NaOH + H2SO4 -> Na2SO4+ 2H2O
The reactants are 2 moles of NaOH, 1 mole of H2SO4
The number of reactants: 2

The products are 1 mole of Na2SO4,2 moles of H2O
The number of products: 2
(base) Athena:Desktop carbon$
```

CODE:

```
import java.util.*;
import java.lang.*;
class ex23
{
    public static void main(String[] args)
    { System.out.print("AISHWARYA S 19BCE1709\n");
      Scanner s= new Scanner(System.in);
      System.out.print("Enter the reaction: ");
      String eq= s.nextLine();
      eq=eq.replaceAll("\\s", "");

      int i=0,re=0,prod=0;

      System.out.print("The reactants are ");
      while(i<eq.length())
      {
          if(Character.isDigit(eq.charAt(i)))
          { System.out.print(eq.charAt(i)+ " moles of ");
            i++;
```

```

    }
    else
    {   System.out.print("1 mole of ");

    }

    while(eq.charAt(i)!='+' && eq.charAt(i)!='-' && i<eq.length())
    {
        System.out.print(eq.charAt(i));
        i++;

    }
    re++;
    if(eq.charAt(i)=='-')
    { i++;
      break;
    }

    i++;
    System.out.print(", ");

}

System.out.print("\nThe number of reactants: "+re+"\n");

System.out.print("\nThe products are ");

while(i<eq.length())
{   i++;
    if(Character.isDigit(eq.charAt(i)))
    {   System.out.print(eq.charAt(i)+ " moles of ");
        i++;
    }
    else
    {   System.out.print("1 mole of ");

    }

    while(eq.charAt(i)!='+')
    {
        System.out.print(eq.charAt(i));
        i++;
        if(i==eq.length())

```

```

        break;

    }

    prod++;
    if(eq.length()!=i)
        {System.out.print(",");}

}

System.out.print("\nThe number of products: "+prod+ "\n");

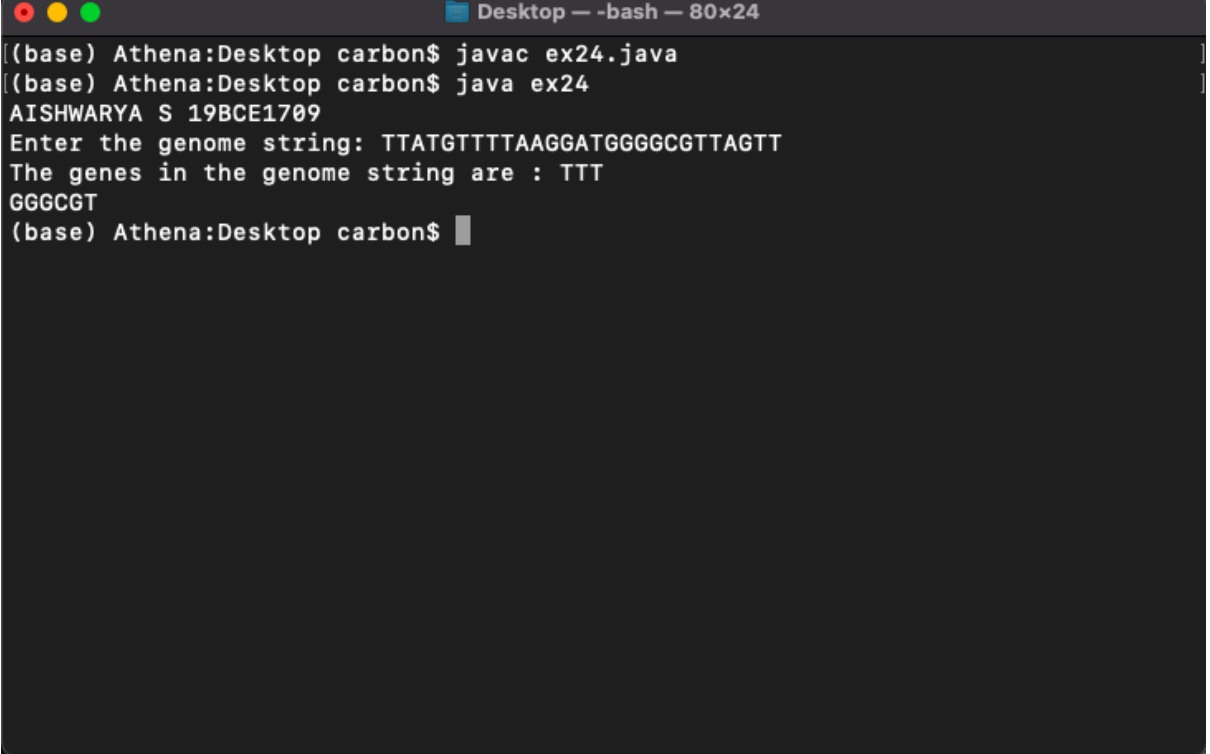
}

}

```

4.

OUTPUT:



```

Desktop — -bash — 80x24
[(base) Athena:Desktop carbon$ javac ex24.java
[(base) Athena:Desktop carbon$ java ex24
AISHWARYA S 19BCE1709
Enter the genome string: TTATGTTTTAAGGATGGGGCGTTAGTT
The genes in the genome string are : TTT
GGGCGT
(base) Athena:Desktop carbon$

```


CODE:

```
import java.util.*;
import java.lang.*;
class ex24
{
    public static void main(String[] args)
    {
        int i=0;

        System.out.print("AISHWARYA S 19BCE1709\n");

        Scanner s= new Scanner(System.in);
        System.out.print("Enter the genome string: ");
        String str= s.nextLine();
        String g1="ATG";
        String g2="TAA";
        String g3="TAG";
        String g4="TGA";

        str=str.replaceAll("\\s", "");

        System.out.print("The genes in the genome string are : ");
        while(i<=str.length()-3)
        {
            String sg=str.substring(i,i+3);
            String gene="";

            if(sg.compareTo(g1)==0)
            {
                i=i+3;
                sg=str.substring(i,i+3);

                while(i<=str.length()-3)
                {
                    sg=str.substring(i,i+3);

                    if(sg.compareTo(g1)==0)
                    {
                        i=i-1;
                        break;
                    }

                    else if (sg.compareTo(g2)==0 || sg.compareTo(g3)==0 ||
sg.compareTo(g4)==0)
```

```
        { break;
        }

        else
        {
            gene=gene+ str.charAt(i);

        }
        i=i+1;

    }

    }

    i=i+1;
    if(gene.length()%3==0&& gene.length()!=0)
        System.out.print(gene+"\n");
}
}
}
```