ASSIGNMENT-3(MATRICES)

20BCSE50_KUMAR_JIJNASU_C1_08

1...

```
import java.util.Random;
import java.util.Scanner;
class Random01 {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the size of the array : ");
        int l = sc.nextInt();
        int arr[]=new int[l];
        System.out.print("The array is : ");
        Random r = new Random();
        for(int i=0;i<l;i++)
        {
            arr[i] = r.nextInt(0, 2);
            System.out.print(arr[i]+", ");
        }
        System.out.print("\nAfter complement the array is : ");
        for(int i=0;i<l;i++)
        {
            arr[i] = (arr[i]+1)%2;
            System.out.print(arr[i]+", ");
        }
        System.out.println();
        sc.close();

    }
}
```

OUTPUT

```
PS C:\Users\MY\Downloads\java\Assignment-3> java Random01.java
Enter the size of the array : 10
The array is : 1, 0, 0, 1, 1, 1, 0, 0, 1, 0,
After complement the array is : 0, 1, 1, 0, 0, 0, 1, 1, 0, 1,
PS C:\Users\MY\Downloads\java\Assignment-3>
```

2...

```java
import java.util.Random;
import java.util.Scanner;
class SwapArrayLastFirst {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the size of the array : ");
        int l = sc.nextInt();
        int a[]=new int[l],b[]=new int[l], k = 0;
        System.out.println("Before SWAPPING the array are : ");
        System.out.print("The first array is : ");
        Random r = new Random();
        for(int i=0;i<l;i++)
        {
            a[i] = r.nextInt(0, 2);
            b[i] = r.nextInt(0, 2);
            System.out.print(a[i]+", ");
        }
        System.out.print("\nThe second array is : ");
        for(int i=0;i<l;i++)
        {
            System.out.print(b[i]+", ");
            if(i>=l/2)
            {
                k = a[i];
                a[i] = b[i];
                b[i] = k;
            }
        }

        System.out.print("\nAfter SWAPPING the array are : ");
        System.out.print("\nThe first array is : ");
        for(int i=0;i<l;i++)
            System.out.print(a[i]+", ");
        System.out.print("\nThe second array is : ");
        for(int i=0;i<l;i++)
            System.out.print(b[i]+", ");
        System.out.println();

        sc.close();
    }
}
```

OUTPUT

```
PS C:\Users\MY\Downloads\java\Assignment-3> java SwapArrayLastFirst.java
Enter the size of the array : 10
Before SWAPPING the array are :
The first array is : 0, 0, 1, 1, 0, 0, 0, 0, 0, 1,
The second array is : 1, 1, 0, 1, 1, 1, 1, 1, 1, 1,
After SWAPPING the array are :
The first array is : 0, 0, 1, 1, 0, 1, 1, 1, 1, 1,
The second array is : 1, 1, 0, 1, 1, 0, 0, 0, 0, 1,
PS C:\Users\MY\Downloads\java\Assignment-3>
```

3...

```java
import java.util.Scanner;
class MatrixMultiply {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the size of the array : ");
        int l = sc.nextInt();
        int a[][] = new int[l][l],b[][] = new int[l][l],c[][] = new
int[l][l],t=0;
        System.out.println("Enter first Matrix : ");
        for(int i=0;i<l;i++)
            for(int j=0;j<l;j++)
                a[i][j] = sc.nextInt();

        System.out.println("Enter second Matrix : ");
        for(int i=0;i<l;i++)
            for(int j=0;j<l;j++)
                b[i][j] = sc.nextInt();


        System.out.println("The first Matrix is : ");
        for(int i=0;i<l;i++)
        {
            for(int j=0;j<l;j++)
                System.out.print(a[i][j]+"  ");
            System.out.println();
        }
        System.out.println("\nThe second Matrix is : ");
        for(int i=0;i<l;i++)
        {
            for(int j=0;j<l;j++)
                System.out.print(b[i][j]+"  ");
```

```
            System.out.println();
        }

        for(int i=0;i<l;i++)
            for(int j=0;j<l;j++)
            {
                c[i][j] = 0;
                for(int k=0;k<l;k++)
                    c[i][j] += a[i][k]*b[k][j];
            }

        System.out.println("\nThe Matrix Multiplication is : ");
        for(int i=0;i<l;i++)
        {
            for(int j=0;j<l;j++)
                System.out.print(c[i][j]+"  ");
            System.out.println();
        }

        sc.close();
    }
}
```

OUTPUT

```
PS C:\Users\MY\Downloads\java\Assignment-3> java MatrixMultiply.java
Enter the size of the array : 3
Enter first Matrix :
1 2 3
4 5 6
7 8 9
Enter second Matrix :
1 0 0
0 1 0
0 0 1
The first Matrix is :
1  2  3
4  5  6
7  8  9

The second Matrix is :
1  0  0
0  1  0
0  0  1

The Matrix Multiplication is :
1  2  3
4  5  6
7  8  9
PS C:\Users\MY\Downloads\java\Assignment-3>
```

4...

```java
import java.util.Scanner;
class Transpose {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the size of the array : ");
        int l = sc.nextInt();
        int a[][] = new int[l][l],b[][] = new int[l][l];
        System.out.println("Enter the Matrix : ");
        for(int i=0;i<l;i++)
            for(int j=0;j<l;j++)
                a[i][j] = sc.nextInt();


        System.out.println("The Matrix is : ");
        for(int i=0;i<l;i++)
        {
            for(int j=0;j<l;j++)
                System.out.print(a[i][j]+"  ");
            System.out.println();
        }

        for(int i=0;i<l;i++)
            for(int j=0;j<l;j++)
                b[i][j] = a[j][i];

        System.out.println("\nThe transpose of the Matrix is : ");
        for(int i=0;i<l;i++)
        {
            for(int j=0;j<l;j++)
                System.out.print(b[i][j]+"  ");
            System.out.println();
        }
        sc.close();

    }
}
```

OUTPUT

```
PS C:\Users\MY\Downloads\java\Assignment-3> java Transpose.java
Enter the size of the array : 3
Enter the Matrix :
1 2 3
4 5 6
7 8 9
The Matrix is :
1  2  3
4  5  6
7  8  9

The transpose of the Matrix is :
1  4  7
2  5  8
3  6  9
PS C:\Users\MY\Downloads\java\Assignment-3>
```

5...

```java
import java.util.Scanner;
class DiagonalSum {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the size of the array : ");
        int l = sc.nextInt(),mains=0,rights=0;
        int a[][] = new int[l][l],b[][] = new int[l][l];
        System.out.println("Enter the Matrix : ");
        for(int i=0;i<l;i++)
            for(int j=0;j<l;j++)
                a[i][j] = sc.nextInt();


        System.out.println("The Matrix is : ");
        for(int i=0;i<l;i++)
        {
            for(int j=0;j<l;j++)
                System.out.print(a[i][j]+"  ");
            System.out.println();
        }

        for(int i=0;i<l;i++)
            for(int j=0;j<l;j++)
            {
                if(i==j)
                    mains += a[j][i];
```

```
                if(i+j==l-1)
                    rights += a[i][j];
            }

        System.out.println("\nThe sum of main diagonal is : "+mains);
        System.out.println("The sum of right diagonal is : "+rights);
        sc.close();

    }
}
```

OUTPUT

```
PS C:\Users\MY\Downloads\java\Assignment-3> java DiagonalSum.java
Enter the size of the array : 3
Enter the Matrix :
1 2 3
4 5 6
7 8 9
The Matrix is :
1  2  3
4  5  6
7  8  9

The sum of main diagonal is : 15
The sum of right diagonal is : 15
PS C:\Users\MY\Downloads\java\Assignment-3>
```

6...

```
import java.util.*;
class BinarySwap
{
    public static void main(String args[])
    {
        int a[]=new int[10];
        int b[]=new int[10];
        Scanner sc=new Scanner(System.in);
        int i,c=0;
        System.out.println("Enter either 1 or 0 in the 1st array");
        for(i=0;i<10;i++)
        a[i]=sc.nextInt();
        System.out.println("Enter either 1 or 0 in the 2nd array");
        for(i=0;i<10;i++)
        b[i]=sc.nextInt();
        System.out.println("Before Flipping array elements of 1st array: ");
        for(i=0;i<10;i++)
```

```
        System.out.print(a[i]+" ");
        System.out.println("\nBefore Flipping array elements of 2nd array: ");
        for(i=0;i<10;i++)
        System.out.print(b[i]+" ");
        c=a[4];
        a[4]=b[2];
        b[2]=c;
        c=a[6];
        a[6]=b[3];
        b[3]=c;
        c=a[7];
        a[7]=b[4];
        b[4]=c;
        System.out.println("\nAfter Flipping array elements : ");
        for(i=0;i<10;i++)
            System.out.print(a[i]+" ");
            System.out.println("\nAfter Flipping array elements : ");
        for(i=0;i<10;i++)
            System.out.print(b[i]+" ");
    }

}
```

OUTPUT

```
PS C:\Users\MY\Downloads\java\Assignment-3> java BinarySwap.java
Enter either 1 or 0 in the 1st array
1 0 1 0 1 0 1 0 1 0
Enter either 1 or 0 in the 2nd array
0 1 0 1 0 1 0 1 0 1
Before Flipping array elements of 1st array:
1 0 1 0 1 0 1 0 1 0
Before Flipping array elements of 2nd array:
0 1 0 1 0 1 0 1 0 1
After Flipping array elements :
1 0 1 0 0 0 1 0 1 0
After Flipping array elements :
0 1 1 1 0 1 0 1 0 1 PS C:\Users\MY\Downloads\java\Assignment-3>
```