Faculty : Mr. Tarek Mizan
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Class Timing: ST 1:00 PM – 2:30 PM (LIB-611)
Topic: Array

Objective

1. Introduction to Arrays.
2. Single and Multi-Dimensional Arrays
3. Array with different colum length

One Dimensional Array:

```
    Syntax :

    dataType [ ] myList;  // or double myList [ ];
    dataType [ ] myList = new double[3];
    double [ ] myList = {1.9, 2.9, 3.4, 3.5};
```

Two Dimensional Array:

```
    Syntax :

    dataType arrayRefVar [ ] [ ];  // dataType[ ] [ ] arrayRefVar;
    int [ ] [ ] arr = new int [3] [3];  //3 rows and 3 columns
    // declaring and initializing 2D array:
    int arr [ ] [ ] = { {1,2,3}, {2,4,5}, {4,4,5} };
```

Array01.java

```
public class Array01 {
    public static void main(String[] args) {
        int size, item, count = 0;

        Scanner sc = new Scanner(System.in);

        System.out.print("Input size of array: ");
        size = sc.nextInt();
```

```
        int[] arr = new int[size];

        System.out.print("Input elements in array: ");
        for (int i = 0; i < arr.length; i++) {
            arr[i] = sc.nextInt();
        }

        System.out.println("Element to search?");
        item = sc.nextInt();
        sc.close();

        for (int i = 0; i < arr.length; i++) {
            if (arr[i] == item)
                count++;

        }

        if (count > 0)
            System.out.println("Element found " + count + " times.");
        else
            System.out.println("Element not found.");
    }

}
```

Array02.java

```
public class Array02 {
    public static void main(String[] args) {
        int row;
        double[][] arr;
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter lenght of row : ");
        row = sc.nextInt();
        arr = new double[row][];
        for (int i = 0; i < arr.length; i++) {
            System.out.print("Enter cloumn lenght of row " + (i + 1) + " :
");
            int j = sc.nextInt();
            arr[i] = new double[j];
        }

        for (double[] ds : arr) {

            System.out.print("Enter value of row " + j + " : ");
            for (int i = 0; i < ds.length; i++) {

                ds[i] = sc.nextDouble();
            }
```

```
        }

        sc.close();

        System.out.println("Array : ");
        for (double[] ds : arr) {

            for (int i = 0; i < ds.length; i++) {

                System.out.print(ds[i] + "\t");
            }
            System.out.println();
        }

    }
}
```

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Topic: Loops, Jump

Tasks:

1. Take N students' marks as input and store them in array. Then find the average marks. Finally, find and print how many of them got above average marks and how many of them got below the average.

```
Enter number of students : 5
Enter marks of students 1 : 50
Enter marks of students 2 : 60
Enter marks of students 3 : 70
Enter marks of students 4 : 75
Enter marks of students 5 : 90
Average is : 69.0
3 of them got above average.
2 of them got below average.
```

2. Take input of a N x N matrix and display the sum of its main diagonal element. N will also be input. Example: For the following matrix, your program should display 12. (Because 5+3+4 = 12)

```
Sample Input:                    Sample Output
N = 3
5 2 1                            12
0 3 7
6 8 4
```

3. In this task, you will find the transpose of a matrix. Read two integers, m, and n, from the user. These are the dimensions of the matrix. Next, read the elements of the matrix from the user. Then, print the transpose of the matrix.

```
Sample Input :              Sample Output :
Enter rows:3                Transpose:
Enter columns: 4            2     4     9
Enter Matrix Elements:      3     8     0
2 3 6 7                     6     1     7
4 8 1 5                     7     5     2
9 0 7 2
```