CSE1007-JAVA PROGRAMMING-LAB

EXERCISE-01

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Question 1a

Problem:

Write a JAVA program to calculate the sum and average of the array elements of the numeric array.

Aim:

To calculate the sum of all the array elements then use the sum value to calculate the average of the array elements that have been entered by the user as input.

Algorithm:

1. Start
2. Create a class
3. Create a main method
4. Create a Scanner class for taking inputs
5. Ask the user to input the size of the array and store it in variable l
6. Initialize an integer type array of size l
7. Set the value of variable s to 0
8. Run a loop starting with i = 0 to i<l
9. Ask the user to input an array element
10. For each input increment the value of s by the user input
11. After the loop is completed, display the value of s as sum
12. Calculate the average by dividing s/l and storing it in a double type variable avg
13. Display the avg as average
14. Stop

Code:

```
import java.util.*;

class AvgArray {

   public static void main(String args[]) {


      Scanner x = new Scanner(System.in) ;
```

```
        System.out.println("Enter the array length");
        int l = x.nextInt();
        int arr[] = new int[l];
        int i;int s =0;
        System.out.println("Enter elements");
        for(i=0;i<l;i++){
           arr[i]=x.nextInt();
           s=s+arr[i];
        }
        float avg = s/l;
        System.out.println("Sum ="+s);
        System.out.println("Average ="+avg);

    }

}
```

Output:

```
C:¥Users¥kulvir¥Desktop¥JAVA CODes>javac AvgArray.java

C:¥Users¥kulvir¥Desktop¥JAVA CODes>java AvgArray
Enter the array length
4
Enter elements
10
20
30
40
Sum =100
Average =25.0
```

Result:

The program successfully calculates the sum and average of all the array elements entered by the user.

Question 1b

Problem:

Write a Java program that sorts the elements of the array (String as well as numeric)

Aim:

To use sorting algorithms to sort the numeric array and the string array.

Algorithm:

1. Start
2. Create a class
3. Create a main method
4. Create Scanner class object to obtain user input
5. Create an integer type array of size n where n is input from the user
6. Enter element into the array using loop
7. Initialize an integer type variable temp and assign it to 0
8. Use the Bubble Sort Algorithm and sort the array DESCENDING order
9. Display the sorted array
10. Stop

Code: NUMERIC SORTING

```
import java.util.*;

class Sorting {

   public static void main(String[] args) {

      Scanner x = new Scanner(System.in);

      System.out.println("Enter the array length");

      int n = x.nextInt();

      int arr[] = new int[n];

      int i;

      System.out.println("Enter elements");
```

```
        for(i=0;i<n;i++){
            arr[i]=x.nextInt();
        }
        int j;int temp=0;
        for(i=0;i<n-1;i++){
            for(j=0;j<n-i-1;j++){
                if(arr[i]>arr[j]){
                    temp = arr[i];
                    arr[i]=arr[j];
                    arr[j]=temp;
                }
            }
        }
        System.out.println("Sorted array is:");
        for(i=0;i<n;i++){
            System.out.print(arr[i]+" , ");
        }
        System.out.println();
    }
}
```

Output:

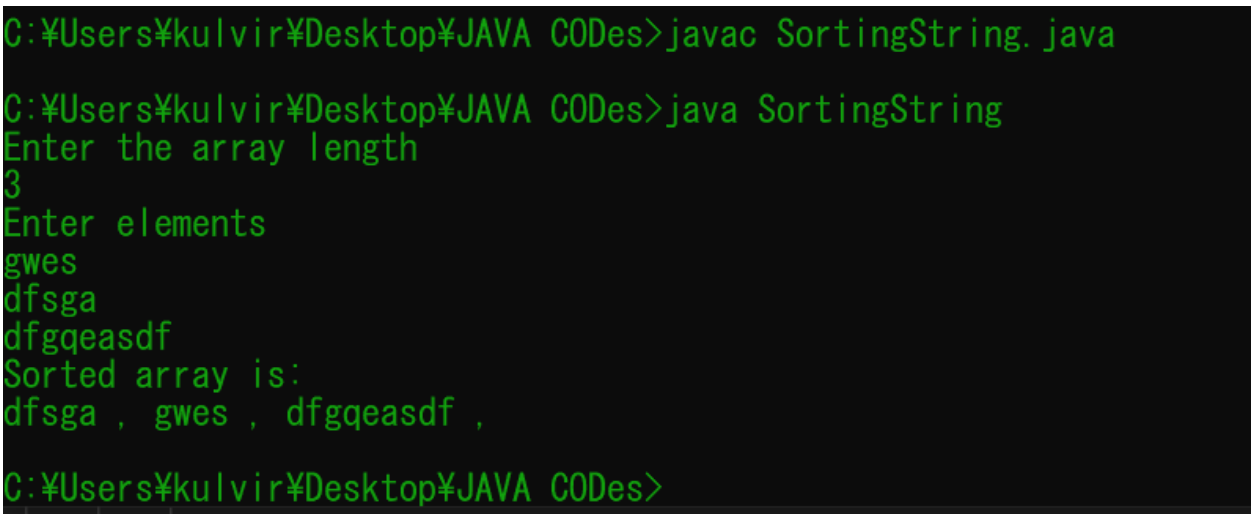
```
C:¥Users¥kulvir¥Desktop¥JAVA CODes>javac Sorting.java

C:¥Users¥kulvir¥Desktop¥JAVA CODes>java Sorting
Enter the array length
3
Enter elements
23
54
3
Sorted array is:
54 , 23 , 3 ,
```

Code: STRING SORTING

```
import java.util.*;
 class SortingString {
    public static void main(String[] args) {
       Scanner x = new Scanner(System.in);
       System.out.println("Enter the array length");
       int n = x.nextInt();
       String arr[] = new String[n];
       int i;
       System.out.println("Enter elements");
       for(i=0;i<n;i++){
          arr[i]=x.next();
       }
       int j;String temp="";
       for(i=0;i<n-1;i++){
          for(j=0;j<n-i-1;j++){
             if(arr[i].compareTo(arr[j])<0){
                temp = arr[i];
                arr[i]=arr[j];
                arr[j]=temp;
             }
          }
       }
       System.out.println("Sorted array is:");
       for(i=0;i<n;i++){
          System.out.print(arr[i]+" , ");
       }
       System.out.println();
```

```
    }
}
```

Output:



Result:

The code successfully sorts the integer and string array in ascending as well as descending order.

Question 2

Problem:

Write a Java program to find out the common strings and print them

Aim:

To display the common strings from 2 string arrays that are input from the user

Algorithm:

1. Start
2. Initialize a string array arr1 of size 5
3. Initialize a string array arr2 of size 5
4. Take user input and enter elements in both the arrays
5. Run a loop till i<5 starting with i=0
6. Run a nested loop inside the above loop from j=0 to j<5
7. Check if arr1[i] is same (ignore case) as arr2[j]
8. If 7 is true then display arr1[i] and replace it with empty string
9. Else continue
10. Stop

Code:

```
import java.util.*;
class CommonElements2arr {
   public static void main(String[] args) {
      Scanner x = new Scanner(System.in);
      String arr1[] = new String[5] ;
      String arr2[] = new String[5] ;
      System.out.println("enter 5 elements in array 1")  ;
      int i;int j;
      for(i=0;i<5;i++)
      {
         arr1[i]=x.nextLine();
      }
      System.out.println("enter 5 elements in array 2")  ;
      for(i=0;i<5;i++)
      {
         arr2[i]=x.nextLine();
      }
      System.out.println("Common Elements are:");
      for(i=0;i<5;i++){
         for(j=0;j<5;j++){
            if(arr1[i].equalsIgnoreCase(arr2[j])){
               System.out.print(arr1[i]+" ,");
               arr1[i]="";
            }
         }
      }
   }
   }
```

Output:

```
C:¥Users¥kulvir¥Desktop¥JAVA CODes>javac CommonElements2arr.java

C:¥Users¥kulvir¥Desktop¥JAVA CODes>java CommonElements2arr
enter 5 elements in array 1
abc
def
das
dfsd
asd
enter 5 elements in array 2
abc
fadfs
dsa
das
fas
Common Elements are:
abc ,das ,
C:¥Users¥kulvir¥Desktop¥JAVA CODes>
```

Result:

The code successfully prints the common strings from the 2 arrays entered by the user.

Question 3

Problem:

Write a Java program to perform matrix addition of 2 matrices.

Aim:

To calculate the matrix which is the sum of two matrices of 2X2 order by applying the mathematical rule of matrix addition

Algorithm:

1. Start
2. Initialize mat1[][] a double dimension arrays of integer data type of size 2 by 2
3. Initialize mat2[][] a double dimension arrays of integer data type of size 2 by 2
4. Initialize mat3[][] a double dimension arrays of integer data type of size 2 by 2
5. Take input from the user into the double dimension array mat1[][]
6. Take input from the user into the double dimension array mat2[][]
7. Run a loop from i=0 to i<2

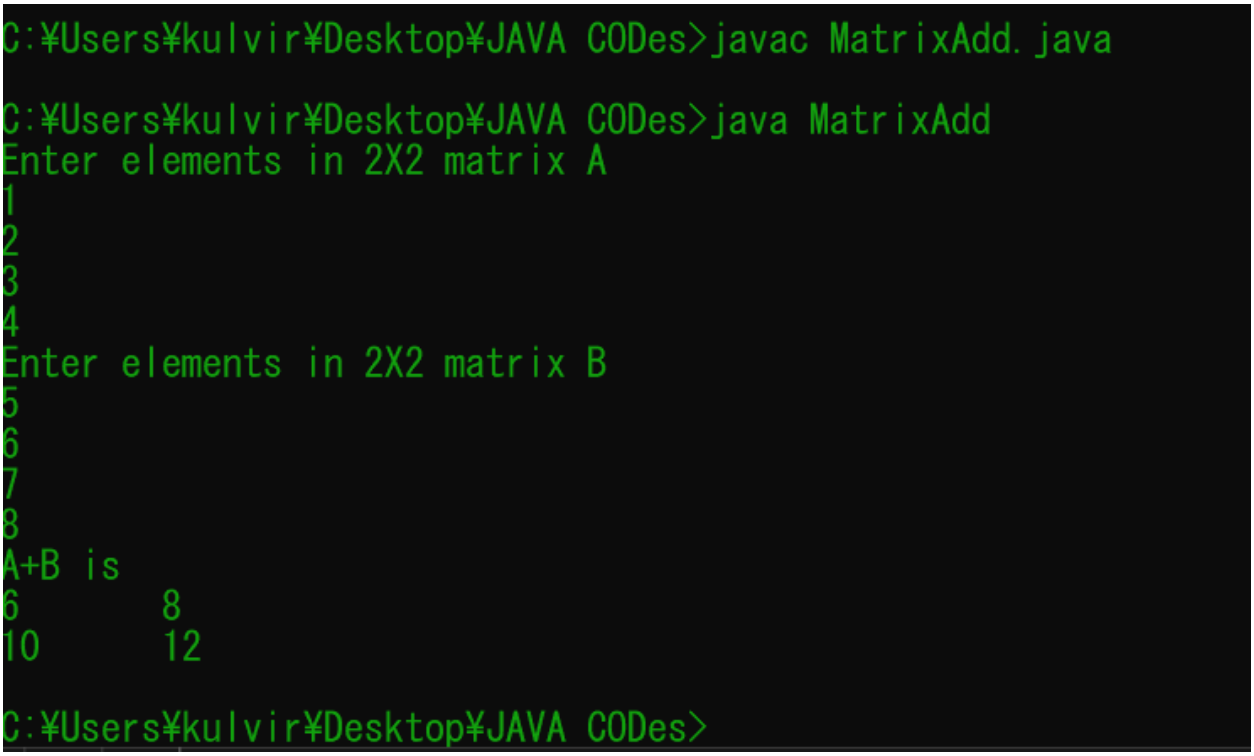
8. Run a nested loop inside the above loop from j=0 to j<2
9. Perform the following operation: mat3[i][j]=mat1[i][j]+mat2[i][j]
10. After the completion of the nested loop display mat3
11. Stop

Code:

```
import java.util.*;

class MatrixAdd {

   public static void main(String[] args) {

      Scanner x = new Scanner(System.in);

      int mat1[][] = new int[2][2];

      int mat2[][] = new int[2][2];

      int mat3[][] = new int[2][2];


      System.out.println("Enter elements in 2X2 matrix A");

      int i,j;

      for(i=0;i<2;i++){

         for(j=0;j<2;j++){

            mat1[i][j] = x.nextInt();

         }

      }

      System.out.println("Enter elements in 2X2 matrix B");

      for(i=0;i<2;i++){

         for(j=0;j<2;j++){

            mat2[i][j] = x.nextInt();

         }

      }

      System.out.println("A+B is ");


      for(i=0;i<2;i++){

         for(j=0;j<2;j++){
```

```
            mat3[i][j] = mat1[i][j] + mat2[i][j];
            System.out.print(mat3[i][j]+"\t");
        }
        System.out.println();
    }
  }
}
```

Output:



Result:

The code successfully computes the sum of the two input matrices

Question 4

Problem:

Write a Java program to perform matrix multiplication of 2 matrices.

Aim:

To calculate the matrix which is the product of two matrices of 2X2 order by applying the mathematical rule of matrix multiplication

Algorithm:

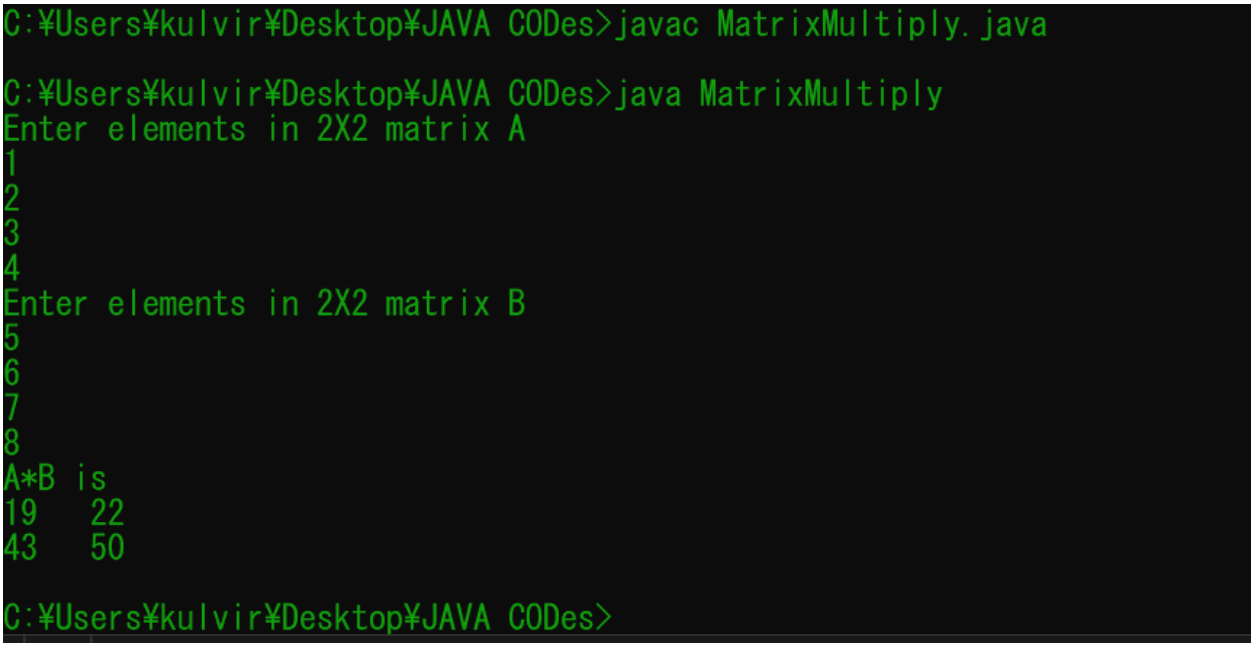
1. Start
2. Initialize mat1[][] a double dimension arrays of integer data type of size 2 by 2
3. Initialize mat2[][] a double dimension arrays of integer data type of size 2 by 2
4. Initialize mat3[][] a double dimension arrays of integer data type of size 2 by 2
5. Take input from the user into the double dimension array mat1[][]
6. Take input from the user into the double dimension array mat2[][]
7. Run a loop from i=0 to i<2
8. Run a nested loop inside the above loop from j=0 to j<2
9. Assign mat3[i][j]=0
10. Run a nested loop inside the 8th step loop from k=0 to k>2
11. Perform the following operation: mat3[i][j] = mat3[i][j]+(mat1[i][k]*mat2[k][j])
12. After the completion of the nested loop display mat3
13. Stop

Code:

```
import java.util.*;

class MatrixMultiply {

   public static void main(String[] args) {

      Scanner x = new Scanner(System.in);

      int mat1[][] = new int[2][2];

      int mat2[][] = new int[2][2];

      int mat3[][] = new int[2][2];


      System.out.println("Enter elements in 2X2 matrix A");

      int i,j,k;

      for(i=0;i<2;i++){

         for(j=0;j<2;j++){
```

```
            mat1[i][j] = x.nextInt();
          }
        }
        System.out.println("Enter elements in 2X2 matrix B");
        for(i=0;i<2;i++){
          for(j=0;j<2;j++){
            mat2[i][j] = x.nextInt();
          }
        }
        System.out.println("A*B is ");

        for(i=0;i<2;i++){
          for(j=0;j<2;j++){
            mat3[i][j]=0;
            for(k=0;k<2;k++){
              mat3[i][j] = mat3[i][j]+(mat1[i][k]*mat2[k][j]);
            }
          }
        }
        for(i=0;i<2;i++){
          for(j=0;j<2;j++){
            System.out.print(mat3[i][j]+"   ");
          }
          System.out.println();
        }
      }
    }
```

Output:



Result:

The code successfully computes the product of the 2 input matrices.