**Alexandria Higher Institute for Engineering and Technology**
**Computer Department – First Grade**
Project: **Matrices Manipulation**
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**Two-Dimensional Arrays**

1. READ TWO MATRICES.
2. EDIT THE MENU TO CHOOSE ONE OF THE FOLLOWING OPERATIONS:-
   A. GET THE SUM / DIFFERENCES OF TWO MATRICES.
   B. GET THE MULTIPLICATION OF TWO MATRICES.
   C. GET THE TRANSPOSE OF A MATRIX
3. PRINT THE RESULT

# MATRICES MANIPULATION

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# MATRICES MANIPULATION PROJECT

MOSTAFA ABD EL-ALEEM

*Getting number of rows and columns of the two square matrices from user*

```
Scanner getInput = new Scanner(System.in);
      System.out.print("Enter number of rows and columns: ");
      int rowAndColumn = getInput.nextInt();

     int[][] m1 = new int[rowAndColumn][rowAndColumn];
     int[][] m2 = new int[rowAndColumn][rowAndColumn];
```

*Getting values of the first matrix from user*

```
System.out.println("Enter values of Matrix 1 =>");
      for (int i = 0; i < m1.length; i++) {
            System.out.println("** Row " + (i+1) + ":");
            System.out.println("----------------------");
            for (int j = 0; j < m1[i].length; j++) {
            System.out.print("Element of Column " + (j+1) + ": ");
            m1[i][j] = getInput.nextInt();
            }
      }
```

*Getting values of the second matrix from user*

```
System.out.println("Enter values of Matrix 2 =>");
      for (int i = 0; i < m2.length; i++) {
            System.out.println("** Row " + (i+1) + ":");
            System.out.println("----------------------");
            for (int j = 0; j < m2[i].length; j++) {
            System.out.print("Element of Column " + (j+1) + ": ");
            m2[i][j] = getInput.nextInt();
            }
      }
```

*Closing Scanner class*

```
      getInput.close();
```

*Printing out the first matrix*

```
for (int i = 0; i < m1.length; i++) {
      for (int j = 0; j < m1[i].length; j++) {
            System.out.print(m1[i][j] + " ");
      }
      System.out.println();
}
```

*Printing out the second matrix*

```
for (int i = 0; i < m2.length; i++) {
      for (int j = 0; j < m2[i].length; j++) {
            System.out.print(m2[i][j] + " ");
      }
      System.out.println();
}
```

*Printing out the sum of the two matrices*

```
for (int i = 0; i < m1.length; i++) {
      for (int j = 0; j < m1[i].length; j++) {
            System.out.print(m1[i][j] + m2[i][j] + " ");
      }
      System.out.println();
}
```

*Printing out the difference of the two matrices*

```
for (int i = 0; i < m1.length; i++) {
      for (int j = 0; j < m1[i].length; j++) {
            System.out.print(m1[i][j] - m2[i][j] + " ");
      }
      System.out.println();
}
```

*Printing out the multiplication of the two matrices*

```
for (int i = 0; i < m1.length; i++) {
      for (int j = 0; j < m1[i].length; j++) {
            System.out.print(m1[i][j] * m2[j][i] + " ");
      }
      System.out.println();
}
```

*Printing out the transpose of the first matrix*

```
for (int i = 0; i < m1[i].length; i++) {
      for (int j = 0; j < m1.length; j++) {
            System.out.print(m1[j][i] + " ");
      }
      System.out.println();
}
```

*Printing out the transpose of the second matrix*

```
for (int i = 0; i < m2[i].length; i++) {
      for (int j = 0; j < m2.length; j++) {
            System.out.print(m2[j][i] + " ");
      }
      System.out.println();
}
```