

קורס: מבוא למדעי המחשב בשפת Java

סטודנטית 1: דליה ויליאם

סטודנט 2: גיא רחמים

#### Assignment 8:

```
//Dalya William & Guy Rahamim
//Assignment 8
import java.util.Scanner;
public class Assignment8
{
    //initializing a global scanner.
    public static Scanner input = new Scanner (System.in);
    public static void main(String[] args)
    {
        //-----Question 2-----
        //initializing variables
        int size=4;
        int[] array1;
        int[] array2;

        //initializing array1 and array2 using initializeArray
function.

        System.out.println("Please enter values for array number 1:");
        array1= initializeArray(size);
        System.out.println("Please enter values for array number 2:");
        array2= initializeArray(size);

        //print both arrays using printArray function.
        System.out.println("The arrays in question are: \n");
        printArray(array1);
        System.out.println();
        printArray(array2);

        //decides if the arrays form a mirror pair using mirrorPair.
        System.out.println("\nDo these two arrays form a mirror pair?
the answer is "

        +mirrorPair(array1,array2));

        //-----Question 3-----
        System.out.println("\n\n");
        //initializing variables.
        boolean rowColChecker=false;
        int rows,cols;
        int fullArraysizes=6;
        char max;
        char [][] charArray = new char [fullArraysizes][fullArraysizes],
tempArray;

        System.out.println("Please enter how many rows and coloumns "
+ "would you like to use from
the available 6 : ");

        do
        {
            rows=input.nextInt();
```

```

        cols=input.nextInt();
        if (rows >=1 && cols >=1 && rows <=6 && cols <=6)
            rowColChecker=true;
        else
            System.out.println("Bad input! please make
sure both numbers are in the range of 1 - 6");
    }
    while (!rowColChecker);

    //initializing charArray with user input.
    charArray=initialize2DCharArray(charArray,rows,cols);

    //cropping the 6X6 array and storing the biggest char
    //value in the array.
    tempArray=cropCharArray(charArray,rows,cols);
    max = maxCharInArray(tempArray);

    //print the entire 6X6 array and the biggest char value.
    print2DCharArray(charArray);
    System.out.println("\n the biggest character in the array is: "
+max);

    //-----Question 4-----
    -----//

    //initialize variables
    int rowSize=5,colSize=4;
    int[][] array;

    //initialize array with function.
    array=initialize2DArray(rowSize,colSize);

    //print the array using a function.
    //and then determine if it is positive using the positiveArray
function.

    print2DArray(array);
    System.out.println("is the array positive? the answer is " +
positiveArray(array));

    input.close();
}

//-----!!! FUNCTIONS FOR INTEGER ARRAYS !!! -----//

//a function that prints an array.
public static void printArray (int[] array)
{
    for (int i=0; i<array.length;i++)
    {
        System.out.print(array[i]+ "\t");
    }
}

//a function that prints a 2D array.
public static void print2DArray (int[][] array)
{
    for (int i=0; i<array.length;i++)
    {
        printArray(array[i]);
        System.out.println();
    }
}

```

```

    }

    //a function that initializes an array.
    public static int[] initializeArray (int arraySize)
    {
        int [] array = new int [arraySize];
        for (int i=0; i<array.length;i++)
        {
            System.out.println("Please enter a number to store in
array cell number " +i);
            array[i]=input.nextInt();
        }
        return array;
    }

    //a function that initializes a 2D array
    public static int[][] initialize2DArray (int rowNum, int colNum)
    {
        int[][] array = new int [rowNum][colNum];
        for (int i=0; i<array.length;i++)
        {
            array[i]=initializeArray(colNum);
        }
        return array;
    }

    //-----!!! FUNCTIONS FOR QUESTIONS 2,3 !!! -----//

    //a functions that determines if 2 arrays are mirroring each other.
    public static boolean mirrorPair(int[] array1, int[] array2)
    {
        for (int i = 0; i<array1.length;i++)
        {
            if (array1[i]!=array2[array2.length-i-1])
                return false;
        }
        return true;
    }

    //a function that finds the biggest char among the
    //outer frame of a given 2D array.
    public static char maxCharInArray(char [][]array)
    {
        char max= array[0][0];
        for (int i=0; i<array.length;i++)
        {
            for (int j=0; j<array[i].length;j++)
            {
                if (i==0 || i== array[i].length-1 || j==0
|| j==array[i].length-1)
                {
                    System.out.println(array[i][j]);
                    System.out.println("location:
"+ i + " , " +j + " comparing " + max +" with " +array[i][j]);
                    max = max>array[i][j] ? max :
array[i][j];
                }
            }
        }
        return max;
    }

```

```

    }

    //a function that crops a small 2D array out of a larger
    //2D character array.
    public static char[][] cropCharArray(char[][] arrayToCrop, int rowNum, int
colNum)
    {
        char[][] array= new char[rowNum+1][colNum+1];
        for (int i = 0; i < array.length; i++)
        {
            for (int j = 0; j < array.length; j++)
            {
                array[i][j]=arrayToCrop[i][j];
            }
        }
        return array;
    }
    //a function that prints an array of characters.
    public static void printCharArray (char[] array)
    {
        for (int i=0; i<array.length;i++)
        {
            System.out.print(array[i]+ "\t");
        }
    }
    //a function that prints a 2D array of characters.
    public static void print2DCharArray (char[][] array)
    {
        for (int i=0; i<array.length;i++)
        {
            printCharArray(array[i]);
            System.out.println("");
        }
    }

    //a function that initializes a 2D array of characters.
    public static char[][] initialize2DCharArray(char[][] charArray, int rows, int
cols)
    {
        char exclamation='!';
        for (int i=0;i<charArray.length;i++)
        {
            for (int j=0; j<charArray.length;j++)
            {
                if (i<rows && j<cols)
                {
                    System.out.println("Please
enter a char to be stored at row: "+i + "coloumn: " +j);
                    charArray[i][j]=input.next().charAt(0);
                }
                else
                    charArray[i][j]=exclamation;
            }
            System.out.println();
        }
        return charArray;
    }

    //a function that checks if an array is considered "positive"

```

```

public static boolean positiveArray(int[][] array)
{
    int rowSum=0, colSum=0;

    for (int row = 0; row < array.length; row++)
    {
        for (int col = 0; col < array[row].length; col++)
        {
            if (col%2!=0)
            {
                colSum+=array[row][col];
            }
            if ((row%2)==0)
            {
                rowSum+=array[row][col];
            }
        }
        if (colSum>rowSum)
            return true;
        else
            return false;
    }
}

```

Output for question 2:

```
Assignment8 [Java Application] C:\Program Files\Java\jdk-13.0.1\bin\j
Please enter values for array number 1:
Please enter a number to store in array cell number 0
1
Please enter a number to store in array cell number 1
2
Please enter a number to store in array cell number 2
3
Please enter a number to store in array cell number 3
4
Please enter values for array number 2:
Please enter a number to store in array cell number 0
4
Please enter a number to store in array cell number 1
3
Please enter a number to store in array cell number 2
2
Please enter a number to store in array cell number 3
1
The arrays in question are:
1      2      3      4
4      3      2      1
Do these two arrays form a mirror pair? the answer is true
```

Output for question 3:

```
Please enter how many rows and columns would you like to use from the available 6 :
3
3
Please enter a char to be stored at row: 0, column: 0
@
Please enter a char to be stored at row: 0, column: 1
$
Please enter a char to be stored at row: 0, column: 2
^

Please enter a char to be stored at row: 1, column: 0
a
Please enter a char to be stored at row: 1, column: 1
z
Please enter a char to be stored at row: 1, column: 2
p

Please enter a char to be stored at row: 2, column: 0
3
Please enter a char to be stored at row: 2, column: 1
5
Please enter a char to be stored at row: 2, column: 2
8
[

@      $      ^      !      !      !
a      z      p      !      !      !
3      5      8      !      !      !
!      !      !      !      !      !
!      !      !      !      !      !
!      !      !      !      !      !

the biggest character in the array is: a
```

Output for question 4:

```
Please enter a number to store in array cell number 0
-6
Please enter a number to store in array cell number 1
12
Please enter a number to store in array cell number 2
4
Please enter a number to store in array cell number 3
5
Please enter a number to store in array cell number 0
2
Please enter a number to store in array cell number 1
4
Please enter a number to store in array cell number 2
14
Please enter a number to store in array cell number 3
0
Please enter a number to store in array cell number 0
1
Please enter a number to store in array cell number 1
3
Please enter a number to store in array cell number 2
10
Please enter a number to store in array cell number 3
-3
Please enter a number to store in array cell number 0
0
Please enter a number to store in array cell number 1
4
Please enter a number to store in array cell number 2
-6
Please enter a number to store in array cell number 3
6
Please enter a number to store in array cell number 0
-1
Please enter a number to store in array cell number 1
-12
Please enter a number to store in array cell number 2
4
Please enter a number to store in array cell number 3
1
-6      12      4      5
2       4      14     0
1       3      10    -3
0       4      -6     6
-1     -12     4      1
is the array positive? the answer is true
```