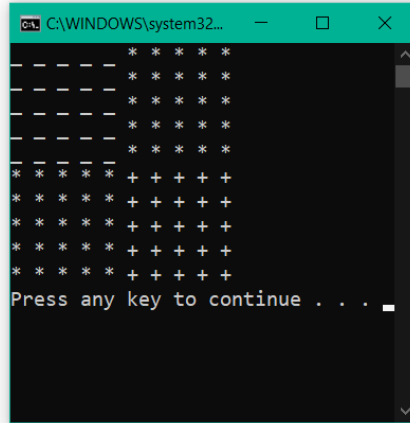```
class Array12A {
    public static void main(String[] args) {
        int MAX_ROWS = 10;
        int MAX_COLS = 10;
        int rowsUsed = 5;
        int colsUsed = 5;
        int row,column;
        char [][] table = new char[MAX_ROWS][MAX_COLS];
        for (column = 0 ; column < MAX_COLS ; column++) {
            for (row = 0 ; row < MAX_ROWS ; row++)
                table[row][column]= '*';
        }
        for (row = rowsUsed ; row < MAX_ROWS ; row++)
            for (column = colsUsed ; column < MAX_COLS ; column++)
                table[row][column]= '+';

        for (column = 0 ; column < colsUsed ; column++)
            for (row = 0 ; row < rowsUsed ; row++)
                table[row][column]= '_';

        printMatrix(table);
    }
    public static void printMatrix(char[][] A){
        for(int i = 0; i < A.length ; i++){
            for(int j = 0;j < A[0].length ; j++){
                System.out.print(A[i][j]+" ");
            }
            System.out.println();
        }
    }
}//Supawit Saengrattanayon 64050694
```

```
C:\WINDOWS\system32...
_ _ _ _ _ * * * * *
_ _ _ _ _ * * * * *
_ _ _ _ _ * * * * *
_ _ _ _ _ * * * * *
_ _ _ _ _ * * * * *
* * * * * + + + + +
* * * * * + + + + +
* * * * * + + + + +
* * * * * + + + + +
* * * * * + + + + +
Press any key to continue . . .
```

```
---------- Java Compile ----------
Picked up JAVA_TOOL_OPTIONS: -Dfile.encoding=UTF-8


Output completed (0 sec consumed) - Normal Termination
```

12A

Supawit Saengrattanayon
64050694

```java
class Array12A {
    public static void main(String[] args) {
        int MAX_ROWS = 10;
        int MAX_COLS = 10;
        int rowUsed = 5;
        int colsUsed = 5;
        int row, column;
        char [][] table = new char[MAX_ROWS][MAX_COLS];
        for (column = 0; column < MAX_COLS ; column++) {
            for (row = 0; row < MAX_ROWS ; row++)
                table[row][column] = '*';
        }
        for (row = rowsUsed ; row < MAX_ROWS ; row++)
            for (column = colsUsed ; column < MAX_COLS ; column++)
                table[row][column] = '+';

        for (column = 0; column < colsUsed ; column++) {
            for (row = 0; row < rowsUsed; row++)
                table[row][column] = '_';

        printMatrix(table);
    }
    public static void printMatrix (char[][] A) {
        for(int i = 0; i < A.length ; i++) {
            for(int j = 0; j < A[0].length ; j++) {
                System.out.print(A[i][j]+" ");
            }
            System.out.println();
        }
    }
}
```

Output :

```
_ _ _ _ _ * * * * *
_ _ _ _ _ * * * * *
_ _ _ _ _ * * * * *
_ _ _ _ _ * * * * *
_ _ _ _ _ * * * * *
* * * * * + + + + +
* * * * * + + + + +
* * * * * + + + + +
* * * * * + + + + +
* * * * * + + + + +
```
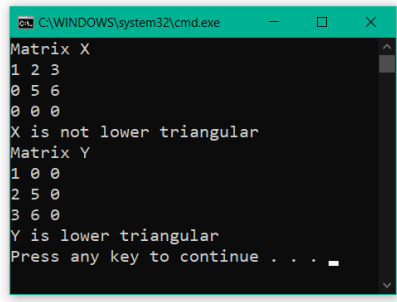
1) ส่วนของโปรแกรมเป็นการสร้างตาราง (อาเรย์) ขนาด <u>10^x10</u> มิติ ประเภท <u>char</u>
2) ลูป for กลุ่มแรก เป็นการประมวลผลตาราง   ตามแถว หรือ <u>ตามคอลัมน์</u>
   ลูป for กลุ่มสอง เป็นการประมวลผลตาราง   <u>ตามแถว</u> หรือ ตามคอลัมน์
   ลูป for กลุ่มสาม เป็นการประมวลผลตาราง   ตามแถว หรือ <u>ตามคอลัมน์</u>

12B

```java
class Array12B{
    public static boolean lowerTriangular(int[][] M){
        int i, j;
        for (i = 0; i < M.length; i++){
            for (j = i + 1; j < M[i].length; j++){
                if(M[i][j] != 0)
                    return false;
                    break;
            }
        }
        return true;
    }
    public static int[][] transposeMatrix(int[][] M){
        int[][] X = new int[M[0].length][M.length];
        int i, j;
        for (i = 0; i < M.length; i++){
            for (j = 0; j < M[i].length; j++){
                X[i][j] = M[j][i];
            }
        }
        return X;
    }
    public static void printMatrix(int[][] M){
        int i, j;
        for (i = 0; i < M.length; i++){
            for (j = 0; j < M[i].length; j++){
                System.out.print(M[i][j]+" ");
            }
            System.out.println();
        }
    }
    public static void main(String[] args) {
        int[][] X = {{1, 2, 3}, {0, 5, 6}, {0, 0, 0}};
        int[][] Y;
        System.out.println("Matrix X");
        printMatrix(X);
        if (lowerTriangular(X))
            System.out.println("X is lower triangular");
        else
            System.out.println("X is not lower triangular");
        Y = transposeMatrix(X);
        System.out.println("Matrix Y");
        printMatrix(Y);
        if (lowerTriangular(Y))
            System.out.println("Y is lower triangular");
        else
            System.out.println("Y is not lower triangular");
    }
}//Supawit Saengrattanayon 64050694
```

```
Matrix X
1 2 3
0 5 6
0 0 0
X is not lower triangular
Matrix Y
1 0 0
2 5 0
3 6 0
Y is lower triangular
Press any key to continue . . .
```

```
---------- Java Compile ----------
Picked up JAVA_TOOL_OPTIONS: -Dfile.encoding=UTF-8

Output completed (0 sec consumed) - Normal Termination
```

12B

Sapawit   Saengrattanayon
64050694

```java
class Array12B {
    public static boolean lowerTriangular (int[][] M){
        int i,j;
        for(i=0; i < M.length ; i++){
            for(j=i+1 ; j < M[i].length ; j++){
                if(M[i][j] !=0)
                    return false ;
                    break;
            }
        }
        return true;
    }
    public static int[][] transposeMatrix(int[][] M){
        int[][] X = new int[M[0].length][M.length];
        int i,j;
        for(i=0; i < M.length ; i++){
            for(j=0 ; j < M[i].length ; j++){
                X[i][j] = M[j][i];
            }
        }
        return X;
    }
    public static void printMatrix (int[][] M){
        int i,j;
        for (i=0 ; i < M.length ; i++){
            for (j=0 ; j < M[i].length ; j++){
                System.out.print(M[i][j] +" ");
            }
            System.out.println();
        }
    }
    public static void main(String[] args){
        int[][] X = {{1,2,3},{0,5,6},{0,0,0}};
        int[][] Y ;
        System.out.println("Matrix X");
        printMatrix(X);
        if(lowerTriangular(X))
            System.out.println("X is lower triangular");
        else
            System.out.println("X is not lower triangular");
        Y = transposeMatrix(X);
        System.out.println("Transpose Matrix Y");
        printMatrix(Y);
        if(lowerTriangular(Y))
            System.out.println("Y is lower triangular");
        else
            System.out.println("Y is not lower triangular");
    }
}
```

Output :

```
Matrix X
1   2   3
0   5   6
0   0   0
X is not lower triangular
Matrix Y
1   0   0
2   5   0
3   6   0
Y is lower triangular
```