Week 09 : Programming Assignment 3

Due on 2025-03-27, 23:59 IST

Complete the code to **perform a 45 degree anti clock wise rotation with respect to the center of a 5 × 5 2D Array as shown below:**

INPUT:

```
00100
00100
11111
00100
00100
```

OUTPUT:

```
10001
01010
00100
01010
10001
```

Note the following points carefully:
1. Here, instead of 0 and 1 any character may be given.
2. The input and output array size must be of dimension 5 × 5 and nothing else.

Private Test cases used for evaluation	Input	Expected Output	Actual Output	Status
Test Case 1	00100 00100 00100 00100 00100	10000\n 01000\n 00100\n 00010\n 00001	10000\n 01000\n 00100\n 00010\n 00001\n	Passed

The due date for submitting this assignment has passed.
1 out of 1 tests passed.
You scored 100.0/100.

Assignment submitted on 2025-03-25, 21:14 IST

Your last recorded submission was :

```java
import java.util.Scanner;
public class Question93{
    public static void main(String args[]){
        Scanner sc = new Scanner(System.in);
char arr[][]= new char[5][5];
            // Input 2D Array using Scanner Class
            for(int line=0;line<5; line++){
                String input = sc.nextLine();
                char seq[] = input.toCharArray();
                if(seq.length==5){
                    for(int i=0;i<5;i++){
                        arr[line][i]=seq[i];
                    }
                }else{
                    System.out.print("Wrong Input!");
                    System.exit(0);
                }
            }
            // Declaring the array to store Transition
            char tra[][] = new char[5][5];
            String outer[]={"00","10","20","30",
                            "40","41","42","43",
                            "44","34","24","14",
                            "04","03","02","01"};
            String inner[]={"11","21","31","32",
                            "33","23","13","12"};
            // 45-Degree rotation
            for(int i=0;i<5;i++){
                for(int j=0;j<5;j++){
                    // Transform outer portion
                    for(int k=0; k<outer.length; k++){
                        char indices[]=outer[k].toCharArray();
                        int a = Integer.parseInt(String.valueOf(indices[0]));
                        int b = Integer.parseInt(String.valueOf(indices[1]));
                        if(a==i && b==j){
                            if(k==15){k=1;}
                            else if(k==14){k=0;}
                            else {k+=2;}
                            indices=outer[k].toCharArray();
                            a = Integer.parseInt(String.valueOf(indices[0]));
                            b = Integer.parseInt(String.valueOf(indices[1]));
                            tra[a][b] = arr[i][j];
                            break;
                        }
                    }
                    // Transform inner portion
                    for(int k=0; k<inner.length; k++){
                        char indices[]=inner[k].toCharArray();
                        int a = Integer.parseInt(String.valueOf(indices[0]));
                        int b = Integer.parseInt(String.valueOf(indices[1]));
                        if(a==i && b==j){
                            if(k==7){k=0;}
                            else {k+=1;}
                            indices=inner[k].toCharArray();
                            a = Integer.parseInt(String.valueOf(indices[0]));
                            b = Integer.parseInt(String.valueOf(indices[1]));
                            tra[a][b] = arr[i][j];
                            break;
                        }
                    }
                    // Keeping center same
                    tra[2][2] = arr[2][2];
                }
            }
            // Print the transformed output
            for(int i=0;i<5;i++){
                for(int j=0;j<5;j++){
                    System.out.print(tra[i][j]);
                }
                System.out.println();
            }
} // The main() method ends here
} // The main class ends here
```

Sample solutions (Provided by instructor)

```java
import java.util.Scanner;
public class Question93{
    public static void main(String args[]){
        Scanner sc = new Scanner(System.in);
char arr[][]= new char[5][5];
            // Input 2D Array using Scanner Class
            for(int line=0;line<5; line++){
                String input = sc.nextLine();
                char seq[] = input.toCharArray();
                if(seq.length==5){
                    for(int i=0;i<5;i++){
                        arr[line][i]=seq[i];
                    }
                }else{
                    System.out.print("Wrong Input!");
                    System.exit(0);
                }
            }
            // Declaring the array to store Transition
            char tra[][] = new char[5][5];
            String outer[]={"00","10","20","30",
                            "40","41","42","43",
                            "44","34","24","14",
                            "04","03","02","01"};

            String inner[]={"11","21","31","32",
                            "33","23","13","12"};

            // 45-Degree rotation
            for(int i=0;i<5;i++){
                for(int j=0;j<5;j++){
                    // Transform outer portion
                    for(int k=0; k<outer.length; k++){
                        char indices[]=outer[k].toCharArray();
                        int a = Integer.parseInt(String.valueOf(indices[0]));
                        int b = Integer.parseInt(String.valueOf(indices[1]));
                        if(a==i && b==j){
                            if(k==15){k=1;}
                            else if(k==14){k=0;}
                            else {k+=2;}
                            indices=outer[k].toCharArray();
                            a = Integer.parseInt(String.valueOf(indices[0]));
                            b = Integer.parseInt(String.valueOf(indices[1]));
                            tra[a][b] = arr[i][j];
                            break;
                        }
                    }
                    // Transform inner portion
                    for(int k=0; k<inner.length; k++){
                        char indices[]=inner[k].toCharArray();
                        int a = Integer.parseInt(String.valueOf(indices[0]));
                        int b = Integer.parseInt(String.valueOf(indices[1]));
                        if(a==i && b==j){
                            if(k==7){k=0;}
                            else {k+=1;}
                            indices=inner[k].toCharArray();
                            a = Integer.parseInt(String.valueOf(indices[0]));
                            b = Integer.parseInt(String.valueOf(indices[1]));
                            tra[a][b] = arr[i][j];
                            break;
                        }
                    }
                    // Keeping center same
                    tra[2][2] = arr[2][2];
                }
            }
            // Print the transformed output
            for(int i=0;i<5;i++){
                for(int j=0;j<5;j++){
                    System.out.print(tra[i][j]);
                }
                System.out.println();
            }
} // The main() method ends here
} // The main class ends here
```