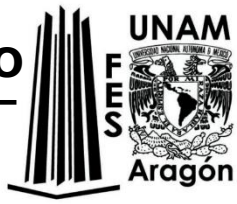
UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO



FACULTAD DE ESTUDIOS SUPERIORES ARAGON

TAREA 6

P R E S E N T A

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URL del repositorio:

https://github.com/TyrBalder1439/Estructura-de-Datos-

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GameOfLife.java × src\Main.java src\Array2d.java

```java
public class GameOfLife {  2 usages
    private Array2d grid;  16 usages
    private int rows;  5 usages
    private int cols;  5 usages

    public GameOfLife(int rows, int cols) {  1 usage
        this.rows = rows;
        this.cols = cols;
        grid = new Array2d(rows, cols);
        initializeGrid();
    }
    private void initializeGrid() {  1 usage
        grid.set(1, 1, 1);
        grid.set(1, 2, 1);
        grid.set(1, 3, 1);
        grid.set(2, 2, 1);
        grid.set(3, 3, 1);
        grid.set(3, 1, 1);
        grid.set(4, 4, 1);
        grid.set(5, 5, 1);
        grid.set(5, 4, 1);
        grid.set(5, 3, 1);
        grid.set(6, 3, 1);
    }
    public void nextGeneration() {  1 usage
        Array2d newGrid = new Array2d(rows, cols);

```

```java

        for (int row = 0; row < rows; row++) {
            for (int col = 0; col < cols; col++) {
                int liveNeighbors = countLiveNeighbors(row, col);
                if (grid.get(row, col) == 1) {
                    if (liveNeighbors == 2 || liveNeighbors == 3) {
                        newGrid.set(row, col, 1);
                    } else {
                        newGrid.set(row, col, 0);
                    }
                } else {  // Célula muerta
                    if (liveNeighbors == 3) {
                        newGrid.set(row, col, 1);
                    } else {
                        newGrid.set(row, col, 0);
                    }
                }
            }
        }
        grid = newGrid;
    }
    private int countLiveNeighbors(int row, int col) {  1 usage
        int liveNeighbors = 0;

        for (int i = -1; i <= 1; i++) {
            for (int j = -1; j <= 1; j++) {
                if (i == 0 && j == 0) continue;

                int newRow = row + i;
                int newCol = col + j;

                if (newRow >= 0 && newRow < rows && newCol >= 0 && newCol < cols) {
                    liveNeighbors += grid.get(newRow, newCol);
                }
            }
        }
        return liveNeighbors;
    }
    public void printGrid() {  1 usage
        for (int row = 0; row < rows; row++) {
            for (int col = 0; col < cols; col++) {
                System.out.print(grid.get(row, col) + " ");
            }
            System.out.println();
        }
    }
}
```

GameOfLife.java | src\Main.java | Array2d.java

```java
public class Array2d {  4 usages
    private int[][] grid;  5 usages

    public Array2d(int rows, int cols) {  2 usages
        grid = new int[rows][cols];
    }

    public int get(int row, int col) {  3 usages
        return grid[row][col];
    }

    public void set(int row, int col, int value) {  15 usages
        grid[row][col] = value;
    }

    public int getRows() {  no usages
        return grid.length;
    }

    public int getCols() {  no usages
        return grid[0].length;
    }
}
```

GameOfLife.java | Main.java | Array2d.java

```java
public class Main {
    public static void main(String[] args) {
        GameOfLife game = new GameOfLife(8, 8);
        int generations = 10;
        for (int i = 0; i < generations; i++) {
            System.out.println("Generación " + (i + 1) + ":");
            game.printGrid();
            game.nextGeneration();
        }
    }
}
```

```
Generación 1:
0 0 0 0 0 0 0 0
0 1 1 1 0 0 0 0
0 0 1 0 0 0 0 0
0 1 0 1 0 0 0 0
0 0 0 0 1 0 0 0
0 0 0 1 1 1 0 0
0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0
Generación 2:
0 0 1 0 0 0 0 0
0 1 1 1 0 0 0 0
0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 0
0 0 1 0 0 1 0 0
0 0 0 1 0 1 0 0
0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0
```

```
Generación 3:
0 1 1 1 0 0 0 0
0 1 1 1 0 0 0 0
0 1 0 0 0 0 0 0
0 0 1 1 0 0 0 0
0 0 1 0 0 0 0 0
0 0 1 1 0 0 0 0
0 0 0 0 1 0 0 0
0 0 0 0 0 0 0 0
Generación 4:
0 1 0 1 0 0 0 0
1 0 0 1 0 0 0 0
0 1 0 0 0 0 0 0
0 1 1 1 0 0 0 0
0 1 0 0 0 0 0 0
0 0 1 1 0 0 0 0
0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0
```

```
Generación 5:
0 0 1 0 0 0 0 0
1 1 0 0 0 0 0 0
1 1 0 1 0 0 0 0
1 1 0 0 0 0 0 0
0 1 0 0 0 0 0 0
0 0 1 1 0 0 0 0
0 0 1 1 0 0 0 0
0 0 0 0 0 0 0 0
Generación 6:
0 1 0 0 0 0 0 0
1 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
1 1 0 0 0 0 0 0
0 1 0 1 0 0 0 0
0 0 1 1 0 0 0 0
0 0 0 0 0 0 0 0
```

```
Generación 7:
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
1 1 1 0 0 0 0 0
1 1 0 1 0 0 0 0
0 0 1 1 0 0 0 0
0 0 0 0 0 0 0 0
Generación 8:
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 1 0 0 0 0 0 0
1 0 1 0 0 0 0 0
1 0 0 1 0 0 0 0
0 1 1 1 0 0 0 0
0 0 0 0 0 0 0 0
```

```
Generación 9:
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 1 0 0 0 0 0 0
1 0 1 0 0 0 0 0
1 0 0 1 0 0 0 0
0 1 1 1 0 0 0 0
0 0 1 0 0 0 0 0
Generación 10:
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 1 0 0 0 0 0 0
1 0 1 0 0 0 0 0
1 0 0 1 0 0 0 0
0 1 0 1 0 0 0 0
0 1 1 1 0 0 0 0
```