CSE 331 – Computer Organization

Homework #1 – Bomberman with MIPS Assembly

Version #2

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Getting Input from the User:

I assigned a variable called `grid` in the `.data` region, which can hold a maximum of 50x50 array. At the beginning of the program, the user is asked for row, column, and grid information. While the row and column are kept as integers in the registers, the grid is added as a string to the space reserved for it in the `.data` region.

For the application to work correctly, the `_` character, which I use as a delimiter, must be added to the end of each row.

Example Inputs and Results:

```
------------------- Test - 1 -------------------


Welcome to the BOMBERMAN!


Please enter the number of rows: 16

Please enter the number of columns: 16

Please enter the grid:

O.............O_...O.........O._.....O..O......_.........
....O.._.........O.....______________..._O............_.
.......O.......__..O....O.......__..........OO..._.........
..OO.._.................__..O.............__..O....O...O...._..
...O..O.......__..........O.O.._


Initial state:

O.............O

...O.........O.

.....O..O.......

............O..
```

```
..........O.....
................
...O............
........O.......
..O....O........
...........OO...
............OO..
................
..O.............
..O....O...O....
.....O..O.......
...........O.O..

Final state:
..O.OOOOOOOOOO..
.O....OO.OOOO...
OOO.......OOO..O
OOOOO.OO.O.O...O
OOOOOOOOO...O.OO
OOO.OOOOOO.OOOOO
OO...OOO.OOOOOOO
OO..OOO...OOOOOO
O...OO...OO..OOO
OO.OOOO.OO....OO
OOOOOOOOOOO....O
```

```
OO.OOOOOOOOO..OO
O...OOO.OOO.OOOO
O...O....O...OOO
OO.O......O.O.OO
OOOOO.OO.O.....O

Goodbye!
------------------- Test - 2 -------------------

Welcome to the BOMBERMAN!

Please enter the number of rows: 7
Please enter the number of columns: 13
Please enter the grid:
O.........O._..O..O......._.........O.._.......O....._....
.........._O............._.....O......._

Initial state:
O.........O.
..O..O.......
..........O..
.......O.....
.............
O............
.....O.......
```

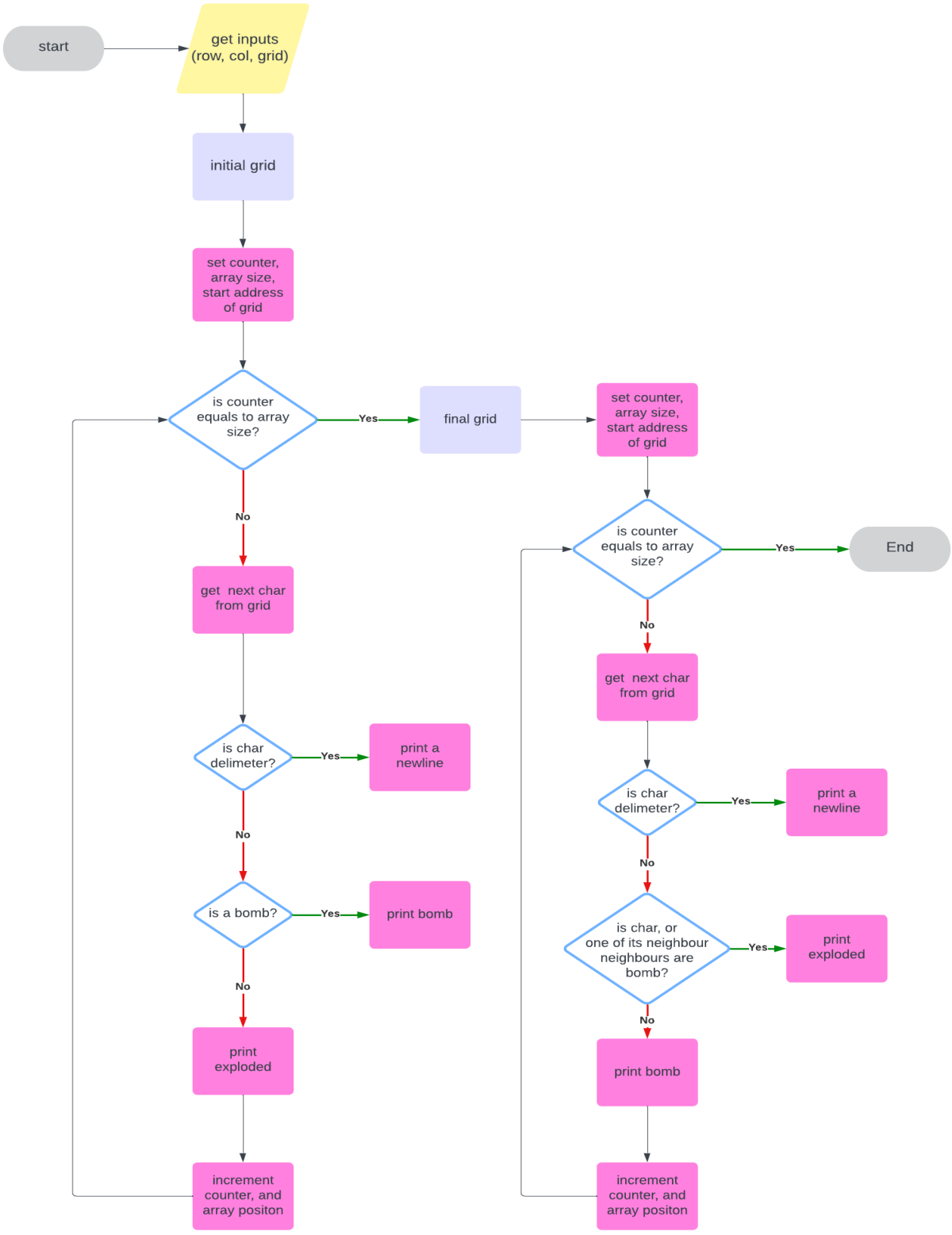
```
Final state:
...OO.OOOO...
.......OOO..O
OO.OO.O.O...O
OOOOOO...O.OO
.OOOOOO.OOOOO
..OOO.OOOOOOO
.OOO...OOOOOO

Goodbye!

------------------- Test - 3 -------------------

Welcome to the BOMBERMAN!

Please enter the number of rows: 2
Please enter the number of columns: 7
Please enter the grid:
.O....._...O..O_

Initial state:
.O.....
...O..O
```

```
Final state:
....OO.
O......

Goodbye!
------------------- Test - 4 -------------------

Welcome to the BOMBERMAN!

Please enter the number of rows: 3
Please enter the number of columns: 5
Please enter the grid:
OO.OO_....O_OO.O._

Initial state:
OO.OO
....O
OO.O.

Final state:
.....
..O..
.....

Goodbye!
```

```
------------------- Test - 5 -------------------

Welcome to the BOMBERMAN!

Please enter the number of rows: 1
Please enter the number of columns: 1
Please enter the grid:
._

Initial state:
.

Final state:
O

Goodbye!
```

```
------------------- Test - 6 -------------------

Welcome to the BOMBERMAN!

Please enter the number of rows: 1
Please enter the number of columns: 1
Please enter the grid:
O_

Initial state:
O

Final state:
.

Goodbye!
```

Flowchart:


start
get inputs (row, col, grid)
initial grid
set counter, array size, start address of grid
is counter equals to array size?
Yes
final grid
set counter, array size, start address of grid
No
get next char from grid
is char delimeter?
Yes
print a newline
No
is a bomb?
Yes
print bomb
No
print exploded
increment counter, and array positon
is counter equals to array size?
Yes
End
No
get next char from grid
is char delimeter?
Yes
print a newline
No
is char, or one of its neighbour neighbours are bomb?
Yes
print exploded
No
print bomb
increment counter, and array positon