

## Assignment 3, Task 1: NQueens problem

### Group 11: Shakhrom Rustamov, Henrietta Helberg

1. We've completely refactored Task1 solution as discussed and made the matrix size dynamic(N Queens on NxN grid) .

Please set ***number\_of\_queens*** parameter (int) to size N you want to run the experiment. Ex: ***int number\_of\_queens <- 8;***

It is interesting to note that in our laptop, experiments with Queen size with 4, 8, 10 worked quite fast. As it gets to 20, it takes a minute to complete. The logs show the progress as it goes through the cycles. When it finishes, we print in the log as:

`"All queens are placed according to rules!"`

2. Results for different Grid Size:

a) N = 4

The screenshot displays the NetLogo environment for the NQueens problem. The console window on the left shows the following log messages:

```
QUEENS:YOU PLEASE KUNDA
Asking Predecessor Queen1 to move.
Queen1: I was asked to update myPosition
Queen1: Finding place for myself. My current position: null
Queen1:No place found
Asking Predecessor Queen0 to move.
Queen0: I was asked to update myPosition
Queen0: Finding place for myself. My current position: null
Queen0: Found a place to move: cell(0)[0:0]
Queen0: booking same row, column and diagonal cells!
Queen0: Checking available places for my successor Queen at column: 1
Queen0: Confirming that there are available position for my successor to move!
Queen0: Replying to my successor - Queen1: I've moved, find your place
Queen1: I was asked to update myPosition
Queen1: Finding place for myself. My current position: null
Queen1: Found a place to move: cell(1)[1:0]
Queen1: booking same row, column and diagonal cells!
Queen1: Checking available places for my successor Queen at column: 2
Queen1: Confirming that there are available position for my successor to move!
Queen1: Replying to my successor - Queen2: I've moved, find your place
Queen2: I was asked to update myPosition
Queen2: Finding place for myself. My current position: null
Queen2: Found a place to move: cell(14)[2:3]
Queen2: booking same row, column and diagonal cells!
Queen2: Checking available places for my successor Queen at column: 3
Queen2: Confirming that there are available position for my successor to move!
Queen2: Replying to my successor - Queen3: I've moved, find your place
Queen3: I was asked to update myPosition
Queen3: Finding place for myself. My current position: null
Queen3: Found a place to move: cell(7)[3:1]
Queen3: booking same row, column and diagonal cells!
globalPositionCheck reflex started is called
All Queens Status: [{"Queen0","Placed!"}, {"Queen1","Placed!"}, {"Queen2","Placed!"}, {"Queen3","Placed!"}]
All queens are placed according to rules!
```

The main display area shows a 4x4 grid with four blue triangles representing the queens at positions (0,1), (1,3), (2,0), and (3,2). The bottom status bar shows the file 'gto.gnd' and a search bar.

### 3. b) N = 8

Experiment: 67655 cycles elapsed

Models: Library models (229), Plugin models (31), User models (11)

Interactive console: Console

```

Queen6: Checking available places for my successor Queen at column: 7
Queen6: No place is available for my successor to move, asking predecessor: Queen5 to update its pos!
Queen6: Deleting my position data first!
Queen5: I was asked to update myPosition
Queen5: Finding place for myself. My current position: null
Queen5: Found a place to move: cell(61)[5:7]
Queen5: booking same row, column and diagonal cells!
Queen5: Checking available places for my successor Queen at column: 6
Queen5: Confirming that there are available position for my successor to move!
Queen5: Replying to my successor - Queen6: I've moved, find your place
Queen6: I was asked to update myPosition
Queen6: Finding place for myself. My current position: null
Queen6: Found a place to move: cell(46)[6:5]
Queen6: booking same row, column and diagonal cells!
Queen6: Checking available places for my successor Queen at column: 7
Queen6: Confirming that there are available position for my successor to move!
Queen6: Replying to my successor - Queen7: I've moved, find your place
Queen7: I was asked to update myPosition
Queen7: Finding place for myself. My current position: null
Queen7: Found a place to move: cell(23)[7:2]
Queen7: booking same row, column and diagonal cells!
globalPositionCheck reflex started is called
All Queens Status: [['Queen0', 'Placed!'], ['Queen1', 'Placed!'], ['Queen2', 'Placed!'], ['Queen3', 'Placed!'], ['Queen4', 'Placed!'], ['Queen5', 'Placed!'], ['Queen6', 'Placed!'], ['Queen7', 'Placed!']]
All queens are placed according to rules!
  
```

objects\_display

welcome.html | nqueens.gaml | nqueens\_v2.gaml | stages.gaml

```

1 //
2 * Group 11: Shakhrom Rustamov, Henrietta Hellberg
3 * Assignment 3, Task 1 - NQueens problem.
4 *
5 */
6 model Grid
  
```

### c) N = 20

Experiment: 31211 cycles elapsed

Models: Library models (229), Plugin models (31), User models (11)

Interactive console: Console

```

Queen15: Found a place to move: cell(258)[15:12]
Queen15: booking same row, column and diagonal cells!
Queen15: Checking available places for my successor Queen at column: 16
Queen15: Confirming that there are available position for my successor to move!
Queen15: Replying to my successor - Queen16: I've moved, find your place
Queen16: I was asked to update myPosition
Queen16: Finding place for myself. My current position: null
Queen16: Found a place to move: cell(136)[16:6]
Queen16: booking same row, column and diagonal cells!
Queen16: Checking available places for my successor Queen at column: 17
Queen16: Confirming that there are available position for my successor to move!
Queen16: Replying to my successor - Queen17: I've moved, find your place
Queen17: I was asked to update myPosition
Queen17: Finding place for myself. My current position: null
Queen17: Found a place to move: cell(17)[17:0]
Queen17: booking same row, column and diagonal cells!
Queen17: Checking available places for my successor Queen at column: 18
Queen17: Confirming that there are available position for my successor to move!
Queen17: Replying to my successor - Queen18: I've moved, find your place
Queen18: I was asked to update myPosition
Queen18: Finding place for myself. My current position: null
Queen18: Found a place to move: cell(236)[18:11]
Queen18: booking same row, column and diagonal cells!
Queen18: Checking available places for my successor Queen at column: 19
Queen18: Confirming that there are available position for my successor to move!
Queen18: Replying to my successor - Queen19: I've moved, find your place
Queen19: I was asked to update myPosition
Queen19: Finding place for myself. My current position: null
Queen19: Found a place to move: cell(279)[19:13]
Queen19: booking same row, column and diagonal cells!
globalPositionCheck reflex started is called
All Queens Status: [['Queen0', 'Placed!'], ['Queen1', 'Placed!'], ['Queen2', 'Placed!'], ['Queen3', 'Placed!'], ['Queen4', 'Placed!'], ['Queen5', 'Placed!'], ['Queen6', 'Placed!'], ['Queen7', 'Placed!'], ['Queen8', 'Placed!'], ['Queen9', 'Placed!'], ['Queen10', 'Placed!'], ['Queen11', 'Placed!'], ['Queen12', 'Placed!'], ['Queen13', 'Placed!'], ['Queen14', 'Placed!'], ['Queen15', 'Placed!'], ['Queen16', 'Placed!'], ['Queen17', 'Placed!'], ['Queen18', 'Placed!'], ['Queen19', 'Placed!']]
All queens are placed according to rules!
  
```

objects\_display

welcome.html | nqueens.gaml | nqueens\_v2.gaml | stages.gaml

```

1 //
2 * Group 11: Shakhrom Rustamov, Henrietta Hellberg
3 * Assignment 3, Task 1 - NQueens problem.
4 *
5 */
6 model Grid
  
```

676M of 997M