SUPINFO Academic Dept.

SUPINFO International University

INSTITUTE OF INFORMATION TECHNOLOGY

1GCC – C Language Project

Document content

Subject
Delivery

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Author: SAD

SOMMAIRE

1 CONTEXT

Do you know the Conway's Game of Life ?

- It's a cellular automation devised by the British mathematician John Horton Conway in 1970.
- It's a zero-player game :
  - Its evolution is determined by its initial state, requiring no further input.
- We're gonna develop one in C Language !
- More information is available on Wikipedia :

http://en.wikipedia.org/wiki/Conway's_Game_of_Life

2 SPECIFICATIONS

What are the rules ?
The universe of the Game of Life is an infinite two-dimensional grid of cells.

Each cell is in one of two possible states :

– Live or Dead.

Every cell interacts with its eight neighbors.

– At each new generation, the following transitions occur :
  1. Any live cell with fewer than two live neighbours dies, as if caused by under-population.
  2. Any live cell with two or three live neighbours lives on to the next generation.
  3. Any live cell with more than three live neighbours dies, as if by overcrowding.
  4. Any dead cell with exactly three live neighbours becomes a live cell, as if by reproduction.

2.1 MAIN

The main function start the game. For this exercise, limit the size of the world to 10x10 cells.

At the first generation it will create a world of 10x10 cells and define randomly if each cell is alive or dead.

Between each generation, you must ask if it's necessary to restart the next generation or to leave the game.

2.2 WORLD

The world of this game is composed by cells.
You must create a dedicated function "displayWorld" to display an representation of this world.
You must create a dedicated function "newGeneration" to generate the next step of the world.
In this function you must implement conditions based on cell's neighbors to define if each cell is alive or dead.
For this exercise a world must be a structure.

2.3 CELL

A cell may be alive or dead.
A cell evolves during generations according to it's neighbors.
For this exercise a cell must be a structure.
A cell has a position in the world and a state.

To represent a cell you must use the following symbols :

- Alive state is represented by +
- A new cell born is represented by 0
- Dead state is represented by -

```
Generation 1:
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 0 0
0 - 0 0 - - - - - 0
0 0 0 0 0 - - 0 0 -
0 - - - - - 0 - 0 -

Generation 2:
- 0 + + 0 + + - - -
0 + - + - - + - + 0
+ 0 - - + + - - + 0
- 0 - 0 0 - + - + 0
- 0 + + - 0 + - + 0
- - - - - - 0 - - -
+ - - - - + - + - +
- - - - - 0 0 - - +
+ - - - + - - + + 0
+ - 0 0 - - - - + -

Generation 3:
0 + - + + + + 0 - -
- - - - - - - + - + +
- - - - - - - 0 - - -
- - - - - - - + - - -
- + - + - - + - + +
- 0 0 - 0 - - - - 0
- - - - - + - + 0 -
- - - - 0 + - - - +
- 0 - 0 + 0 0 + - +
- 0 - + - - - 0 + 0

Generation 4:
- - - - - + + + + 0 -
- - - - - 0 - - - + -
- - - - - - 0 + - - -
- - - - - - 0 + - - -
- + - + - 0 - 0 + +
- + + 0 + 0 0 - - +
- - - 0 - + 0 - + 0
- - - 0 - - - - - - +
- - - + - - - + - +
- - - + - 0 - + - +
```

3 INSTRUCTIONS

- Plagiarism is forbidden.
- This work is individual.
- Make accessible his code on a public sharing platform (as GitHub) before the end of the evaluation is forbidden.

Don't abiding by these rules will result in suspension of your assessment and will be considered cheating.

4 NOTATION

Functionalities	Points
Generate a world of 10x10 cells	3
Display the world	3
Cells can be alive or dead	1
Generate a new life cycle	2
Birth by reproduction condition	2
Alive by neighbors condition	3
Death by under-population condition	2
Death by overcrowding condition	2
Code Quality & Conventions	2
TOTAL	**20/20**

5 RETURN

Return your graded exercise as a ZIP archive named as follows:
1GCC_GameOfLife_Campus_IdBooster.zip.
For example: 1GCC_GameOfLife_Troyes_10000.zip
Not following this convention will result in point loss.

You will send the archive **to your Teacher SUPINFO email address and a copy to 1GCC@supinfo.com** to secure your project. Send it **before the 31th March 2015 at 23:59**. After that delay, your graded exercise **will not be corrected and the mark 0 will be assigned to you**.