

Gebze Institute of Technology
Department of Computer Engineering
CSE 241/505
Object Oriented Programming
Fall 2014
Homework # 1
Your First C++ Program
Due date Oct 4th 2014

You will write a C++ program that will simulate the game of life. The game of life is played by a computer with no other players. The game is on a two dimensional board (2D array) with rectangular cells. Each cell is either dead or alive. For each time step, the game decides which cells will be dead or alive for the next time step. The three rules for the cells to be dead/alive are (alive cells are blue, dead cells are white)

- A dead cell with exactly three live neighbors becomes a live cell (birth). The positions marked with yellow below will contain a live cell for the next time step.



- A live cell with two or three live neighbors stays alive (survival). Each blue cell has a two or three alive neighbors below, so they will stay alive.



- In all other cases, a cell dies or remains dead (overcrowding or loneliness).



The cells below will all die (loneliness)



There are many source on the Internet to see more examples and there are many games available for Ubuntu such as “Golly game of life”. Please see them to learn the game.

Your program will do the following

1. You will represent live cells with an X and dead cells with a blank.
2. Your program will ask the name of the file to load the initial cell values and the size of the board.
3. You will also ask for the number of time steps N.
4. The cells will be loaded and the game will show the initial board
5. The user asked to press enter

6. Then using the three rules above, the next time step will be calculated, dead cells and live cells will be decided
7. The new board will be shown and your program will go to step 4, the program will continue for N steps
8. The final board will be written to a new file. The name of the file will be asked to the user.

Test your game with known patterns from <http://www.math.com/students/wonders/life/life.html> such as oscillators, gliders, interesting objects.

Notes:

- Do not use any functions from the standard C library (like `printf`)
- Your program should have only functions and no classes.
- Do not forget to indent your code and provide comments.
- Check the validity of the user input.
- **Test your programs very carefully at least with 10 different initial files and submit the test results too as screen captures.**
- You should submit your work to the moodle page.