

Assignment 3

The Game of Life

Design Document

Purpose

The purpose of the assignment is to implement the *Game of Life*.

The program uses functions, structures, file I / O, as well as **getopt** and **ncurses** libraries .

Design

Start:

generations := 100

infile := stdin

outfile := stdout

toroidal := false

silence := false

rows

cols

While *option* is there in command line argument

 parse the *option*

 If option == 't'

toroidal := true

 Else If option == 's'

silence := true

 Else If option == 'n'

generations := convert *optarg* to integer

 If *generations* <= 0

generations := 100

 Else If option == 'i'

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        infile := open file (optarg) for reading
    Else If option == 'o'
        outfile := open file (optarg) for writing
    End While

    Read rows and columns numbers from the input file
    Universe_A := uv_create(rows, cols, toroidal)
    Universe_B := uv_create(rows, cols, toroidal)
    uv_populate(Universe_A, infile)
    If silence == false
        Initialize ncurses library
    For each gen from 1 to generations
        If silence == false
            Clear ncurses buffer
            For each cell in Universe_A
                Put value of cell to ncurses buffer
            Refresh ncurses buffer
            Sleep 50000 microseconds
            For each cell in Universe_A[row][col]
                census := uv_census(Universe_A, row, col)
                if Universe_A[row][col] is alive AND (census == 2 OR census == 3)
                    uv_live_cell(Universe_B, row, col)
                Else if Universe_A[row][col] is dead AND (census == 3)
                    uv_live_cell(Universe_B, row, col)
                else
                    uv_dead_cell(Universe_B, row, col)
            End For
            Swap Universe_A and Universe_B
        End for
    End for

```

`uv_delete(Universe_A)`

`uv_delete(Universe_B)`

Stop