**CONWAYS GAME OF LIFE**

Project: Conways Game of Life (PAHSE-I)

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Course:Operating System

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#include <stdio.h>

#include <stdlib.h>

//For Grid View

#define ROWS 20

#define COLS 20

#define GETCOL(c) (c%COLS)

#define GETROW(c) (c/COLS)

#define D\_LEFT(c) ((GETCOL(c) == 0) ? (COLS-1) : -1)

#define D\_RIGHT(c) ((GETCOL(c) == COLS-1) ? (-COLS+1) : 1)

#define D\_TOP(c) ((GETROW(c) == 0) ? ((ROWS-1) \* COLS) : -COLS)

#define D\_BOTTOM(c) ((GETROW(c) == ROWS-1) ? (-(ROWS-1) \* COLS) : COLS)

typedef struct \_cell //Structure class

{

struct \_cell\* neighbour[8];

char curr\_state;

char next\_state;

} cell;

typedef struct //type of structure

{

int rows;

int cols;

cell\* cells;

} world;

void evolve\_cell(cell\* c) //method of cell

{

int count=0, i;

for (i=0; i<8; i++)

{

if (c->neighbour[i]->curr\_state) count++;

}

if (count == 3 || (c->curr\_state && count == 2)) c->next\_state = 1;

else c->next\_state = 0;

}

void update\_world(world\* w) //method of update

{

int nrcells = w->rows \* w->cols, i;

for (i=0; i<nrcells; i++)

{

evolve\_cell(w->cells+i);

}

for (i=0; i<nrcells; i++)

{

w->cells[i].curr\_state = w->cells[i].next\_state;

if (!(i%COLS)) printf("\n");

printf("%c",w->cells[i].curr\_state ? '\*' : ' ');

}

}

world\* init\_world()

{

world\* result = (world\*)malloc(sizeof(world));

result->rows = ROWS;

result->cols = COLS;

result->cells = (cell\*)malloc(sizeof(cell) \* COLS \* ROWS);

int nrcells = result->rows \* result->cols, i;

for (i = 0; i < nrcells; i++) //working of cells

{

cell\* c = result->cells + i;

c->neighbour[0] = c+D\_LEFT(i);

c->neighbour[1] = c+D\_RIGHT(i);

c->neighbour[2] = c+D\_TOP(i);

c->neighbour[3] = c+D\_BOTTOM(i);

c->neighbour[4] = c+D\_LEFT(i) + D\_TOP(i);

c->neighbour[5] = c+D\_LEFT(i) + D\_BOTTOM(i);

c->neighbour[6] = c+D\_RIGHT(i) + D\_TOP(i);

c->neighbour[7] = c+D\_RIGHT(i) + D\_BOTTOM(i);

c->curr\_state = rand() % 2;

}

return result;

}

int main() //main method and calling functions

{

srand(3);

world\* w = init\_world();

while (1)

{

system("CLS");

update\_world(w);

getchar();

}

}