

```

1  #include "decl.h"
2  #include <stdio.h>
3  #include <string.h>
4  #include <stdlib.h>
5
6  /*Stores the current number of generations*/
7  static int currentGeneration = 1;
8
9  /**
10 * Outputs the current state of the grid.
11 * @param grid The grid to print.
12 * @param rows The number of rows in the grid.
13 * @param cols The number of columns in the grid.
14 */
15 static void display(char *grid, int rows, int cols)
16 {
17     char temp;
18     for (int i = 0; i < rows; i++) {
19         for (int j = 0; j < cols; j++) {
20             temp = *(grid + i * rows + j);
21             printf("\t%c ", temp);
22         }
23         printf("\n");
24     }
25     printf("\n");
26 }
27
28 /**
29 * Displays n generations to the player
30 * @param state The current state of the game
31 * @param nextState The next state of the game
32 * @param gen The number of generations to produce
33 * @param rows The number of rows in the grid
34 * @param cols The number of columns in the grid
35 * @param info The PlayerInfo struct to update as needed.
36 * @param displayInitialState Determines if the initial state of the board should be
37 * displayed
38 */
39 void displayGenerations(char *state, char *nextState, int gen, int rows, int cols,
40 struct PlayerInfo *info, bool displayInitialState)
41 {
42     char buf[BUFFER_SIZE];
43     int additional = 0;
44     bool isValid = FALSE;
45
46     /*Display the initial state*/
47     if (displayInitialState) {
48         printf("Initial State: \n");
49         display(state, rows, cols);
50     }
51
52     for (int i = 0; i < gen; i++) {
53         /* Prevent redundant computation if all the cells are inactive by terminating */
54         if (!generations(state, nextState, rows, cols)) {
55             printf("After generation %d, all cells in the board are inactive.\n", i);
56             exit(1);
57         }
58         /* The next state becomes the current state after each iteration*/
59         memcpy(state, nextState, sizeof(char) * rows * cols);
60         printf("Generation %d: \n", currentGeneration++);
61
62         /* Display the current state after updating */
63         display(state, rows, cols);
64     }
65
66     printf("Would you like to see more? Enter 'yes' or 'no' >> ");
67     scanf("%s", buf);
68     isValid = (strcmp(buf, "yes") == 0 || strcmp(buf, "no") == 0);
69 }

```

```

68     /*Prompt the user for a valid response if necessary*/
69     while (!isValid) {
70         printf("Please enter 'yes' or 'no' >> ");
71         scanf("%s", buf);
72         isValid = (strcmp(buf, "yes") == 0 || strcmp(buf, "no") == 0);
73     }
74
75     if (strcmp(buf, "yes") == 0) {
76         printf("Enter the number of generations >> ");
77         scanf("%s", buf);
78         isValid = sscanf(buf, "%d", &additional);
79
80         /*Prompt the user for a valid response if necessary*/
81         while (!isValid) {
82             printf("Please enter a valid Integer >> ");
83             scanf("%s", buf);
84             isValid = sscanf(buf, "%d", &additional);
85         }
86
87         /*Update the number of generations in the struct*/
88         info->numGenerations += additional;
89
90         /*Recurse for the additional generations*/
91         displayGenerations(state, nextState, additional, rows, cols, info, FALSE);
92     } else {
93         return;
94     }
95 }

```