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1 // TacTacToe solution checker by Chip Henderson for SMU CS7343
2
3 #include <pthread.h>
4 #include <stdio.h>
5 #include <stdlib.h>
6 #define NUM_THREADS 3
7
8 char gameBoard[9];
9 int solutionArray[7]; // consists of row, row, row, col, col, col, diag
10
11 void intro() // Welcomes user and sets up the game with user input
12 {
13     printf("Welcome to Tac-Tac-toe\n");
14     printf("Enter a game board such as X000X000X\n");
15
16     gets(gameBoard);
17     printf( "\nYou entered: %s", gameBoard);
18 }
19
20 void *rowCheck() // Checks each row for possible winner, updates solution array
21 {
22     int i = 0;
23     int j = 0;
24
25     for (j = 0; j < 7; j+=3)
26     {
27         if (gameBoard[j] == gameBoard[j + 1] && gameBoard[j + 1] == gameBoard[j +
28 2]) {
29             solutionArray[i] = gameBoard[j];
30         }
31         else {
32             solutionArray[i] = 0;
33         }
34         i++;
35     }
36 }
37 void *columnCheck() // Checks each column for possible winner, updates solution
38 array
39 {
40     int i = 3;
41     int j = 0;
42
43     for (j = 0; j < 3; j++)
44     {
45         if (gameBoard[j] == gameBoard[j + 3] && gameBoard[j + 3] == gameBoard[j+6])
46         {
47             solutionArray[i] = gameBoard[j];
48         }
49         else {
50             solutionArray[i] = 0;
51         }
52         i++;
53     }
54 }
55 void *diagCheck() // Checks each diagonal for possible winner, updates solution
56 array
57 {
```

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56     if (gameBoard[0] == gameBoard[4] && gameBoard[4] == gameBoard[8]) {
57         solutionArray[6] = gameBoard[4];
58     }
59     else if (gameBoard[2] == gameBoard[4] && gameBoard[4] == gameBoard[6]) {
60         solutionArray[6] = gameBoard[4];
61     }
62     else {
63         solutionArray[6] = 0;
64     }
65 }
66
67 int main()
68 {
69     intro();
70
71     // Setup the threads
72     pthread_t tid[NUM_THREADS];
73     pthread_attr_t attr;
74
75     pthread_attr_init(&attr);
76
77     // Runs each function as it's own thread
78     pthread_create(&tid[0], &attr, rowCheck, NULL);
79     pthread_create(&tid[1], &attr, columnCheck, NULL);
80     pthread_create(&tid[2], &attr, diagCheck, NULL);
81
82     int j;
83     for (j = 0; j < NUM_THREADS; j++) { // Ensures each thread is joined
84
85         pthread_join(tid[j], NULL);
86
87     }
88
89     int solutionSum = 0;
90     int i;
91
92     for (i = 0; i < 7; i++) {
93         // Adds values so winner can be evaluated as single value instead of array
94         solutionSum += solutionArray[i];
95     }
96
97     if (solutionSum == 0) {
98         printf("\nThere is no winner!\n");
99     }
100     else if (solutionSum == 88) {
101         printf("\nWinner is X!\n");
102     }
103     else printf("\nWinner is O!\n");
104
105     pthread_exit(NULL);
106
107     return 0;
108 }
```