project[6]: functions
Due Tuesday, 3/29/2016, 12:59:59pm

Project Goals

The goals of this project are to explore the use of functions.

Important Notes:

1. **Comments:** Header comments are required on all files and recommended for the rest of the program. Points will be deducted if no header comments are included.

Problem 1

For this project you will write a program that implements the game of Tic-Tac-Toe. Your program should go through the following steps:

1. Generate an empty Tic-Tac-Toe table (3x3 matrix)
2. Run a loop as long as none of the player has placed three in a row and the table is not full
    a. Display the current layout of the table
    b. Ask the user (select player 1 and player 2 alternatively) to enter his/her selection (the location in the table where the X or O should be placed)
    c. Check that the user entered a legal option (an empty cell); if the selection is on a cell that is already occupied, the program should ask the user to enter the option again
    d. Update the table with the user provided option
3. If the above loop ends because one of the player has placed three in a row, the program should print a winning message of that player (see below). Else, it should print the following : `"Game over, no player wins."`

The program should function as follows (items underlined are to be entered by the user):

```
This program plays the game of tic-tac-toe
The current state of the game is:
Column:1   2   3
Row:   ___ ___ ___
      |   |   |   |
1     |   |   |   |
      |___|___|___|
      |   |   |   |
2     |   |   |   |
      |___|___|___|
      |   |   |   |
3     |   |   |   |
      |___|___|___|
```

```
Enter the section of X for Player 1 [row,col]: 1,2

The current state of the game is:

Column:1   2   3
Row:   ___ ___ ___
      |   |   |   |
1     |   | X |   |
      |___|___|___|
      |   |   |   |
2     |   |   |   |
      |___|___|___|
      |   |   |   |
3     |   |   |   |
      |___|___|___|

Enter the section of 0 for Player 2 [row,col]: 1,2
Invalid selection
Enter the section of 0 for Player 2 [row,col]: 2,2

The current state of the game is:

Column:1   2   3
Row:   ___ ___ ___
      |   |   |   |
1     |   | X |   |
      |___|___|___|
      |   |   |   |
2     |   | 0 |   |
      |___|___|___|
      |   |   |   |
3     |   |   |   |
      |___|___|___|

…

Enter the selection of X for Player 1 [row, col]: 1,3
The current state of the game is:

Column:1   2   3
Row:   ___ ___ ___
      |   |   |   |
1     | X | X | X |
      |___|___|___|
      |   |   |   |
2     | 0 | 0 |   |
      |___|___|___|
      |   |   |   |
3     | X |   | 0 |
      |___|___|___|

Congratulations, Player 1 wins!
```

Constraints: your program should use the following functions:

- `create_clear_table`: this function should take as input a 3x3 array and clear it out for the beginning of the game. You are free to chose the type of the array and how you store the empty, 0 or X.
- `check_table_full`: this function takes as input the table array and returns true or false depending on whether all the cells are occupied or not
- `check_three_in_a_row`: this function takes as input the table array and returns 0 if no player has three in a row (on rows, columns, or diagonals) or the ID of the player (1 or 2) who has three in a row (three Xs represent player 1, three 0s represent player 2)
- `display_table`: this function takes as input the table array and prints out the current status as shown above
- `check_legal_option`: this function takes as input the table array and the option currently entered by the user and returns true or false depending on whether the option is valid or not
- `update_table`: this function takes as input the table array and the option currently entered by the user and updates the table with the latest entered move

Your program should be saved in a file called `tictactoe.c`.

Challenge: Make your program run in a loop. This means, that at the end of the game, it should ask the user if he/she wants to play again. If yes, then the table should be reset and a new game started. Your challenge program should be saved in a file called `tictactoe_challenge.c`. You should also schedule a time with your TA to demo your challenge assignment.

Submission details

The project needs to be submitted by Tuesday, 3/29/2016, 12:59:59pm.

To submit your project, you will have to save your project files to an ECC machine using the Linux VM or the nomachine client:

- create a directory called "project6"
- save your *.c files in that directory
- save your description file into that directory
- DO THIS ONCE: Install the submission script ***(don't type the '>' symbols)***
  > cd ~
  > wget http://www.cse.unr.edu/~newellz2/submit
  > chmod +x ./submit
- TO Submit:
  > cd project6
  > ~/submit

The submission script copies all files in the current directory to our directory. You may submit as many times as you like before the deadline, we only keep the last submission.

Academic Honesty

Academic dishonesty is against university as well as the system community standards. Academic dishonesty includes, but is not limited to, the following:

Plagiarism: defined as submitting the language, ideas, thoughts or work of another as one's own; or assisting in the act of plagiarism by allowing one's work to be used in this fashion.

Cheating: defined as (1) obtaining or providing unauthorized information during an examination through verbal, visual or unauthorized use of books, notes, text and other materials; (2) obtaining or providing information concerning all or part of an examination prior to that examination; (3) taking an examination for another student, or arranging for another person to take an exam in one's place; (4) altering or changing test answers after submittal for grading, grades after grades have been awarded, or other academic records once these are official.

Cheating, plagiarism or otherwise obtaining grades under false pretenses" constitute academic dishonesty according to the code of this university. Academic dishonesty will not be tolerated and penalties can include canceling a student's enrollment without a grade, giving an F for the course, or for the assignment. For more details, see the University of Nevada, Reno General Catalog.