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Algorithms and Data Structures – Noughts and Crosses Coursework Report

Introduction

The objective that this coursework required to be completed was to create a text-based game of Noughts and Crosses, programmed in C, that may be played between two players. My game allows two players to play a traditional game of Noughts and Crosses and then either allows another game to be played, the replaying of all moves from any previous games or the exiting of the game. After a player makes their choice of move in a game and before the other player may make their next move, the original player may decide to first undo their chosen move and then may also select to redo it if they have changed their mind.

Design

For the software of my game I used various different types of algorithms and data structures. To allow all previously played games to be able to be displayed I first used a structure to hold the all details of a played game, including the players' names and integer arrays of both the player's choices of moves and of whether it was the X or O player on those moves. I then created an array of this structure so as to be able to hold the data of multiple played games. I also used a char array for holding the nine different values of the game board so that they could easily be updated from their original 1 to 9 as a player chose their next move, as well as if they decided to undo or redo their moves.

Enhancements

With more time, one of the features that I would have added to my Noughts and Crosses game would have been to be able to undo and redo the moves taken by players back to the initial game play, where the board values are 1 to 9. This is different from what I did manage to implement which was just the undoing and then redoing of the move previously taken by a player. I would also have liked to have been able to allow players to decide the size of board that they wish to play on from a list of varying sized boards and then have implemented my game to be work using the chosen size of board. A final possible enhancement I had thought about was to have created an automated player that a solo person would be able to play against.

Critical Evaluation

I believe that the array of the game structure that I created was a good feature as it allowed me to be able to overcome a problem with getting whole game data that I was having. This problem was because I was trying to use an array of a structure that recorded only the data of each move in a game that I had created previously. Something that is in my code that I think doesn't work that well is that before every game and before every replay of a game the game board must be reset with the original chars ('1-9'). This resetting must be done as if it is not done the array of chars will contain the values of the final board from the previous game and the new game or the replay of a particular game will not work properly.

Personal Evaluation

I am happy with the Noughts and Crosses game I have been able to create for my coursework. I have learned how to use structures as an array so as to be able to store the complete data of multiple played games and I also feel as if I have improved my knowledge of and my programming skills in the C language. While working on implementing previous games to be able to be replayed, I struggled with getting each of the players moves to display correctly. However, by spending more time on this portion of the coursework, reviewing previous labs and also using the internet to search for specific errors that I was getting, I managed to overcome the problems I was having and get this part of my game to work in the way that I had wanted.