**Algorithms & Data Structures Coursework Report**

**Tic Tac Toe implementation in C**

*Introduction*

* Problem: implement a game of tic tac toe in c
* Features implemented:
  + Working game for two players
  + Saving of previous games

*Design*

* From the top:
* Decided to go with a 2d array of chars rather than a 1d array numbered 1-9 because it’s easier for at least me personally to think of the board in a row and column manner similar to battleship or chess, as well as to evaluate win conditions and valid moves, made the board, current player & moves global because they’re accessed by so many functions it’d be a pain to keep passing them around, output path so it’s at the head of the file and easy to find
  + Looked at some examples of implementations online, decided I Definitely didn’t like this due to the long line of else ifs <http://www.cprogrammingnotes.com/question/tic-tac-toe-game.html>
* Tried to make it extensible by chunking up the program into small functions
* Made the variable keeping track of the player a char so I wouldn’t have to do any further work in setting the board pieces and I couldn’t see any benefit making it a bool which May be smaller in theory but is stuffed to be a byte anyway. Also the scope of the program isn’t such that the performance loss using a char instead of a bool would be in any way noticeable.
* start() cut out of main to support replays without messy recalls to main
* drawboard() uses a simple nested for to draw the gameboard, didn’t include any fancy extra lines to section off each space because I didn’t think it was a good use of my time and the gameboard is simple and small enough to not cause confusion
* twoplayers()

*Enhancements*

* Could have built a (smarter) AI, with heuristics to play the game to a draw each time.
* I would have maybe tried to implement a 4x4 board so it would be actually Fun to play, as a 3x3 is extremely easy to play to a draw unless one of the players is a child, or has not played before.

*Critical Evaluation*

* I think it’s serviceable as a 2 player game of tic tac toe

*Personal Evaluation*

* I managed my time poorly and grossly mis-estimated how much time to allocate to the coursework so it isn’t my best work and had I given it more time I think I could have made it a lot more interesting and elegant
* A particular challenge was my relative inexperience in programming in C, specifically in debugging and not being able to catch simple syntax errors as easily as I’m used to
  + i.e. the string and path handling is messy and involves a lot of repeated copying