Fall 2016 **COSC 3P71 Introduction to Artificial Intelligence: project**

Instructor: B. Ombuki-Berman
TA: Adam Balint & Preston A. Engstrom

Term Project: Implementing a Chess program, with a game tree-based AI (**Due: Friday January 13th, 2017)**

Your TASK
Working alone or in a group of two (keep in mind the restrictions with students taking cosc 3p98 as discussed in class), implement a chess-playing program whose system requirements are as follows:

- The program should respect the rules of chess, for example,
  - the movement of pieces (including castling and *en passant*),
  - piece promotion, check
  - checkmate
  - stalemate

  Please obtain a book on chess to verify your understanding of the game!

- You can implement your system on any platform and language you want as long as it is available in our labs. You may have to show me/TA it working in the case of some platforms.

- The program must use a game tree search scheme with alpha-beta pruning. Furthermore, the program should permit user-supplied control parameters, for example, the depth of search.

- *Put effort towards designing an effective board evaluation function.* You should research the literature on computer chess to find strategies used by other systems. You can borrow ideas from the literature (properly acknowledged in your report). I also encourage you to try your own ideas!

- The program should interact with a human player. Moves should be given via board coordinates. At the minimum, the program should dump out the current board as an ASCII table (e.g., upper case = black, lower case = white, space = "-",). Although a graphical user interface is not required, an effective GUI will be positively considered during evaluation.

- Your program should permit any board setup to be used initially. (This is good for testing purposes)

- An option is that your program should dump out the game in terms of a standard chess output text file.

Hand in printouts of all your code, an executable version of the program, and a 6-8 page clearly typed document describing the use and design of your system. Also make an electronic submission for MOSS purpose. Include any references you used during your research.

Note: If there is interest, we could set up a 3P71 Chess Tournament for all the programs implemented. Prizes for the winner!