

**ITCS451: Artificial Intelligence**  
**Project 1: Due October 4<sup>th</sup>, 2017 at 4pm.**

## **1. Introduction**

Checkers, also called Draughts, is a strategy board game. As shown in class, it is a two-player game. There are many variations of the Checkers. For our class, we will implement a player for a “Pool Checkers” game. Pool Checkers is played on an 8x8 board. For the rule of the game, you can read [https://en.wikipedia.org/wiki/Pool\\_checkers](https://en.wikipedia.org/wiki/Pool_checkers) for more details. Note that, for our project, the Kings cannot “fly”. Specifically, it can move backward 1 one step at a time.

## **2. Instructions**

For this project, you must implement two Checkers players: (1) you must use the **Alpha-Beta pruning algorithm** learned in class, and (2) your player for the tournament player. You are to use Java programming language. For this project, you can work in a team for **up to two people**. **If your codes are found to used code from the other people by the plagiarism test, you will get 0 point for the project, and will be reported to the faculty of ICT board for further disciplinary punishment.**

Note that, if you have any question regarding this project, you should contact Aj. Apirak.

### *2.1 Starting Codes*

For this project, you will be given the following Java classes:

AlphaBetaPlayer, CheckerBoard, CheckerBoardConstants, CheckerPlayer, Checkers, DisplayPanel, DoubleObjectPair, HUMANPlayer, Location, Move, PlayerThread, RANDOMPlayer, and Utils.

For the details of each class, you can read the provided Java Document for additional details.

### *2.2 AlphaBetaPlayer*

For this project, you have to complete this class. You are to implement its calculateMove function. You must implement this class based on the Alpha Beta Pruning algorithm learned in class. Note that, you may add any other private functions in this class. We have provided a universal scoreCheckerBoard in the Utils class for you to use. You must use this function for the AlphaBetaPlayer class. If you use any other function, we will not be able to correctly test your program.

### *2.3 Tournament Player*

For this project, you must also implement a player for the tournament. We will organize and run a tournament of Checkers. The tournament will be announced after all the players are handed in. You may use any algorithm to implement this code. You may also use your AlphaBetaPlayer with your own scoring function. But, it must extend the CheckerPlayer class. The top three winners will receive the special awards from Aj. Apirak.

## *2.4 How to run the code*

The main class of the project is Checkers.java. To run it you use

```
java Checkers [Red Player] [Black Player] <-options>
```

For example, if you want to play against your friend, where each player get 1 minute to think, you can evoke it with

```
java Checkers -human -human -60000
```

For options, please read the java document for further instructions.

## **3. What to hand in**

You must hand in two Java files: (1) AlphaBetaPlayer.java, and (2) the tournament player. For the tournament player, you must use your last name in capital letter following by Player as [LASTNAME]Player. Note that if I am submitting my tournament player, it will be named “HOONLORPlayer.java”. You must also hand in a readme.txt file. In the readme, you must list your team members’ names.