Cairo University
Faculty of Computers &Information
Course: Artificial Intelligence

General Instructions:

- Students work in groups of 3-4 for their project. Students have to be from the same lab or from other lab taught by the same TA.
- Game should be implemented to be played in Human vs. Computer mode. Games that don't include this playing mode will not be graded.
- Students should utilize min-max algorithm to decide on computer moves. Alpha-Beta Pruning is a plus. No other algorithms allowed in this project.
- Each project is graded based on the availability of:
  - A game controller that organizes the game by switching roles between the two players, receives user's play, change the game board, and declare End of Game. (2 Points)
  - Suitable knowledge representation for the game state. (2 Points)
  - Adequate utility function that evaluates current game state with respect to a given player. A positive utility denotes a good state while a negative one denotes a bad state. The larger the utility, the better the state. The utility function for a player A typically equals negative the utility function for a player B. (2 Points)
  - Basic Min-Max implementation (You are allowed to use the draft implementation that was illustrated in your section). (2 Point)
- Each of these points is worth 2 points.
- Project Bonus (3 Points):
  - User interface in any language (Java, C#...etc) (2 Bonus)
  - Alpha-Beta Pruning (1 Bonus)
- Submission of the project will be on Acadox. Projects that are not submitted through Acadox before deadline will not be graded.
- Projects submitted on Acadox will be checked against each other and against possible implementations on the web. Similar projects will not be discussed (Both original and copy projects).

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Place Three Game

(Quarto Game Modified Version)

Game Description:

Place Three Game! has a 3×3 board and 8 pieces. Each piece has three attributes – color, shape, and height – so each piece is either black or white, tall or short, square or round. The object is to place the third piece in a row in which all three pieces have at least one attribute in common & The row could be diagonal as well

Pieces:

Black & Round & Tall	White & Round & Tall
Black & Round & Short	White & Round & Short
Black & Square & Tall	White & Square & Tall
Black & Square & Short	White & Square & Short

How the game goes on

Players move alternatively, placing one piece on the board; once inserted, pieces cannot be moved.

Win States

Complete a line of 3 pieces that are similar at least about one of the three described characteristics such as 3 black pieces, 3 white pieces, 3 tall pieces, 3 round pieces, 3 square pieces. The line may be vertical, horizontal or diagonal. The winner is the player who places the third piece of the line

Draw State

The game finishes in a draw when nobody reaches the objective after placing the 8 pieces (One cell will be empty).