**ARTIFICIAL INTELLIGENCE**
**CSL-333**
**ASSIGNMENT 5: ALLCONNECT GAME (Phase 2)**

I have implemented minimax search with cutoff and alpha beta pruning. The evaluation function is a weighted sum of certain features. The features have been taken as follows –

Feature 1 – difference of scores of both players.
Feature 2 – difference of the number of k-1 consecutive match followed by a '.' of both players.
Feature 3 – is computed in the following manner –
I compute the difference of the potential scores (by considering '.'s between consecutive 'X's and 'O's) for a particular row, column or diagonal – let's call this measure eval. Then, a score is computed which is the sum of weighted eval such that more weight is given to eval for near center columns and equal weights given to eval for the rows and diagonals. This score is our third feature.

The suitable weights for the features come out to be 1,0,1 for the 3 features respectively, that is I are not using feature 2 anymore, and suitable depth for minimax come out to be 6.

Also, while choosing the child nodes at a particular node during alpha beta pruning, some states have been given preference over others (center column filling has max priority, then next to center columns and so on). The weights and depth for minimax were chosen by competing our player with the random player and other clients.

I had also implemented UCT algorithm for our player but I didn't get good results. UCT was tried for different maximum iterations, different heuristic functions similar to those used in minimax, different depth levels and different simulation techniques.