Artificial Intelligence Lab (CS 236)

Practice Assignment - 8

Instructions
1. This is only for practice. No need to submit it.
2. Your progress will be reviewed by the Teaching Assistants.

1. Implement PSO for the following problem:
   Divide the N students in k groups based on their marks in the course of artificial intelligence such that diversity in each group is minimised. After convergence, report the group assignment number of each student (along with the diversity value in each group) and analyse the performance metrics such as convergence rate, solution quality, and computational time.

2. You are required to implement the Minimax algorithm along with Alpha-Beta Pruning for a two-player game of your choice. The game should have a well-defined state space and should be suitable for demonstrating the effectiveness of both algorithms.

   (a) Implement the game rules: Create the necessary data structures and functions to represent the game state, allow players to make moves, and determine when the game is over. Define an evaluation function to estimate the desirability of a game state for the maximizing player.

   (b) Implement the Minimax algorithm: Write the Minimax algorithm to search the game tree and determine the best move for the maximizing player while assuming the opponent plays optimally.

   (c) Implement Alpha-Beta Pruning: Extend your implementation to incorporate Alpha-Beta Pruning.