

### Glossary-6

1. **Alliances:** These are defined as a union or association formed for mutual benefit among players in a multiplayer game. [1] page: 185, [3]
2. **Alpha-Beta Pruning:** It is defined as an adversarial search technique which computes the standard minimax decision from a minimax tree by pruning away branches that cannot possibly influence the final decision. [1] page: 186
3. **Minimax Algorithm:** It is defined as an adversarial search technique which computes the utility of each terminal state and then iteratively backs up from leaves to the root to compute the minimax decision for MAX player. [2] Slide: 13
4. **Minimax decision:** It is defined as the decision which is obtained by minimax algorithm at the root, an action  $a_1$  is chosen for max because it leads to the state with the highest minimax value under the assumption that the opponent will play perfectly to his/her own advantage. [1] Page: 184
5. **Minimax value:** It is defined as the value computed at each node which is used to determine the optimal strategy and represents the utility of being in the corresponding state. [1] Page: 183
6. **Payoff function:** It is defined as a function which defines the final numeric value for a game that ends in terminal state 's' for a player 'p'. [1] Page: 181
7. **Ply:** In a game parlance, the game tree is one move deep, consisting of two half-moves, each of which is called a ply. [1] Page:164
8. **Pruning:** It is defined as a method of ignoring portions of search tree that make no difference to the final choice. [1] Page: 162
9. **Terminal test:** It is defined as a test which returns true when the game is over and false otherwise. [1] Page: 162
10. **Terminal States:** These nodes are defined as the states where the game has ended. The Terminal test for these states returns true as the game has ended. [1] Page: 162
11. **Zero-sum game:** It is defined as the game where the total payoff to all players is the same for every instance of game. [1] Page: 162

### References:

- [1] Artificial Intelligence, A Modern Approach (AIMA), Third Edition, by Russell & Norvig.
- [2] Instructor notes #8 by professor Berthe Choueiry.
- [3] Alliance definition from Dictionary.