GAMES & STRATEGIES

Introduction

Many practical problems required decision – making in a competetive situation where there are two or more opposing parties with conflicting interest and where the action of one depends upon the one taken by the opponent .

For ex : candidates for an election , advertising and marketing campaigns byn competing business firms, etc.

In a competitive situation the courses of action for each competitor may be either finite or infinite.

Properties of the GAME

- A competitive situation called a **' GAME'** if it has following properties:

  1. There are the finite no. of competitors (participants) called players.

  2. Each player has a finite no. of strategies available to him.

  3. A play of the game takes place when each player employs his strategy.

  4. Every game result in an outcome , e.g., loss or gain or a draw , usually called payoff, to some player

TWO- PERSON ZERO – SUM GAME

When ther are two competitors playing a game ,it is called a 'Two – person game'. In case the no. of players exceeds two, say n, then the game is termed as a 'n- person game'.

Games having the 'zero – sum' character that the algebric sum of gains and losses of all the players is zero are called zero – sum games.
Zero –sum games with two players are called two – person zero – sum games. In this case the loss (gains) of one player is exactly equal to the gain (loss) of the other. If the sum of gains or losses is not equal to zero, then the is of non – zero character.

SOME BASIC TERMS

- PLAYER : The competitors in the game are known as players A player may be individual or group of individuals oe an organisation .

- STRATEGY : A Strategy for a player is defined as aset of rules or alternative courses of action available to him in advance by which player decides the course of action that he should adopt a strategy may be of two types:

  1. Pure Strategy: If the player select the same Strategy each time , then its is refered to as pure strategy. In this case each player knows exactly what the other player is going to do, the objective of the player is to maximise game or to minimise losses.

  2. Mixed Strategy: When the players use a combination of Strategies and each player always kept guessing as to which course of action is to be selected by the other player at particular occasion then this is known as mixed Strategy .

SOME BASIC TERMS

3. OPTIMUM STRATEGY: A course of action or play which puts the player in the most preferred positin, irrespective of the strategy of his competitors,is called an optimum strategy.

4. VALUE of THE GAME : It is the expected payoff of play when all the players of the game follow their optimum strategies. The game is called fair if the value of the game is zero and unfair, if it is non – zero.

5. PAYOFF MATRIX : when the players select their particular strategies , the payoffs can be represented in the form of matrix called payoff matrix. Since the game is the zero-sum therefore the gain of one player is equal to the loss of other and vice-versa. In other words , one player payoff table would contain the same amount in payoff table of other player with the sign changed. Thus,it is sufficient to consruct payoff only for one of the players.