Game Theory

Manik Bhandari
Department of Computational Data Science
Indian Institute of Science
Bangalore, India
manikb@iisc.ac.in

Abstract

My attempt at solving the Problem Sets for Game Theory at IISC 2019.

1 Introduction

1.1 warm-up

1. A game in my understanding is an *interaction* between agents or players. They take some *actions* to achieve some goal (usually the maximization of their expected utility). These actions can be simultaneous or sequential or mixed?, actions can be one step or multi step, their actions and action histories may/may not be visible to others, the players themselves may/may not be rational and/or intelligent.

   In a non-cooperative game, players will not form a coalition with one another and will not play *together* whereas in cooperative GT, players form coalitions and decide to play a defined strategy (to increase their utility).
2. In game theory, we are given a game and we analyze various types of equilibria in the game whereas in mechanism design we are given a social choice function that we want to implement and we design a game that implements it in the optimal case.
3. Intelligence assumes that players are capable of computing the *optimal strategy* (for rational players this strategy is maximizing their expected utility). Rationality assumes that players will play to maximize their expected utility.

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