

Introduction to Game Theory
Exam of May 15th 2015.

Answer the following questions.
Assigned time: 1 hour

1) Define the concept of strategy. Terms "action" and "strategy" are generally synonyms?

2) Argue that an equilibrium in strictly dominant strategies is also a Nash equilibrium.

3) Consider the following case of political competition. There are 30 voters, with different political opinions. Ten voters prefer a right-wing political platform, other 10 voters a centrist platform and the remaining 10 a leftist platform. There are two parties whose purpose is that of collecting the highest number of votes by choosing the appropriate platform (right, center, left). Parties choose simultaneously. If two parties opt for the same platform, voters are indifferent and we suppose they equally share their support to both parties. The same applies to centrist voters when parties adopt opposite and extreme platforms. Otherwise voters prefer the party whose proposed platform is the closest to their preferred platform. Represent this game in normal form and determine its Nash equilibria.

4) Motivation and determination are not evenly distributed in the population. Let us suppose that there are two types of people, the motivated and the lazy. Nature determines the type of each individual. Consider this game between an employee and an employer: with probability $p=1/2$ the employee is motivated and with probability $p=1/2$ he/she is lazy. Type is private information of the employee and it is not observed by the employer. The employee moves first and decides whether to attain a degree in law or not. Graduating is difficult and costs more to lazy than to motivated people. The cost of graduation is 30 to the lazy and 10 to the motivated. The employer chooses whether to hire the employee or not, and it observes employee education. A hired employee earns a wage of 50 as established by collective contracts, regardless of his type. Total payoff to employees are wages net of the costs of education. A motivated type is very productive, regardless of his/her education) and if hired yields a payoff net of the wage of 50 to the employer. A lazy individual instead yields a net payoff of -25. If the firm does not hire payoff is 0 to the employer and coincides with the cost of acquiring education to the employee.

- a) represent this game in extensive form
- b) what kind of game is this?
- c) find all weak Perfect Bayesian Equilibria.