

## Game Theory Day 10

### Homework

*Please complete on a separate piece of paper.*

1. Felix and Oscar share a flat. They have decidedly different views on cleanliness and hence, whether or not they would be willing to put in the hours of work necessary to clean the apartment. Suppose that it takes at least 12 hours of work per week to keep the flat clean, 9 hours to make it livable, and anything less than 9 hours the flat is filthy. Suppose that each person can devote either 3, 6, or 9 hours to cleaning.

Felix and Oscar agree that a livable flat is worth 2 on the utility index. They disagree on the value of a clean apartment – Felix thinks it is worth 10 while Oscar it is only 5. They also disagree on the unpleasantness of a filthy apartment – Felix thinks it is (-10) while Oscar thinks it is (-5). Each person's payoff is the utility from the apartment minus the number of hours worked.

For example, if they both work 6 hours, then the house has been cleaned for 12, leaving it "clean." So the utility for Felix and Oscar is (4,-1) respectively. This is because Felix has a clean apartment for 10 points subtract the 6 hours he worked ( $10 - 6 = 4$ ). Oscar has a clean apartment for 5 points but he worked 6 ( $5 - 6 = -1$ ).

Write a payoff matrix for the players and strategies. Find N.E.

2. Describe a game where there are multiple Nash Equilibria. You may wish to do some research for this via the internet. Come prepared to discuss your game on Monday.