

## Exercise session #9

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### **Problem 1** (*Stackelberg duopoly*)

For the demand function  $p(q) = A - Bq$  and marginal costs  $c$ , let producer 1 be the Stackelberg leader and producer 2 - the Stackelberg follower. Find quantities produced of both producers, the market price and compare them to the cases of monopoly and perfect competition.

### **Problem 2**

You need to hire one employee for your firm. You advertise the job opening and 3 prospective employees apply for the position. Your policy is never to hire an employee before interviewing her. For any of the three applicants, you believe that the value to you of hiring this particular applicant is continuously uniformly distributed in the interval from 100 to 200. You will hire at most one of the prospective employees, and your objective is to maximize your value.

- a. What should your hiring strategy be?
- b. How will your hiring strategy change if the constant cost of interviewing is 20 per interview.

### **Problem 3** (*pure vs. mixed strategies*)

There is a small town with only one pub. On Friday night everyone wishes to go out, however if more than 60% of residents come, the pub gets crowded and all visitors prefer they stayed at home to watch TV. Respectively, if less than 60% of residents come, the pub is nice to be in, and everybody prefers to stay there rather than watch TV. Find the equilibrium in pure and mixed strategies.

### **Problem 4** (battle of sexes with money burning. Bank runs)

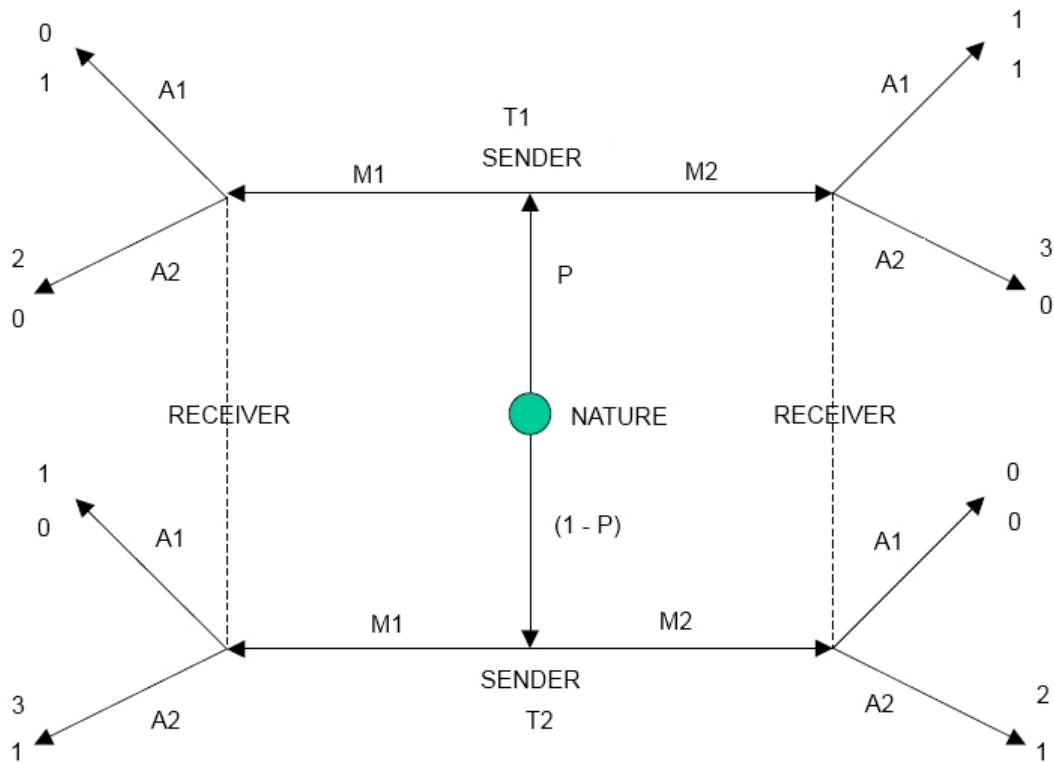
Add the possibility of burning money to the battle of sexes game introduced last class.

### **Problem 5** (*Practice solving game trees*)

**Problem 6** (*signaling game*)

Describe the signaling game in the picture below (players, sequence of moves, players' beliefs and payoffs). Give an example from real life that this game can depict (job market signaling, case of corporate investment, money burning).

- Define each player's strategies
- Find the separating equilibrium.
- Find the pooling equilibrium.



**Problem 7** (*education signaling*)

Consider the setup of the standard education signaling game.

- Write down the model. Explicitly state all assumptions.
- Find separating and pooling equilibria.