

Problem 1

Two firms, Rowchoice Inc. and Colchoice Inc., serve a market for salt and compete through prices. The production of a package has variable costs 0.17 € and (quasi-)fixed costs c . For historical reasons, Rowchoice Inc. may either stay away from the market (resulting in fixed costs of zero) or it may charge 0.18 € or 0.19 € . Colchoice Inc. has to stay in the market and may charge either 0.17 € , 0.18 € , or 0.19 € .

The firms compete for $1,000,000$ consumers. Each consumer is interested in buying one package. All consumers buy their salt from the firm that offers the lowest price. If both firms choose the same price, consumers split equally, i.e., in this case half of them buy from Rowchoice Inc. and the other half buy from Colchoice Inc.

The matrix below contains the profits of the firms for some strategy combinations. (The left number in each cell is the profit of Rowchoice Inc., while the right number is the profit of Colchoice Inc.)

		Colchoice Inc.		
		0.17 €	0.18 €	0.19 €
Rowchoice Inc.	stay away	$0 \setminus -c$	$0 \setminus 10,000 - c$	$0 \setminus 20,000 - c$
	0.18 €	\	\	\
	0.19 €	\	\	\

a) Fill in the missing profits in the matrix.

Now assume $0 \leq c \leq 5,000$.

- b) Is there a weakly dominant strategy for any of the firms? Explain.
c) Is there a strictly dominant strategy for any of the firms? Explain.

Now assume $c = 2,000$.

- d) Reduce the game by iteratively canceling strictly dominated strategies.
e) Find the Nash-equilibrium/-equilibria both in pure and in mixed strategies in the remaining game! Explain.

f) Fill in the blank:

A Nash-equilibrium is a strategy combination such that both players are playing

_____ to the other player's strategy.

g) Fill in the blank

In a Nash equilibrium in mixed strategies, a player assigns positive probability

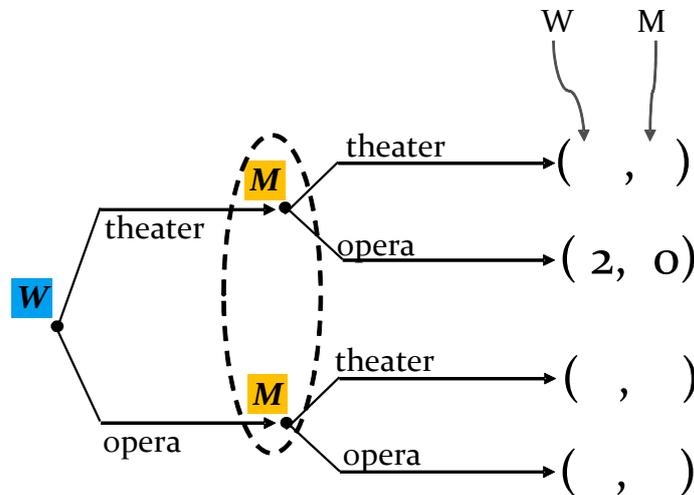
only to pure strategies that are _____, given the other players' Nash equilibrium strategies.

Problem 2

A woman and her husband want to go out tonight. They prefer enjoying the night together but as the man played the whole day with his smartphone, its battery is empty and he does not know for sure for which place his wife bought tickets. It can be either the theater or the opera.

If they match and meet each other in the opera, the man receives a payoff of 3 while his wife gets 2. If they match and meet each other in the theater, the woman gets 3 while her husband gets 2.

If they mismatch, the man receives zero payoff, while his wife receives a disutility of 1, i.e., she has the payoff that she would get if they were matching in the location that she went to subtracted by 1.



- Fill in the payoffs in the figure above.
- Is this a game of perfect or imperfect information? Is it a game of complete or incomplete information? Explain!
- Represent the game in strategic form.
- Determine all Nash equilibria both in pure and in mixed strategies. Is there an equilibrium that you can rule out using credibility arguments?