



B.E. International Program
Faculty of Economics
Thammasat University



EE311 Microeconomics Theory, Semester 2/2019
Homework Assignment #7 | Due date: Sunday 12 April 2020

Instruction:

- 1) Attempt all questions.
- 2) You may study and discuss in group but you have to write up your solutions independently and by handwriting only. Copying and/or Plagiarism is considered as a serious crime in academic arena and it will not be tolerated. If detected, all parties involved receive 'zero.'
- 3) If you have any questions, please feel free to email me at pongpalin@econ.tu.ac.th

Game Theory (CH 14)

Please attempt the following questions from your Textbook (available on Moodle).

The questions are on Page 597 onwards.

- | | |
|-------------------|------------------------|
| Review Question 1 | <u>Briefly</u> Explain |
| Review Question 2 | <u>Briefly</u> Explain |
| Review Question 3 | <u>Briefly</u> Explain |

Problem 14.6

Problem 14.15

Problem 14.23

Answer only Sub-Question (b), i.e. find MSNE.

Q1. Nash equilibrium is a concept where each participant acts according to self-interest, based on what other participant is acting. Under perfect information, each participant will act in a way that gives them the most benefit, based on how other participant had chosen to act. If a participant choose to act in a way that does not constitute to a Nash equilibrium, the result is that all other participants will be worse off since the plan that they had originally chosen was based on the expectation that everyone will act according to the equilibrium.

Q2. Prisoner's game dilemma presents you with conflict between self-interest of a single individual and the interest of all participants as a whole. Most if not all the scenarios presented are similar.

Q3. Dominant Strategy will make you better off than any other participants regardless of what other participants choose to do. Dominated Strategy will allow you to be better off regardless of what other participants choose to do. Practically, there are always a choice that will give you better payoff than the dominated strategy therefore participant will choose other choices.

Q 146

		Kirin			
		630	660	690	720
Asuh	630	180, 180	184, 178	185, 175	186, 173
	660	178, 184	183, 183	192, 182	194, 180
	690	175, 185	182, 192	191, 191	198, 190
	720	173, 186	180, 194	190, 198	196, 196

- A and K no dominant strategy
- A will select ¥720 to be dominated strategy to ¥690
K will select ¥720 to be dominated strategy to ¥690
- A and K will select ¥690 to be dominated strategy to ¥660

- d. A and K will select ¥60 to be dominated strategy to ¥630
 e. Now they are both charging at ¥630 with the Nash equilibrium of (180, 180)

19.15

		Columbia Pictures		
		Beta q	VHS $1-q$	
Sony	Beta p	20, 10	0, 0	$E_s[\text{Beta}] = 20q$
	VHS $1-p$	0, 0	10, 20	$E_s[\text{VHS}] = 10(1-q) = 10 - 10q$

$E_c[\text{Beta}] = 10p \quad E_c[\text{VHS}] = 20 - 20p$

① Sony take Beta if $E_s[\text{Beta}] > E_s[\text{VHS}]$
 $cp = 1$
 $20q > 10 - 10q$
 $q > \frac{1}{3}$

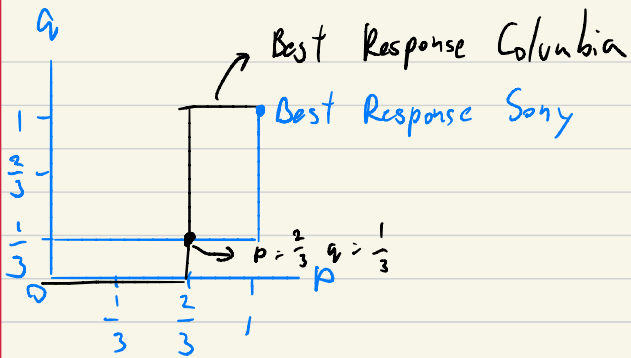
② Sony take VHS if $E_s[\text{Beta}] < E_s[\text{VHS}]$
 $cp = 0$
 $q < \frac{1}{3}$

③ Sony is indifferent when $E_s[\text{Beta}] = E_s[\text{VHS}]$
 $cp \in (0, 1)$
 $q = \frac{1}{3}$

④ Columbia take Beta if $E_c[\text{Beta}] > E_c[\text{VHS}]$
 $cq = 1$
 $10p > 20 - 20p$
 $p > \frac{2}{3}$

⑤ Columbia take VHS if $E_c[\text{Beta}] < E_c[\text{VHS}]$
 $cq = 0$
 $p < \frac{2}{3}$

⑥ Columbia is indifferent when $E_c[\text{Beta}] = E_c[\text{VHS}]$
 $cq \in (0, 1)$
 $p = \frac{2}{3}$



Uses mixed strategy:

p - Sony prob. of selecting Beta is $\frac{2}{3}$
 q - Columbia prob. of selecting beta is $\frac{1}{3}$

Pure Strategy:

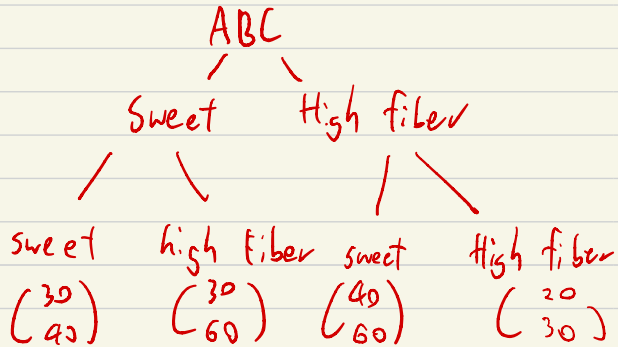
Sony and Columbia select Beta
 Sony and Columbia play VHS

14.23

		XYZ	
		High Fiber	Sweet
ABC	Sweet	50, 60	30, 40
	High fiber	20, 30	40, 60

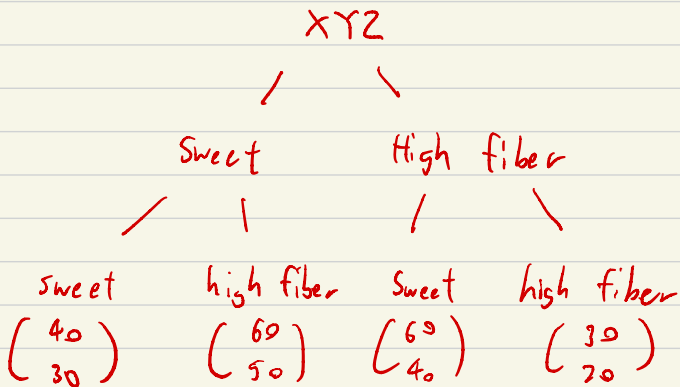
a. Both firms will move simultaneously since unique equilibrium would not occur. This is due to the fact that if ABC selects sweet, XYZ will response by selecting high fiber and vice-versa.

6.



ABC will have the first player advantage since it will select sweet which will give better yield and XYZ will have to respond with High Fiber.

7.



XYZ will NOT have the first player advantage therefore it will have to use dominated strategy since every yields are practically the same.