Assignment 2
Assigned on Sep 22th, 2021. To be submitted on Oct 7th, 2021 before midnight.

Instructions

(1) Please read the instruction carefully. Also take this habit with you into the exam room.
(2) Please read each question carefully and answer the questions straightforwardly. Always provide economic reasons at lease a paragraph for your analysis, or a graph when necessary, even when the question does not indicate so.
(3) Handing and submitting assignments are only available via BE Moodle.

Answering the questions and preparing answer sheets

(1) Answers are to be handwritten, in either digital or analog form, in a blank canvas or any clean paper. Make sure that your handwriting is clearly visible and readable.
(2) There is no need to rewrite the question. Just indicate the question number clearly for each of the answer, such as 1.a).
(3) When done, for the digital case, collage all the pages into a single PDF file. For those who write on sheets of paper, take photo of all pages then convert all of them into a single PDF file as well.
(4) Name your PDF file as StudentID_YourNickname, such as 640123456_Bo.

Submitting your answers

(1) Make sure your file does not exceed 10MB. This is the maximum file size for BE Moodle upload.
(2) Login to BE Moodle, head into the course, then the assignment topic.
(3) Choose your file to submit. Done. There will be timestamp for your upload date and time, so please make sure to not submit later than that.

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1. Belle is choosing ham (h) and cheese (c), which is assumed to be substitutable goods for her. Her total utility from each product is given in the table here.

Quantity	Total utility from ham (TU_h)	Total utility from cheese (TU_c)
1	15	12
2	26	21
3	35	27
4	41	32
5	45	35
6	48	37
7	49	38

Answer the following questions.

1.a) If Belle has $7 budget and both ham and cheese cost $1 each, how many units of ham and cheese she should purchase to maximize her utility? Explain your method clearly.

1.b) Provide a clear explanation why her utility will not be maximized if the condition that you apply in part a. is not yet satisfied.

1.a)

Q	TU_h	MU_h	TU_c	MU_c	choice	Remaining budget
1	15	15	12	12	Ham	6
2	26	11	21	9	Cheese	5
3	35	9	27	6	Ham	4
4	41	6	32	5	Cheese	3
5	45	4	35	3	Ham	2
6	48	3	37	2	Cheese	1
7	49	1	38	1	Ham	0

Belle will maximize her marginal utility (MU) per dollar when making purchases on the margin (her next incremental purchase)

As both goods cost $1 per unit, MU per dollar are represented as MU_h for marginal utility per dollar for ham and MU_c for marginal utility per dollar for cheese and shown in the table above.

Belle has $7 to purchase and she will choose her first unit of consumption from the good that give her highest marginal utility which is ham with 15 utils. Her next unit of consumption will be spend on the remaining goods that gives her the highest MU which appears to be cheese which its MU of 12 utils. Choosing her 4th unit of consumption, Belle is indifferent between ham and cheese because both goods give her equal marginal utility of 9 utils. So, Belle can choose either ham or cheese as her 4th unit and the 5th unit that she will consume will be the one that she does not choose in 4th unit. Suppose she decides to consume cheese as her 4th unit, 5th unit will be for ham.

Consuming the 6th and 7th unit would have the same condition as the consumption of 4th and 5th unit.

In conclusion, Belle that has $7 budget will consume 7 units of goods including 4 unit of ham and 3 units of cheese as both goods cost $1 per unit. Following this decision will maximize her utilities that her total utilities will be 68 utils.

1.b) Following the decision above will give Belle the highest utilities, in other words, the decision above follows the utilities maximizing condition which implies that Belle will maximize her utility by choosing her next incremental purchase that give her the highest marginal utilities. Therefore, if Belle choose to purchase on the good that does not give her the highest utilities compare to the one that she did not choose, her utilities will not be maximize for sure.

2.a) To make the equilibrium is on point B, the condition that marginal rate of substitution equal to the price of good x over price of good Y must be satisfied.

$$MRS_{x,y} = \left|\frac{\Delta Y}{\Delta X}\right| = \left|\frac{P_x}{P_y}\right|$$

$$\left|\frac{9-18}{4-2}\right| = \left|\frac{P_x}{10}\right|$$

$$\frac{9}{2} = \frac{P_x}{10}$$

$$P_x = \frac{9}{2} \cdot 10^{5} = 45$$

The consumer equilibrium at point B has the price of nut or $P_y = 10$ baht per unit and price of avocado or $P_x = 45$ baht per unit where the quantity of nuts and avocado are 9 and 4 respectively.

2.b) Budget = ? ; $P_x = 180$, $X = 4$, $Y = 9$

Firstly, find the price of nut of P_y by using the same condition in 2.a that $MRS_{xy} = P_x / P_y$.

$$MRS_{x,y} = \left|\frac{\Delta Y}{\Delta X}\right| = \left|\frac{P_x}{P_y}\right|$$

$$\frac{9}{2} = \frac{180}{P_y}$$

$$P_y = \frac{180}{9} \cdot 2 = 40$$

At point B where quantity demanded for nut (Y) and quantity demanded for avocado (X) are 9 and 4 respectively. The price of nut is 40 baht per unit and the price of avocado is 180 baht per unit.

A consumer must have a budget of $I = P_x X + P_y Y$

$$= 180(4) + 40(9)$$

$$= 1080 \text{ baht.}$$

2.c) Average marginal utility per unit of avocado $= \left|\frac{\Delta Y}{\Delta X}\right| = \frac{MU_x}{MU_y}$

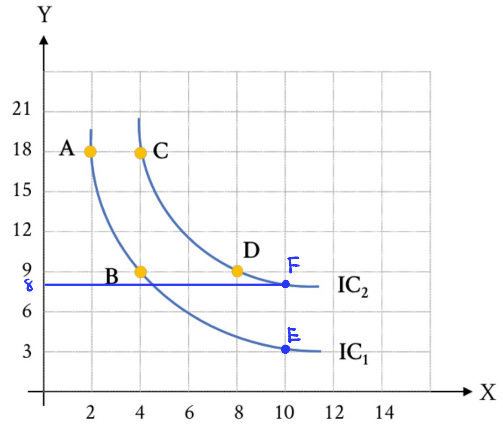
$$\left|\frac{9-18}{8-4}\right| = \frac{MU_x}{MU_y}$$

$$2.25 = \frac{MU_x}{MU_y}$$

The MU_x is 2.25 times to MU_y.

or 1 avocado is worth to 2.25 units of nut.

2.d)



On IC_1 that yield 8 utils, as the consumer consume more of avocado, it will move from bundle A to B to E respectively. It is the same on IC_2 which consumer change from bundle C to D to F as he/she consume more and more avocado.

$MRS_{xy}(B) = |\Delta Y/\Delta X| = |9-18/4-2| = 4.5$

$MRS_{xy}(E) = |3-9/10-4| = 1$

$MRS_{xy}(D) = |9-18/8-4| = 2.25$

$MRS_{xy}(F) = |8-9/10-8| = 0.5$

Law of Diminishing Marginal Utility states that if the consumption of good or serviced increases, the satisfaction of marginal utility also increases but at a decreasing rate until it reach zero. As you can see on the calculation of MRS_{xy} above from point B to point E, at first, on point B, this consumer is very happy to trade 4.5 unit of nuts for 1 unit of avocado because this consume is happy to consume more avocado. As this consumer consume more avocado, his bundle move from point B to point E. At point E, his MRS_{xy} decreases from 4.5 to 1 meaning that at point E, this consumer is happy to trade 1 unit of nut for 1 addition unit of avocado. We can see that his sacrifaction of nuts for 1 addition unit of avocado has been decresed from time to time as she consume more of avocado. This explanation is linked to the law of diminishing marginal utility that this consumer's marginal utility will be increase at a decreasing rate when he consume more of that good.

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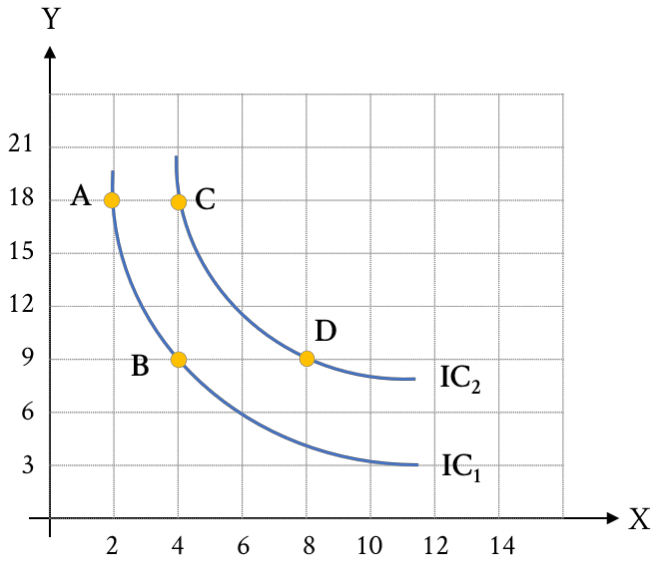
2. A consumer finds that for him/her avocado (X) and nuts (Y) are substitutes. Assumed that this consumer yields 8 and 12 utils on IC_1 and IC_2 respectively, show your work and answer the following questions.



2.a) Measured from point A to B, assumed P_y is 10 baht per unit, how much P_x must be to make you conclude that the consumer's equilibrium is on point B?

2.b) Measured from point A to B, assumed P_x is 180 baht per unit, how much budget does this consumer has to achieve the equilibrium on point B?

2.c) Measured from point C to point D, how much is the average marginal utility per unit of avocado?

2.d) Show that this consumer's utility received from consuming avocado is in accordance with the law of diminishing marginal utility, using any essential information from any point. (But highly recommend that you consider all the points)