Problem Sets 4

1. Optimal Consumption Decision in Utility Maximization Model

1) Biwei's marginal use value for chamomile tea consumption is *MU=-2Q+6,* where *Q* is the box quantity of chamomile tea consumed and takes only integer values. Draw the marginal use value curve and total use value curve for *Q* less than 5. If the price for a box of chamomile tea is $4, how many boxes will Biwei consume per week? If the price drops to $2, how many boxes will Biwei consume per week?
2) Biwei's total use value is now given by $TU = 8\sqrt{Q}$, where *Q* takes only integer values. Draw the marginal use value curve and total use value curve for *Q* less than 5. If the price for a box of chamomile tea is $4, how many boxes will Biwei consume per week? If the price drops to $2, how many boxes will Biwei consume?
3) Both Biwei and Alex share the utility function $TU = \sqrt{Income}$. If Biwei makes $10,000 and Alex makes $40,000 per month, how can their incomes be distributed to maximize social utility?

2. Non-Market Exchange and Economic Efficiency

Watch the Egyptian short film "The other pair" via https://www.youtube.com/watch?v=FGh0iduZOJQ

1) According to the economic principle(s) behind market exchange, why did the poor boy return the lost shoe to the rich boy even though he had yarned for a pair of nice shoes? Is it illegal if he retained the lost shoe?
2) According to the economic principle(s) behind market exchange, why did the rich boy choose to give away his remaining shoe to the poor boy? Would the rich boy give away his remaining shoe had the poor boy chosen not to return his lost one?
3) In the film, as well as in our daily life, the transfer of private property right from one party to another does not always have to involve monetary payments. Generally, any voluntary exchange without violating private property rights can enhance both participants' welfare in the transaction. Please analyze the gains and losses for each boy in the story.
4) In Game Theory, a zero-sum game is a mathematical representation of a situation in which each participant's gain or loss of utility is exactly balanced by the losses or gains of the utility of the other participants. If the total gains of the participants are added up and the total losses are subtracted, they will sum to zero. Did the story end with a zero-sum game? Why or why not?
5) In Welfare Economics, Pareto efficiency or Pareto optimality refers to a state of allocation of resources from which it is impossible to reallocate so as to make any one individual or preference criterion better off without making at least one individual or preference criterion worse off. The concept is named after Vilfredo Pareto (1848–1923), an Italian engineer and economist, who used the concept in his studies of economic efficiency and income distribution. Did the film end with a Pareto efficient outcome? Explain.

Question 3 below is an application of the classical value theory to real-time financial market trading. It is intended for students to better connect the dots between theory and practice.

3. Price Quotes and Bid-Ask Spread

1) A Bid (or buying) price represents the willingness for a buyer to purchase stock at that price.
2) The Ask (or selling) price represents the willingness of a seller to sell shares of stock at that price. The difference between bid and ask price is called spread.
3) Bid-ask spread: a measure of liquidity of the trading activity. A large spread indicates more active trade. A small spread shows less active trade. A negative spread means no trade.
4) The size columns make reference to the number of shares that the buyers or sellers are posting to trade. One reads and states a quote by first reading the highest buying price followed by the lowest selling price.

Bid			Ask		
Size		Price	Price	Size	
4	93,000	4.1200	4.1400	230,000	3
5	341,000	4.1100	4.1500	504,000	6
10	345,000	4.1000	4.1600	700,000	5
7	265,000	4.0900	4.1700	100,000	1
6	123,000	4.0800	4.1800	200,000	6

Question: Based on the information in the table, is this a liquid market? Explain. What does the number mean in the first and last columns? What is the next upcoming most likely price and quantity to be executed in the trading? [Extra: 0.3 points]

Reference

Reading Stock Quotes
https://www.colfinancial.com/ape/final2/home/online_trading.asp

Trading Orders
http://positron-investments.com/en/technical-analysis-basics/trading-orders/

Trading Basics
https://www.sec.gov/investor/alerts/trading101basics.pdf

Nasdaq Quote-Driven Dealers' Market vs NYSE Order-Driven Auction Market
https://www.businessinsider.com/heres-the-difference-between-the-nasdaq-and-nyse-2017-7

201705 Order Book Trading Level 1 https://www.youtube.com/watch?v=-irbx3uBW0o
201705 Order Book Trading Level 2 https://www.youtube.com/watch?v=rCWsmIor5mQ