ECO101A: Introduction to Economics

Tutorial 1

1. Much of the demand for U.S. agricultural output has come from other countries. In 1998, the total demand for wheat was Q = 3244 - 283P. Of this, domestic demand was Q_D = 1700 - 107P. Domestic supply was Q_S = 1944 + 207P. Suppose the export demand for wheat falls by 40 percent.
   U.S. farmers are concerned about this drop in export demand. What happens to the free market price of wheat in the United States? Do the farmers have much reason to worry?

2. The following table shows the average retail price of butter and the Consumer Price Index from 1980 to 2001.

	1980	1985	1990	1995	2000	2001
CPI	100	130.58	158.62	184.95	208.98	214.93
Retail Price of butter (salted, grade AA, per lb.)	$1.88	$2.12	$1.99	$1.61	$2.52	$3.30

   a. Calculate the real price of butter in 1980 dollars. Has the real price increased/decreased/stayed the same since 1980?
   b. What is the percentage change in the real price (1980 dollars) from 1980 to 2001?
   c. Convert the CPI into 1990 = 100 and determine the real price of butter in 1990 dollars.
   d. What is the percentage change in the real price (1990 dollars) from 1980 to 2001? Compare this with your answer in (b). What do you notice? Explain.
3. Suppose demand function for the commodity Q is $\mathbf{Q = 200 - 10P.}$ What is the absolute price elasticity for the demand when P = 15?
4. Suppose demand function for a commodity is $\boldsymbol{Q_d = 51 - 3P}$and supply function is $\boldsymbol{Q_s = 6P - 12.}$ What are the equilibrium price (P^*) and quantity (Q^*)?
5. Suppose government sets price of a commodity higher than its market equilibrium price, then there will be _____.
   - Excess demand
   - Excess supply
   - None these
6. From the demand function $Qd_x = 12 - 2P_x$ (P_x is given in dollars), derive
   (a) the individual's demand schedule and
   (b) the individual's demand curve,
   (c) What is the maximum quantity this individual will ever demand of commodity X per time period?

7. Draw indifference curves that represent the following individuals' preferences for hamburgers and soft drinks. Indicate the direction in which the individuals' satisfaction (or utility) is increasing.

    a. Joe has convex preferences and dislikes both hamburgers and soft drinks.
    b. Jane loves hamburgers and dislikes soft drinks. If she is served a soft drink, she will pour it down the drain rather than drink it.
    c. Bob loves hamburgers and dislikes soft drinks. If he is served a soft drink, he will drink it to be polite.
    d. Molly loves hamburgers and soft drinks, but insists on consuming exactly one soft drink for every two hamburgers that she eats.
    e. Bill likes hamburgers, but neither likes nor dislikes soft drinks.
    f. Mary always gets twice as much satisfaction from an extra hamburger as she does from an extra soft drink.

8. Suppose that Bridget and Erin spend their income on two goods, food (F) and clothing (C). Bridget's preferences are represented by the utility function $U(F,C) = 10FC$, while Erin's preferences are represented by the utility function $U(F,C) = 0.20\ F^2C^2$.

    a. On a graph, with food on the horizontal axis and clothing on the vertical axis, identify the set of points that give Bridget the same level of utility as the bundle (10,5). Do the same for Erin on a separate graph.
    b. On the same two graphs, identify the set of bundles that give Bridget and Erin the same level of utility as the bundle (15,8).
    c. Do you think Bridget and Erin have the same preferences or different preferences? Explain.

9. Debra usually buys a soft drink when she goes to a movie theater, where she has a choice of three sizes: the 8 ounce drink costs $1.50, the 12 ounce drink, $2.00, and the 16 ounce drink, $2.25. Describe the budget constraint that Debra faces when deciding how many ounces of the drink to purchase. (Assume that Debra can costlessly dispose of any of the soft drink that she does not want.)

10. The utility that Meredith receives by consuming food F and clothing C is given by $u(F,C) = FC$. Suppose that Meredith's income in 1990 is $1,200 and the prices of food and clothing are $1 per unit for each. However, by 1995 the price of food has increased to $2 and the price of clothing to $3. Let 100 represent the cost of living index for 1990. Calculate the ideal and the Laspeyres cost-of-living index for Meredith for 1995. (Hint: Meredith will spend equal amounts on food and clothing with these preferences.)

11. Brenda wants to buy a new car and has a budget of $25,000. She has just found a magazine that assigns each car an index for styling and an index for gas mileage. Each index runs from 1-10, with 10 representing either the most styling or the best gas mileage. While looking at the list of cars, Brenda observes that on average, as the style index rises by one unit, the price of the car increases by $5,000. She also observes that as the gas mileage index rises by one unit, the price of the car increases by $2,500.

a. Illustrate the various combinations of style (S) and gas mileage (G) that Brenda could select with her $25,000 budget. Place gas mileage on the horizontal axis.
b. Suppose Brenda's preferences are such that she always receives three times as much satisfaction from an extra unit of styling as she does from gas mileage. What type of car will Brenda choose?
c. Suppose that Brenda's marginal rate of substitution (of gas mileage for styling) was equal to S/4G . What value of each index would she like to have in her car?
d. Suppose that Brenda's marginal rate of substitution (of gas mileage for styling) was equal to 3S/G . What value of each index would she like to have in her car?

12. Julio receives utility from consuming food (F) and clothing (C) as given by the utility function U(F,C) = FC . In addition, the price of food is $2 per unit, the price of clothing is $10 per unit, and Julio's weekly income is $50.

    a. What is Julio's marginal rate of substitution of food for clothing when utility is maximized? Explain.
    b. Suppose instead that Julio is consuming a bundle with more food and less clothing than his utility maximizing bundle. Would his marginal rate of substitution of food for clothing be greater than or less than your answer in part a? Explain.

13. Orange juice and apple juice are known to be perfect substitutes. Draw the appropriate price-consumption (for a variable price of orange juice) and income consumption curves.
14. Left shoes and right shoes are perfect complements. Draw the appropriate price consumption and income-consumption curves.
15. The director of a theatre company in a small college town is considering changing the way he prices tickets. He has hired an economic consulting firm to estimate the demand for tickets. The firm has classified people who go the theatre into two groups and has come up with two demand functions. The demand curves for the general public (Q_{gp}) and students (Q_s) are given below.

$$Q_{gp} = 500 - 5P$$

$$Q_s = 200 - 4P$$

    a. Graph the two demand curves on one graph, with P on the vertical axis and Q on the horizontal axis. If the current price of tickets is $35, identify the quantity demanded by each group.
    b. Find the price elasticity of demand for each group at the current price and quantity.
    c. Is the director maximizing the revenue he collects from ticket sales by charging $35 for each ticket? Explain.
    d. What price should he charge each group if he wants to maximize revenue collected from ticket sales?

16. Suppose the income elasticity of demand for food is 0.5, and the price elasticity of demand is –1.0. Suppose also that Felicia spends $10,000 a year on food, the price of food is $2, and her income is $25,000.
    a. If a sales tax on food were to cause the price of food to increase to $2.50, what would happen to her consumption of food? (Hint: Since a large price change is involved, you should assume that the price elasticity measures an arc elasticity, rather than a point elasticity.)

b. Suppose that she is given a tax rebate of $2,500 to ease the effect of the sales tax. What would her consumption of food be now?
c. Is she better or worse off when given a rebate equal to the sales tax payments? Draw a graph and explain.

17. Suppose you are in charge of a toll bridge that costs essentially nothing to operate. The demand for bridge crossings Q is given by $P = 15 – 0.5\ Q$.
    a. Draw the demand curve for bridge crossings.
    b. How many people would cross the bridge if there were no toll?
    c. What is the loss of consumer surplus associated with a bridge toll of $5?
18. Show that two utility functions given below generate the identical demand functions for goods X and Y:
    a. $U(X, Y) = \log(X) + \log(Y)$
    b. $U(X, Y) = (XY)^{0.5}$