Homework #1 (***answer key***)
ECNS 204 (Snowmester 2020)
Note: I will not be collecting and grading homework assignments. Work through these problems to better prepare of the weekly quizzes, the midterm, and the final.

1.) Many people choose to work "graveyard" shifts, for example midnight to 8 a.m., because the work during those hours usually pays more than the usual "9 to 5" shifts. How does this illustrate the economic postulates? (Silberberg and Ellis 6th ed., Ch. 2, #5)

The four fundamental postulates of behavior are illustrated by the fact the many people choose to work "graveyard shifts." Individuals work graveyard shifts because they receive higher wages than those obtained for 9 to 5 shifts. Individuals work graveyard shifts because individuals are willing to make trade–offs, e.g., greater income for the inconvenience of working at night. The fact that no one works around the clock illustrates the law of diminishing marginal value of work. Beyond some number of hours of work, leisure is more highly valued at the margin than work.

2.) Wages are higher in the Midwest region of the United States than on either coast. For example, a particular job in St. Louis pays, on average, more than the same job in San Francisco of New York. Explain this in terms of the postulates. (Silberberg and Ellis 6th ed., Ch. 2, #6)

. People have preferences. Most people seem to prefer the amenities of the East and West coasts over those in the midwest. Some people are willing to sacrifice income in order to get these amenities.

3.) On Super Bowl Sunday, some corpulent gentlemen hurl themselves at an ovoid of pigskin. For these exertions, they earn more than most people make in a year, even those who provide a vital service, such as nurses, teachers of economics, etc. Does this mean society values football players more than nurses or teachers? (Silberberg and Ellis 6th ed., Ch. 2, #8)
Classic D-W Paradox problem. The salaries paid to football players vs. nurses reflects their MVs, not their TVs. On the margin, one more NFL player is valued more by society than one more nurse. However, the TV of all nurses to society certainly vastly exceeds the TV of all NFL players.

4.) Aron's marginal values of hamburgers and French fries, per week, are as follows:

Quantity	Hamburgers	French fries
1	$10	$6
2	8	5
3	6	4
		etc.

Joe's Eats charges $4 for hamburgers and $1 for fries. Jake's Eats charges $2 and $3, respectively, for the same quality burgers and fries.

a.) Where does Aron eat, assuming he can't buy burgers in one place and fries in the other? How many burgers and fries does he eat per week?

b.) Joe's decides to institute a new pricing policy: 1 burger and 1 order of fries must be purchased together. How much would Aron be willing to tip the waitperson per week in order to be able to buy burgers and fries separately, if he eats at Joe's?
(Silberberg and Ellis 6th ed., Ch. 2, #16)

Aron buys burgers and fries up to the point where the marginal values equal the respective price charged. Accordingly, Aron purchases four burgers and six fries at Joe's or five burgers and four fries at Jake's. Aron eats where his consumer surplus is greatest. At Joe's, Aron gains $12 worth of consumer's surplus benefits from purchasing four burgers at a price of $4 each and $15 worth of consumer's surplus from purchasing six fries at $1 each for a grand total of $27. At Jake's, Aron gains $20 worth of consumer's surplus from purchasing five burgers at $2 each and $6 worth of consumer's surplus from purchasing four fries at $3 each for a grand total of $26. Therefore, Aron eats four burgers and six fries per week at Joe's.

The amount Aron would be willing to tip the waitperson is the difference between the consumer surplus before the new pricing policy and under the old pricing policy. Under the new pricing scheme, we determine the number of burger/fries bundles by combining the marginal values for burgers and fries. Aron will consume bundles of burgers/fries up to where the combined marginal value equals $5, the sum of the burger and fries prices. Aron, therefore, will purchase five burgers and five fries capturing consumer surplus of $25. The difference between

$25 and $27 is $2. Therefore, Aron would be willing to tip the waitperson $2 per week in order to be able to buy burgers and fries separately.

5.) A student spends weekday evening socializing and crams for the Monday morning exam on Sunday night. How do these actions illustrate the behavioral postulates? (Silberberg and Ellis 6th ed., Ch. 2, #18)

The observation that a student spends weekday evenings socializing and Sunday evening cramming for Monday morning exams illustrate the four behavioral postulates. That the student has preferences is illustrated by the fact that the student chooses both to socialize and to cram for exams. The postulate that more is preferred to less and that individuals are willing to make trade–offs is illustrated by the student's choice to socialize every weekday night rather than study for the Monday exam earlier than Sunday. Because the student does not go out socializing every night of the week, in particular Sunday night, indicates that the law of diminishing marginal value for socializing. The marginal value of socializing falls below the marginal value of studying on Sunday night, so the student studies.

6.) The following are demand curves of representative consumers in the Pacific NW for electricity and salmon, in suitable quantity units:

Salmon

P	$18	16	12	10	8	6	4	2
Q	1	2	3	4	5	6	7	8

Electricity

P	$10	9	8	7	6	5	4	3
Q	1	2	3	4	5	6	7	8

Environmentalists want to allow more water to bypass the generators on the Columbia River so as to allow more salmon to reproduce. However, this raises the cost of electricity. Suppose this policy would raise the price of electricity from \$5 to \$7 and lower the price of salmon from \$10 to \$8. Are these consumers better off with this policy? (Silberberg and Ellis 6th ed., Ch. 2, #29)

Calculate total CS = CS_{salmon} + $CS_{electricity}$ under both scenarios and compare.

Original $CS_{salmon + electricity}$
If P_{salmon} = \$10, then Q_{salmon} = 4.
→ CS_{salmon} = (18 – 10) + (16 – 10) + (12 – 10) + (10 – 10) = \$16

If $P_{electricity}$ = \$5, then $Q_{electricty}$ = 6
→ $CS_{electricity}$ = (10 – 5) + (9 – 5) + (8 – 5) + (7 – 5) + (6 – 5) + (5 – 5) = \$15

Total CS = \$31

New $CS_{salmon + electricity}$
If P_{salmon} = \$8, then Q_{salmon} = 5.
→ CS_{salmon} = (18 – 8) + (16 – 8) + (12 – 8) + (10 – 8) + (8 – 8) = \$24

If $P_{electricity}$ = \$7, then $Q_{electricty}$ = 4
→ $CS_{electricity}$ = (10 – 7) + (9 – 7) + (8 – 7) + (7 – 7) = \$6

Total CS = \$30

Consumers are not better off with this policy.

7.) Chris and Pat are identical twins, but Chris is clean and neat while Pat is a slob. They have the same tastes, being identical twins, and their Marginal Values of hamburgers, in terms of hamburgers consumed per month are as follows:

Q	1	2	3	4	5	6	7
MV	\$12	\$10	\$8	\$5	\$3	\$1	\$0

Because Pat is a slob, the only hamburger proprietor in town charges Pat \$8 for hamburgers instead of \$3, which the proprietor charges everyone else. How much would it benefit Pat per month to clean up? (Silberberg and Ellis 6th ed., Ch. 2, #32)
If P = \$8, Pat chooses Q = 3 and CS = \$6
If P = \$3, Pat chooses Q = 5 and CS = \$23
Thus, Pat would be WTP up to \$17 to clean up.

8.) The Gallatin National Forest in SW Montana is considering closing the road up Hyalite Canyon during the winter months. This road provides access to one of the premier ice climbing venues in the United States. If the road is closed, then those without snowmobiles will be unable to ice climb at Hyalite. Consider Seth, an avid Hyalite climber who does not own a snowmobile.

On average, it costs Seth $30/day to climb at Hyalite (assume this includes all costs, i.e. forgone wages, gas, etc.). Seth's MV schedule for days of ice climbing this season is as follows:

# of days	MV
1	250
2	200
3	175
4	150
5	120
6	100
7	80
8	70
9	50
10	30
11	10
12	0

a.) If the road remains open, how many days would Seth climb this season? What would his total expenditures be?

*He will climb up to the point where P = MV…or 10 days. His total expenditures will be $30*10 = $300.*

b.) Now assume that the Forest Service closes the road. Seth can no longer go ice climbing. What is Seth's loss?

This is a question about CS. At 10 days of ice climbing, we know his TV = $1,225 and his TE = $300. So, the max Seth would be WTP to have the road reopened would be equivalent to CS = TV - TE = $1,225 - $300 = $925

9.) On a recent trip to Bozeman, Penny stopped off at Dave's Sushi for lunch because she heard that the average quality of the King salmon sushi rolls served at Dave's was higher than that of most restaurants in the Pacific Northwest. She found this rumor to be quite peculiar seeing that King salmon do not live in Montana. However, after eating at Dave's Penny agreed that the quality of salmon was higher than that of most Seattle restaurants she had previously eaten at. Give an economic explanation for this observation that is supported by a simple numerical example.

Shipping the Good Apples Out problem.

Suppose we have two types of sushi: High Quality (HQ) and Low Quality (LQ).

Let's also suppose the price of HQ sushi is $12/roll and the price of LQ sushi is $6/roll.

In Seattle, the relative cost of buying one HQ sushi roll is forgoing the opportunity to buy two LQ sushi rolls (b/c $12/$6 = 2).

However, if you are Dave's sushi and you are having your salmon shipped to you from Seattle, then you must incur a shipping cost. Let's say the shipping price for salmon is equivalent to $3/roll. Now, we see that this decreases the relative cost of buying HQ sushi from the perspective

of Dave's. The relative cost of buying one HQ sushi roll is forgoing the opportunity to buy 1.67 LQ sushi rolls (b/c $15/$9 = 1.67). As a result, the proportion of HQ sushi to LQ sushi at Dave's will be higher than in places like Seattle where no fixed shipping cost is incurred.

10.) The elasticity of demand for coffee is estimated to be -0.16. If the quantity demanded was 4 billion lbs. per year when the price is $3.60 per lb., how much coffee would be demanded at $2.40 per lb.? Make sure to show your work. No work, no points. (Silberberg and Ellis 6th ed., Ch. 3, #19)
This is a 33 percent price decrease. Let x = percent increase in coffee consumption. Assuming the elasticity does not change in this price range, -0.16 = -x/.33. Thus, x = .0528. The increase in coffee consumption is therefore (-.0528)(4 billion) = 211,200,000. Coffee consumption becomes 4,211,200,000 lbs.

11.) a.) The elasticity of demand for 16 centimeter-in-length Black Diamond ice screws is -1.5. If the quantity demanded is 5,000 ice screws per year when the price is $60 per ice screw, then how much would the price per ice screw be if the quantity demanded was 7,500 ice screws per year?
Recall, our formula for elasticity of demand

$\varepsilon = \%\Delta Q/\%\Delta P$

→ $-1.5 = [(7{,}500 - 5{,}000)/5{,}000]/(\Delta P/60)$
→ $-1.5 = (2{,}500/5{,}000)*(60/\Delta P)$
→ $\Delta P = (0.5*60)/-1.5$
→ $\Delta P = -\$20$
→ $P = \$40$ per ice screw

b.) Are generic 16 centimeter-in-length ice screws more elastic or more inelastic than 16 centimeter-in-length Black Diamond ice screws?
Less substitutes available for generic ice screws...so, generic ice screws would have a more inelastic demand.

12.) Aron spends his entire income on hamburgers and pizza. His demand for hamburgers is inelastic. If the price of hamburgers increases, what happens to the amount of pizzas he buys? When there are only two goods, can you state a rule about the effect of a change in the price of one good on the amount of the other good purchased? (Hint: You must consider the elasticity of demand of the good whose price has changed.) (Silberberg and Ellis 6th ed., Ch. 3, #25).
Since his demand is inelastic, when the price of hamburgers increases, Aron spends more on hamburgers than previously. Since his income hasn't changed, he buys fewer pizzas. With only two goods, if the price of a good with inelastic demand changes, the quantity of the other good consumed moves in the opposite direction of the price change. The opposite is true if the demand is elastic.