Problem Set 1

Jamal has a flexible summer job. He can work every day but is allowed to take a day off anytime he wants. His friend Don suggests they go to the amusement park on Tuesday. The admission charge for the park is $15 per person, and it will cost them $5 each for gasoline and parking. Jamal loves amusement parks and a day at the park is worth $45 to him. However, Jamal also enjoys his job so much that he would actually be willing to pay $10 per day to do it.

a. If Jamal earns $10 if he works, should he go to the amusement park?

b. If Jamal earns $15 . . . ?

c. If Jamal earns $20 . . . ?

a) Cost of amusement Park Visit = parking + guide
= 15 + 5
= 20

Opportunity Cost of not working = work value + wage
= 10 + 10
= 20

Benefit = 45
Total cost = 20 + 20 = 40

Benefit > cost ✓ ⇒ He should go to the park.

b) Cost of amusement Park = 20

Opportunity Cost of not working = work value + wage
= 10 + 15
= 25

Benefit = 45
Total Cost = 20 + 25 = 45

Benefit > Cost X ⇒ He should not go to the park.

c) Cost of Amusement Park Visit = 20

Opportunity Cost of not working = work value + wage
= 10 + 20
= 30

Benefit = 45
Total Cost = 20 + 30 = 50

Benefit > Cost X ⇒ He should not go to the park.

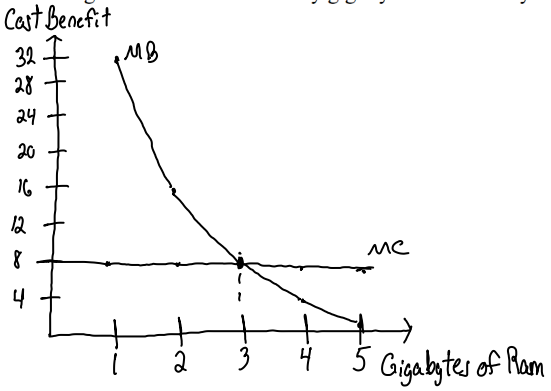
The meal plan at University A lets students eat as much as they like for a fixed fee of $500 per semester. The average student there eats 250 lbs. of food per semester. University B charges students $500 for a book of meal tickets that entitles the student to eat 250 lbs. of food per semester. If the student eats more than 250 lbs., he or she pays extra; if the student eats less, he or she gets a refund. If students are rational, at which university will average food consumption be higher?

If students are rational, average food consumption should be higher at University A. With University A, rational students would tend to eat more than average because there's no additional cost for extra food. Rational students at University B may try to eat more food to avoid additional costs.

Suppose that random access memory (RAM) can be added to your computer at a cost of $8 per gigabyte. Suppose also that the value to you, measured in terms of your willingness to pay, of an additional gigabyte of memory is $32 for the first gigabyte, and then falls by one-half for each additional gigabyte. Draw a graph of marginal cost and marginal benefit. How many gigabytes of memory should you purchase?

G	MB	MC	MB > MC
1	32	8	32 > 8 ✓
2	16	8	16 > 8 ✓
3	8	8	8 > 8 ✓
4	4	8	4 > 8 X
5	2	8	2 > 8 X

Should buy 3 gigabytes of memory.



Practice Question in Python Tutorial 1

Non-linear demand and supply

$$p = i_d(q) := d_0 - d_1 q^{0.6}$$

$$p = i_s(q) := s_0 + s_1 q^{1.8}$$

Paste your code, plot the supply and demand model, and find the equilibrium quantity and price.