Discussion handout 9
EE320 Semester 1/2017

Question 1: Quasi linear preference: Interior v.s. Corner solution.

Dave has a quasilinear preference given by $u(x,y) = a * ln(x) + by,$ where both a and b are ***strictly*** positive. Suppose that price of good x and price of good y are Px and Py, respectively. Consider the following problems.

1.1) Given M is the income that Dave has on his hand, derive the expression for the budget set equation.
1.2) Derive the demand for good x and demand for good y using the Marshallian concept.
1.3) Confirm your result with the second order condition.
1.4) What restrictions do we need to impose on the value of parameters so that demand for both goods are strictly positive.
1.5) What would happen if the condition stated in (1.4) is violated. What type of solution do we have? Then, properly state out the functional form of the demand for good x and good y.

Question 2: Long-run v.s. Short-run cost function

Consider a firm with production technology given by $Q = \sqrt{KL}$ where K is the amount of capital and L is the amount of labor. Suppose that "w" is the wage, and "r" is the rental cost for capital. Consider the following problem.
2.1) Does the production function exhibit a return to scale? What type of return to scale does it exhibit?
2.2) In the short-run where K is fixed to 5 units, derive the short-run cost function.
2.3) Now consider the long-run problem when both K and L can be varied, derive the long-run cost function.