Problem set 6

ECN594:2017

(Inequality constrained optimization)

1. An agent allocates H hours of time available to her between labor (l) and leisure $(H - l)$. Her only source of income is from wages she obtains by working. She earns w per hour of labor; thus, if she works $l \in [0, H]$ hours, her total income is w_l. She spends her income in food (f) and entertainment (e), which cost p and q per unit respectively. Her utility function is given by u(f, e, l) and is increasing in f and e, and is decreasing in l.

   (a) Describe the consumer's utility maximization problem.

   (b) Assuming H=16, w=3,and p=q=1,find the utility maximizing consumption bundle if $u(f, e, l) = f^{1/3}e^{1/3} - l^2$.

2. Solve the following consumer problem: Let the utility function be $u(x_1, x_2) = 3x_1 + x_2$ and the prices p_1 and p_2 for goods are strictly positive. The income is equal to I and the consumption is nonnegative. Find the optimal consumption bundles.

3. Solve exercises 2, 8, 12 of Sundaram, Chapter 6.