EC 501: Problem Set 2
(Due in class on Tuesday, September 17)

1. "Jack Sprat will eat no fat; his wife will eat no lean." Suppose "lean" and "fat" are the only two goods Jack and his wife consume. Find their (separate) utility functions and draw their indifference maps.

2. Jill consumes only three goods, whose quantities are represented by X_1, X_2 and X_3. Her utility function is

$$U(X_1, X_2, X_3) = X_1^a X_2^b X_3^c$$

(i) Derive, from first principles, her demand functions for all three commodities.
(ii) Suppose a=5, b=3, and c=2. What quantities of the three commodities will she consume if P_1 = \$10, P_2 = \$2 and P_3 = \$4 and her income is \$100?

3. Adam's utility function is $U = B^{1/2} A^{1/2}$ where B, A represent the number of bananas and apples respectively that he consumes.

(a) Write down Adam's demand functions for A and B. If his income is \$120 and P_A = \$8 and P_B = \$9, how much A and B will he buy?

(b) Suppose a rationing scheme is introduced. Adam is given 38 ration coupons. The ration coupon "prices" of A and B are set at 3 and 2 coupons respectively. **Adam continues to have to pay the money prices also**. (*In other words, to buy one unit of A he must pay \$8* ***and*** *3 coupons.)* How much A and B will he now buy?

(c) Suppose the ration coupon "prices" had been 6 for apples and 3 for bananas, and Adam's allocation was 48 coupons. What would be his consumption?

(d) Finally, suppose a black market for coupons develops and the black market price of a coupon is \$1. Assuming his coupon allocation is as in (c), how much A and B will Adam buy, and how many coupons will he buy or sell?