Homework 1
due on Thursday Nov 15

Problem 1: Let Germany have a labor force of 80 and France of 60. Suppose both countries produce wine and cars according to the following unit labor requirements:

	Germany	France
wine	$a_w^G = 2$	$a_w^F = 1$
cars	$a_c^G = 8$	$a_c^F = 10$

Further suppose that the representative German as well as the representative Frenchman both have the utility function $U^i(Q_w^i, Q_c^i) = Q_w^i Q_c^i$ where $i = G, F$.

a) Depict the PPF for both countries and label the intercepts as well as the slope (include their exact values, pls). Which country has the comparative advantage in producing wine/cars?

b) Suppose each country wanted to go it alone. What would be the quantities produced (= consumed) and the utility levels obtained under autarky? (A little help: recall from micro that in the consumption optimum $MRS = U_{Qc}/U_{Qw} = p_c/p_w$.)

c) Now consider free trade. Depict the world's relative supply function (again, pls label and provide numbers). What is the world's free trade equilibrium relative price? What quantities does each country produce, how much do they import/export? What are the utility levels obtained? How high are their respective wages?

d) Consider a third country: Spain, which has a labor force of 45 and unit labor requirements $a_w^S = 1$ and $a_c^S = 15$. Repeat c) for all three countries. Does Spain gain from trade? What about the other two?

Problem 2: Suppose that the production functions of sector 1 and 2 are $Q_1 = K_1^{0.3} L_1^{0.7}$ and $Q_2 = K_2^{0.6} L_2^{0.4}$, respectively.

a) Determine formally which of the two goods is capital intensive, that is, uses the higher captial/labor ratio for a given relative factor price.

b) Derive the corresponding unit cost functions and explain why unit costs equal output prices. Then use these equalities to express factor prices as functions of output prices.

c) Using your results from b), explain factor price equalization and verify the Stolper-Samuelson result.

Problem 3: A country's output vector is $X = (2, 2, 1)$, the world's output vector is $X^w = (55, 100, 110)$, the price vector is $p = (4, 4, 3)$, and the commonly used input output coefficients are

$$\begin{pmatrix} 1 & 2 & 1 \\ 1 & 1 & 1 \\ 2 & 1 & 1 \end{pmatrix}$$

where the first row describes labor coefficients, the second row describes land coefficients, and the third row describes capital coefficients. All countries have identical homothetic preferences and balanced trade.

a) Describe the country's pattern of commodity trade.

b) Describe its pattern of trade in factor content.

c) What are the equilibrium factor prices?

Problem 4: Carry out the empirical exercises that you find at the end of chapter 2 in the Feenstra book. You can download the data and stata do files at this URL:
www.econ.ucdavis.edu/faculty/fzfeens/empirical/Chapter-2.zip