Decisions under uncertainty
Problem Set #1, Due April 8, 2003

Some ground rules for problem sets and exams:

Write your homework answers on the sheets supplied. If necessary, you can get new sheets on the class web site.

All homework and examination items are answered with a limitation on space. Limitations on the homework items are typical of those on examination items. Ordinarily, one-half page is allowed. Sometimes a word limit is also set. Write the best answer that you can in the space available. Writing that is illegible or unreasonably tiny is penalized.

In many cases you will know more than can fit in the space. You must decide which parts are most important to write down. In preparing homeworks or examinations, it is usually best not to leave blank space. Instead, explain the answer a bit more deeply.

You should outline the answer for yourself before writing it out for us, whether on homeworks or examinations. It also helps to connect the text to the diagrams and equations, which you do by labeling points in the diagrams (for instance by A, B, C, ...) or labeling equations (for instance, *, **, ***, ...) and then referring to the labels at the proper point in the text. For instance, you might write, "From the initial equilibrium of supply and demand, point A in the figure, the increase in demand leads to a new equilibrium at point B." You should practice this technique in the homeworks and in your preparation for examinations.

1. (Like 1.1 of the text) A lunch menu contains exactly two items: meat and fish. The meat can be either good or poor, and so can the fish. The diner has a modest appetite and chooses one dish or the other. List the exclusive, exhaustive events $\theta_i$ and the decisions $d_j$.

On further thought, the diner might also go elsewhere for lunch. Moreover, he or she might think about dinner, which could be again, either meat or fish. Make a new listing of events (there are eight) and decisions (three), reflecting the new considerations.

Suppose the diner never under any circumstances chooses fish for lunch. The event space can be reduced to essentially four events: What are they?
2. Consider the let’s-make-a-deal game discussed in class. What are the events (three of them)?

What are the decisions (six of them)?

Explain fairly carefully why the contestant is best advised to switch.

3. A salesperson is selecting a car to be used during the next three years. In that time, the price of gasoline may be high, medium or low, and the salesman’s job may require much or little travel by car. Moreover, the salesperson may choose to live near the office, to which he or she must go every day, or far from it. The available cars are the Hummer, the Ford Explorer, and the Nissan Sentra. What are the events and what are the decisions? Explain why you treated residential location as you did.