Problems to be handed in:

1) Do the first of the interactive exercises above exercise 17 in Unit B1 of *CyberStats* entitled “Probability Concepts”.

This entails starting the “The Let’s Make a Deal Applet” and play the game 50 times using each of the two strategies (that is, swap or do not swap the initial door). Write down the success proportions for each strategy for use in the next question.

**Solution (10):** This entails clicking on the doors 50 times for each strategy.

2) Do the second of the interactive exercises above exercise 17 in Unit B1 of *CyberStats* entitled “Probability Concepts”. It is the “Theoretical Probability” interactive, and involves a probability tree at the end of the page.

To do this, first read through the page to get a sense of how probability tables are relevant here.

Using the data collected in the first question, fill in the table entries for the “stay” strategy and click the “Compute!” button. The data you collected from the first interactive for the stay strategy fills the upper-left and lower-right cells (the other cells are zero). From the probability table, what are your probabilities of “Pick prize” and what is the probability of “Open Prize door”?

Fill in the table entries for the “swap” strategy and click the “Compute!” button. The data you collected from the first interactive for the swap strategy fills the bottom-left and upper-right cells (the other cells are zero). From the probability table, what are your probabilities of “Pick prize” and what is the probability of “Open Prize door”?

**Solution (10):** See the solution to the next question for what to do.

3) Submit electronically your answers to the above two questions as part of your answer to exercise 17 Unit B1 of *CyberStats* entitled “Probability Concepts”

**Solution (10):** The question asks what is the best strategy to win the game?

Your answers will depend on the chance involved in your results. In the first interactive I selected number 1 and did not switch, and I won 17 out of 50 games. So I picked the prize door 17 times and open the prize door 17 times. I also picked the donkey door 37 times and open the donkey door 37 times. Both of these are because I did not switch. In the second interactive I entered the results into the table and here is what my results looked like:
So my probability of picking the prize was 0.3148, or about 1 in 3, and my probability of opening the door prize is 0.3148, also about 1 in 3.

In the first interactive I selected number 1, switched to either 2 or 3, and won 32 out of a 50 games. So I picked the prize door 18 times and opened the prize door 32 times. I also picked the donkey door 32 times and opened the donkey door 18 times. Both of these are because I switched each time. In the second interactive I entered the results into the table and here is what my results looked like:

So my probability of picking the prize was 0.36, or about 1 in 3, and my probability of opening the door prize is 0.64, or about 2 in 3.
Based on these numbers, the best strategy is to switch. By switching, the player will only lose in those games where the original guess contained the prize and will win in the remaining $2/3$ of the games. Note that in both cases, the probability of picking the prize door initially is $1/3$. 

$\square$