

STATISTICS 251
HOMEWORK ASSIGNMENT 3 BONUS PROBLEM
DUE FRIDAY OCTOBER 13

Monty Hall's Second Problem: This game is played with 6 cards: 3 Kings and 3 Queens (the particular suits don't matter). On the top side of each card is a number, ranging from 1 to 6; each number 1,2,3,4,5,6 is used exactly once. Monty knows the "code", that is, for each number j he knows whether the other side of the card with top side j is a King or a Queen. The audience members do not know the code, however, and they can only see the numbers on the top sides, so they have no way of knowing which cards are the Queens and which are the Kings.

The cards are to be arranged on two shelves, with 3 cards on each shelf; the player (the audience member selected by Monty to play the game – often the one dressed as a giant chicken) will win \$1000 if the final arrangement of the cards has either 3 Kings or 3 Queens on the top shelf. The player initially arranges the six cards in some fashion, seeing only the numbers on the top sides. Monty then looks at the 3 numbers showing on the top shelf, and then chooses two of the cards so that either both are Kings or both are Queens (keep in mind that Monty knows the code, so he can always "see" two matching cards on the top shelf). He then turns these two cards over, revealing their type (Kings or Queens) to the audience. He then asks the player: "Would you like to stay with your third (still hidden) card, or would you like to exchange it for one of the cards on the bottom shelf?"

What should the player do? Explain your answer.