STAT/MA 41600
In-Class Problem Set #5: September 4, 2015

1. According to cars.com, the percentages of cars sold are given in the second row of the following table, and a risk score for each color is given in the third row, using data from a 2007 report at Monash University by S. Newstead and A. D'Elia.

color:	white	black	silver	gray	red	blue	brown	yellow	green	other
% of cars:	23%	18%	16%	13%	10%	9%	5%	3%	2%	1%
risk rating	1	1.06	1.10	1.10	1.08	1.05	1.03	0.99	1	1%

If a car is picked at random according to the percentages above, and its risk rating is found to be higher than 1.07, what is the conditional probability that:

1a. it is a silver car?

1b. it is a gray car?

1c. it is a red car?

2. The genres of the songs on a student's iPod are: 15% country music, 21% pop, 24% R&B, and 40% rock. Suppose that 90% of the country music songs have a fiddle, 18% of the pop songs have a fiddle, none of the R&B songs have a fiddle, and 10% of the rock songs have a fiddle. If a song is randomly selected from the iPod, and it happens to have fiddle music in the song, what is the conditional probability that it is a country song?

3. Roll a 4-sided die and a 6-sided die. Given that the 4-sided die has a result of 1, 2, or 3 (but not 4), find the conditional probability that the sum of the two dice is 5 or larger.

4. Suppose that a drawer contains 8 marbles: 2 are red, 2 are blue, 2 are green, and 2 are yellow. The marbles are rolling around in a drawer, so that all possibilities are equally likely when they are drawn. Alice chooses 2 marbles without replacement, and then Bob chooses 2 marbles. Let A denote the event that Alice's 2 marbles have a matching color. Let B denote the event that Bob's 2 marbles have a matching color.

4a. Find $P(A \mid B^c)$, i.e., given that Bob's marbles *did not have* a matching color, find the probability that Alice's marbles had a matching color.

4b. Find $P(A^c \mid B^c)$, i.e., given that Bob's marbles *did not have* have a matching color, find the probability that Alice's marbles did not have a matching color.