AMS 102: HOMEWORK 2

SOLUTIONS

Chapter 3

3.19. (a) The response variable is durability.

(b) The explanatory variables are the color of dye *and* the type of cloth.

(c) 4 colors $\times$ 5 cloth types = 20 treatment combinations.

(d) 20 treatments $\times$ 6 specimens for each treatment = 120 total specimens.

3.41. (a) The factors are temperature and baking times.

(b) The response variable is taste.

(c) There are three possible levels of temperature and two possible baking times. Total number of treatmens $= 3 \cdot 2 = 6$.

(d) 6 treatments $\times$ 6 batches of dough for each = 36 units total.

Chapter 4

4.14. (a) Total number of claims: $360 + 20 + 60 + 840 + 580 + 940 = 2800$. Total number of fraudulent claims: $360 + 20 + 60 = 440$. Proportion of fraudulent claims: $440/2800 \approx 0.157 = 15.7\%$.

(b) The conditional distribution of fraudulent claims given the type of policy.

(c) Total number of fire policies: $360 + 840 = 1200$. Of these, fraudulent $360/1200 = 0.3 = 30\%$.

Total number of auto policies: $20 + 580 = 600$. Of these, fraudulent $20/600 \approx 0.033 = 3.3\%$.

Total number of other policies: $60 + 940 = 1000$. Of these, fraudulent $60/1000 = 0.06 = 6\%$.

	Type of Policy		
	Fire	Auto	Other
Fraudulent	30%	3.3%	6%
Nonfraudulent	70%	92.7%	94%

4.33. (a) Skewed to the right.

(b) 5 customers out of $5 + 6 + 10 + 5 + 3 + 1 + 1 = 31$ (total number of customers). This is $5/31 \approx 0.16 = 16\%$.

(c) Five minutes or longer = 300 seconds or longer. One customer spent 300-350 seconds, one more 350-400 seconds. Total number: 2.

(d) The largest time spent was between 350 and 400 seconds. We can't be more precise (i.e. have the exact time).

4.58. (a) Qualitative. (Possible values: Single, married, widowed.)

(b) Quantitative, continuous. (Can be any real number.)

(c) Quantitative, discrete. (An integer.)

(d) Quantitative, continuous. (Can be any length of time, even fractional.)

(e) Quantitative, discrete. (An integer.)

4.63. (d) The conditional distribution of blood type given Rh factor.

(Each row sums up to 100%. Thus we have a conditional distribution of the column variable given the row variable.)