Practice Set 9 Discrete Probability Distributions

I. Darin sells three different Walkman CD recorders; one for $149, one for $159, and a third for $169. Of the 187 machines sold during a recent period, 43 were the least expensive, 90 were moderately priced, and 54 were the expensive model.

A. Calculate the expected price of Walkman CD recorders.

Sales Price (x)	Number of Sales	Probability P(x)	$x \bullet P(x)$
$149	43	43/187 = .230	$34.27
159	90	90/187 = .481	76.48
169	54	54/187 = .289	48.84
	187	1.00	$159.59

B. Compare this answer to the page 12 weighted mean sales value of Walkman sales.

The answers are the same.

C. In theory, what is the difference between a weighted mean of variable x and the expected value of x?

A weighted mean concerns existing data and the expected value of x concerns data that could exist.

II. When waiting on a customer, Darin's salespeople make a sale 60% of the time (see page 42). Use the binomial formula to calculate the probability of making exactly 3 sales to 5 customers.

Given

p = .6

q = 1 - p = .4

n = 5

x = 3

$$P(x) = \frac{n!}{x!(n-x)!} p^x q^{n-x}$$

$$P(3) = \frac{5!}{3!(5-3)!} .6^3 .4^{5-3}$$

$$= \frac{5 \times 4 \times 3 \times 2 \times 1}{3 \times 2 \times 1 \times 2 \times 1} \times .216 \times .16$$

$$= 10 \times .03456 = .3456 \text{ or } 34.6\%$$

III. Using the appropriate table, complete the binomial distribution described by question II.

Binomial Probability Distribution n = 5, p = .6 and q = 1 - p = .4	
# of sales (x)	P(x)
0	.010
1	.077
2	.230
3	.346
4	.259
5	.078
Total	1.000

Note: Lulu thought a graph of this distribution might prove interesting.