Assignment 10 ST 216

Due Friday, November 14, 2014

Problem	Page
45	252
48	253

1. A product manager looks over the performances of 40 workers on any given day to see the number of items each worker produces in the morning and in the afternoon. Let X and Y represent the number of items produced in the morning and in the afternoon, respectively. He summarizes his results in a table below.

	Y		
X	***2***	***3***	***5***
1	8	4	2
3	10	8	4
4	3	0	1

   1.1 Construct a two-way table showing the joint probability distribution of (X,Y)
   1.2 Find the marginal probability distribution of X.
   1.3 Are X and Y independent random variables? Cite evidence.
   1.4 Find E(XY).
   1.5 Find Cov(X,Y).
   1.6 Find $P(X \geq 1 | Y < 3)$
   1.7 Find E(X) and E(Y). Are E(XY) and E(X)E(Y) equal?
   1.8 Find conditional probability distribution of Y given X = 3.
   1.9 Find E(Y|X=4)
   1.10 Find E(X+Y) and Var(X+Y)

2. A researcher is studying number of times 80 male students and 100 female students visited library last semester. The marginal probability distributions of the number of times each student visited library last semester are shown in the accompanying table.

Number of times male students visited library (X)	Probability	Number of times female students visited library (Y)	Probability
0	.05	0	.18
1	.35	1	.12
2	.45	2	.60
3	.15	3	.10

If the number of times male and female students visited library are independent.

2.1 Construct two-way table showing the joint probability distribution of the number of times male and female students visited library.
2.2 Find the mean and standard deviation of the total number of times students visited library.
2.3 Find E(XY)
2.4 Find P(Y=2|X=3)
2.5 Find P(Y=2)
2.6 Compare the results in (2.4) and (2.5). Comment on what you have found.