Bent E. Sørensen

ECONOMICS 6331 – Probability and Statistics, Fall 2004

Homework 6. Wednesday October 20. Due Monday October 25.

1. (32% of Midterm 2, Fall 2003) Consider two random variables X and Y. Assume they both are discrete and that both X and Y can take the values 1,2, and 3. The probabilities for (X,Y) are shown in the following table:

	X=1	X=2	X=3
Y=1	2/24	3/24	7/24
Y=2	1/24	3/24	2/24
Y=3	1/24	2/24	3/24

i) Find the marginal probabilities of X and Y. Mark clearly which are the marginal probabilities of X and which are the marginal probabilities of Y. Explain what the marginal probabilities measure.
ii) Find the mean and the variance of Y.
iii) Are the events $X = 1$ and $Y = 1$ independent events?
iv) Are the random variables X and Y independent?
v) Find the probability $P(\{X > 2\} \bigcap \{Y \leq 2\})$
vi) Find the conditional distribution of X given $Y = 2$.
vii) Find the random variable $E(X|Y)$.
viii) Find $Var(X|Y = 2)$.

2. Ramanathan, Exercise 5.1, page 117.