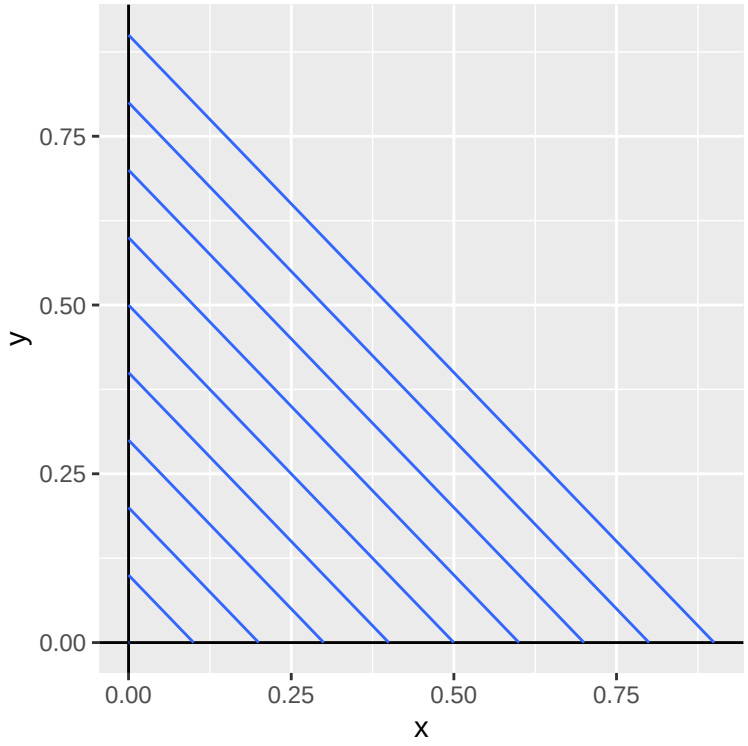
STAT 2857A – Lecture 23a Examples and Exercises

Suppose that X and Y are random variables with joint pdf:

$$f(x,y) = c(1-(x+y)), \quad 0 < x < 1, 0 < y < 1, x + y < 1.$$

The contours of the pdf look like this:



a) Find the value of c.
b) Find the marginal pdf of X and Y.

c) Find the conditional pdf of $X|Y = y$.

d) Find the conditional mean and variance of $X|Y = y$.

e) It can be shown that

$$E(X) = E(Y) = 1/4$$

and

$$V(X) = V(Y) = 3/80.$$

What are the covariance and correlation of X and Y?