Econ 7710
Assignment 2

The due date for this assignment is Friday September 22nd.

1. Let X and Y be independent random variables with distribution functions $F(\cdot)$ and $G(\cdot)$ accordingly. Find distribution functions of the following random variables
   (a) $\max\{X, Y\}$
   (b) $\min\{X, Y\}$
   (c) $\max\{2X, Y\}$
   (d) $\min\{X^3, Y\}$
2. Suppose the joint cumulative distribution function (cdf) of (X, Y) on the unit square is $\frac{1}{2}(xy + \min\{x, y\})$.
   (a) How does the cdf behave outside the unit square?
   (b) What are the marginal cdf's of X and Y?
   (c) What is the cdf of (U, V), where $U = \log X$ and $V = \log Y$?
   (d) Does the joint distribution of X, Y have a density w.r.t Lebesgue measure? Why or why not? What about the marginal distributions of X and Y? Of U and V? A distribution does not have a density with respect to (w.r.t.) the Lebesgue measure if it places positive probability on a set that has Lebesgue measure zero.
   (e) Find conditional expectations of Y given X, U given V, and V given U.