Probability and Stochastic Processes (EL6303), Section I September 5, 2018
NYU Tandon School of Engineering, Fall 2018
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Diagnostic Quiz

1. If $A \subset B$, then state whether the following are true or false. Explain.

   (a) $P(B|A^c) = 0$.

   (b) $P(A|B^c) = 0$.

   (c) $P(B|A) = 1$.

   (d) $P(A) > P(A \cap B)$.

   (e) $P(A) = P(B)$.

2. In the lab you have phones coming from two vendors S and N. Probability that a phone coming from vendor S is faulty is 0.1, from vendor N is 0.2.

   (a) If you have an equal number of phones from vendors S and N, what is the probability that a randomly chosen phone is faulty?

   (b) If you would like to have the probability of a randomly chosen phone being faulty no more than 0.11, what is the smallest proportion of phones you need to buy from vendor S?

3. (a) What does it mean for two random variables X and Y to be independent? Explain.

   (b) What does it mean for two random variables X and Y to be uncorrelated? Explain.

   (c) If X, Y are uncorrelated, are they independent? Explain.

   (d) If X, Y are independent, are they uncorrelated? Explain.