STAT 509 2017 Summer HW1

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Lecture Day: May 8

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1. A local television weatherman announces, There is a 30 percent chance of rain tomorrow. What is your interpretation of this statement?

   (a) It will rain tomorrow for 30 percent of the time. That is, for 7.2 hours tomorrow, it will be raining. For the remaining 16.8 hours, it will not be raining.

   (b) It will rain tomorrow in 30 percent of the region covered by the local television station. It will not rain in the other 70 percent of the region.

   (c) Among all local meteorologists, 30 percent of them think that it will rain tomorrow. The remaining 70 percent of the meteorologists think that it will not rain tomorrow.

   (d) Thirty percent of all inhabitants of the region covered by this local television station will see rain at least once during their day tomorrow; the remaining 70 percent will not see rain during their day.

   (e) It will rain on 30 percent of the days in which this same forecast is made.

   I think (e) is the best interpretation, but in reality all 5 interpretations are valid depending on how you conceptualize the underlying sample space for such a probability assignment; i.e., $P(A) = 0.30$, where A is the event it rains. For each possible interpretation, describe a sample space that would make each interpretation valid.

2. Conduct a simulation with tossing a "biased" 1000 times. In each toss, the probability to get head is 80%. Generate a plot to demonstrate the change of proportion of heads over time using R (similar to the plot in chapter 2 notes page 9). (Hint: `x <- rbinom(n=1000,size=1,prob=0.8)`).