

basic probability

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1. Say your parents paid for your Rutgers education \$100k, was their investment a good one? University education is expected to increase lifetime earnings by .5m. Yet, it is not easy to graduate from Rutgers—only 70% of students finish successfully assuming that they pass a really hard statistics class, and only 10% of students pass statistics class—you cannot continue with your studies if you don't pass statistics. [hint: of course you need to calculate expected value]
2. Say you take 3 classes this semester. Again, it is hard to pass statistics—only 10% of students pass. But it is easy to pass other classes, say 90% pass those—what is the probability you will continue to be a student (pass all three classes)?
3. Say you live in Delaware. The travel time is usually 30 minutes from Camden to your house in Delaware (you live just across the river). But if the weather is bad, the travel time is 45 minutes, and weather is bad in New Jersey 60% of the time. One day per week, there is traffic accident, and then travel time is 2 hours. What is the expected travel time on any given day from Camden to your house in Delaware?
4. Say there are 7 Democrats and 3 females in this class of 10. There are no Independents (a person can be either Republican or Democrat). 2 females are Democrat. Put counts in a table, and calculate the probability that a male is a Republican.
5. Imagine you've landed your dream job as governor of the great state of NJ! As recent history indicates, it is important to plan for disasters! Say that there is a probability of .001 that severe storm like Sandy will hit the state in any given year. Sandy costed \$65 billion. But there is much higher probability that there will be damage due to more moderate weather. Say, on average, every month there is \$100,000 in damage due to weather in the state. What, (and by how much) is more costly to the taxpayer: typical weather damage or severe weather damage?
6. Say that probability that a male commits a crime during the five years of his adolescence (13-18 yo) is .01. The corresponding probability for a female is only .005. Probability increases sharply, five-fold, for both genders if a person's father was jailed during person's childhood. In which group there is more likely to happen a crime? That is, rank order the three groups in terms of probability that someone from the group commits a crime.
 - Group A: 100 adolescent males (no criminal history in family)
 - Group B: 200 adolescent females (no criminal history in family)
 - Group C: 50 adolescent females, whose father was jailed during their childhood

general directions (always the same):

- ps is due in class in hardcopy
- keep it short; max: 5 single spaced pages; typically way less, say 1 or 2
- if you are stuck, email me early! also can email me if you want some feedback and make sure you are on the right track, etc
- show your work, a “naked” number won't do! unless indicated otherwise, always do calculations by hand
- if your handwriting is bad, please type
- i may want to discuss your assignment in class, which should be beneficial to you and give you more feedback; if however, you'd like to keep it private, let me know!
- ideally you want to use this class to write a research part of your capstone
- think if you can engage civically—see section 'civic engagement component' in syllabus