**Week Two: Probability Spaces and Events**

1. If I am in a very good mood when I grade your problem set, and give you a better grade because of that, what heuristic bias I am exhibiting?
2. List all possible outcomes for the following scenarios. Make sure to include ALL elementary individual outcomes that Drawing a tree diagram could be helpful:
   1. You flip two coins at the same time
   2. Whether or not a ballot measure passes to raise the minimum wage in a single district
   3. A response to a survey asking the respondent to rank themselves on a Conservative-Liberal scale (1-7)
   4. A jury of twelve people renders a verdict
3. List the sample space, set of events, and probability measure for the following scenarios. You just have to describe what the probability measure measures, you don’t have to provide specific numbers. You do not need to list each element individually:
   1. You are dealt a five-card hand in poker (google poker hands if you’re not familiar)
   2. An employee takes a drug test
   3. You and friend decide between 10 movies playing in the theater
   4. A jury of twelve people renders a verdict (hint: you listed Ω in the previous question)
   5. Three candidates running for mayor in a single district
   6. Comparing predicted test scores among pupils in private and public schools
   7. 18 congressmen are elected from 18 districts in Pennsylvania
4. Are the following events independent? Give a brief explanation why.
   1. You flip three heads in a row
   2. Somebody you know wins the lottery twice in their lifetime
   3. You get a royal flush in poker and hit a jackpot on the slot machine
   4. Somebody identifies as a “strong conservative” on a survey and votes Republican
   5. Left-wing candidate wins presidential election in Mexico, and right-wing candidate wins election in Brazil
5. If two events are disjoint, what are their marginal probabilities equal to?
6. Draw out the probability space and venn diagrams for the following probabilities:
   1. 41% of Americans identify as Democrats, and 52% of Americans opposed Brett Kavanaugh. 95% of Democrats also opposed Kavanuagh
   2. 93% of Republicans approve of Trump. 35% of Americans identify as Republicans and 41% approve of Trump
   3. 41% of Americans identify as Democrats, 35% identify as Republicans, and 34% identify as Independents
   4. Five candidates are running in a local election. Polls show candidate 1 has a 33% chance of winning, candidate 2 has a 25% chance of winning, candidate 3 has a 22% chance of winning, candidate 4 has a 12% chance of winning, and candidate 5 has an 8% chance of winning.
7. Answer the following questions in Open Intro stats: 2.7; 2.8; 2.11; 2.12; 2.14; 2.17; 2.18; 2.24; 2.26