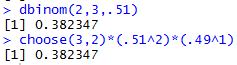
* Heights of 10 year-olds, regardless of gender, closely follow a normal distribution w/ mean 55 inches + SD = 6 inches. Which of the following is true?
* We would expect more 10 year-olds to be shorter than 55 inches than taller = **EQUAL**
* **A normal probability plot of heights of a random sample of 500 10 year-olds people should show a fairly straight line.**
* Roughly 95% of 10 year-olds are between 37 and 73 inches tall = **between 43-67**
* A 10 year-old who is 65 inches tall would be considered more unusual than a 10 year-old who is 45 inches tall = **SAME**
* While it’s often assumed probabilities of having a boy or a girl are the same, actual probability of having a boy is slightly higher at 0.51. Suppose a couple plans to have 3 children. What is the probability that exactly 2 of them will be boys?
* Given: n = 3, k = 2, P(B) = .51



* You’re about to take a multi-day tour through a national park famous for its wildlife. The tour guide tells you that on any given day there’s a 61% chance a visitor will see at least 1 “big game” (moose or bear) animal, + a 39% chance they’ll see no big game animals. The guide assures you big game sightings on a single day are *independent* of any other day’s sightings. Given the info from the tour guide, which of the following calculations CANNOT be performed using a binomial distribution?
* ~~Calculate probability that over a 5-day trip, you see big game on the 1~~~~st~~ ~~day + on every day after.~~
* ~~Calculate probability you see big game exactly 0 days of an 8-day trip.~~
* ~~Calculate probability you see big game on at least 8 days of a 10-day trip.~~
* **Calculate probability you see at least 4 big game animals on the first day of a 5-day trip.**
* Your friend is about to begin an intro chemistry course. The course has collected data from students on their study habits for many years, + the professor reports study times (in hours) for the final closely follow a normal distribution w/ mean 24 + SD 4. What % of students study 34 hours or more?
* **Less than 2.5%**
* Which of the following is false? Hint: It might be useful to sketch the distributions.
* ~~Z scores are defined for observations from distributions of any shape and skew.~~
* **The Z score for the median of a left skewed distribution is most likely negative.**
* ~~Calculating percentiles based on the Z table is only appropriate for observations that come from (nearly) normal distributions.~~
* ~~The Z score for the median of a symmetric distribution is approximately 0.~~
* About 30% of human twins are identical + the rest are fraternal. Identical twins are necessarily the same sex, 1/2 are both males + the other 1/2 are both females. 1/4 of fraternal twins are both male, ¼ quarter both female, and 1/2 are mixes: 1 male, 1 female. You have just become a parent of twins + are told they are both girls. Given this info, what is the probability that they are identical?
* **P(I | FF) = P(I & FF) / P(FF) = (.3\*.5) / ((.3\*.5) + (.7\*.25)) = .4615 = 46%**
* Which of the following probabilities can be calculated using the normal approximation to the binomial distribution?
* ~~Roughly 20% of Americans smoke. What is the probability that in a random sample of 40 people at least 5 are smokers? 🡪 expected~~ = **40\*.2 = 8**
* **A clothing store offers store credit cards + only about 17% of the CC holders are males. If we were to randomly sample 100 store CC holders to conduct a survey, what is the probability that at most 20 of sampled individuals would be males? 🡪 expected S = 100\*.17 = 17, F = 83**
* ~~A September 2011 Gallup poll suggests 56% of Americans do not have a great deal of confidence in the mass media to report the news fully, accurately, and fairly. What is the probability that in a random sample of 20 people, 10+ have confidence in the mass media? 🡪~~ **20\*.44 = 8.8**
* ~~A 2013 Gallup poll reports 8% of Americans say the situation in Syria is the most important issue affecting the U.S. In a randomly selected group of 75 Americans, what is the probability more than 10 believe the situation in Syria is the most important issue facing the U.S.? 🡪~~ **75\*.08 = 6**
* Suppose scores on a national entrance exam are normally distributed W/ mean 1000 + SD 100. Which of the following is false?
* ~~Roughly 68% of people have scores between 900 and 1100.~~
* ~~A normal probability/QQ plot of national entrance exam scores of a random sample of 1,000 people should show a straight line.~~
* ~~A score greater than 1300 is more unusual than a score less than 800.~~
* **We would expect # of people scoring > 1200 to be more than # of people scoring < 900.**
* A 2005 survey found 7% of teenagers (ages 13-17) suffer from arachnophobia. At a summer camp there are 10 teenagers sleeping in each tent. Assume these 10 teenagers are independent of each other. What is the probability that at least 1 of them suffers from arachnophobia?
*  **🡺 52%**
* About 24% of flights departing from NY’s JFK International Airport were delayed in 2009. Assuming the chance of a flight being delayed has stayed constant at 24%, we’re interested in finding probability of 10 out of the next 100 departing flights being delayed. Noting that if 1 flight is delayed, the next flight is more likely to be delayed, which of the following statements is correct?
* **We cannot calculate this probability using the binomial distribution since whether or not one flight is delayed is not independent of another.**
* Which of the following, on its own, is the LEAST useful method for assessing if the data follow a normal distribution?
* ~~Check if 68% of the data are within 1 SD of the mean, 95% of data are within 2 SDs of the mean, and 99.7% of data are within 3 SDs of the mean.~~
* **Check if the mean and median are equal.**
* ~~Check if the points are on a straight line on a normal probability plot.~~
* ~~Check if the distribution is unimodal and symmetric.~~
* Which of the following is true? Hint: It might be useful to sketch the distributions.
* ~~The Z score for the mean is undefined if the distribution is bimodal and skewed.~~
* ~~The Z score for the median will usually be 0 if the distribution is unimodal and right- skewed.~~
* **The Z score for the median is approximately 0 if the distribution is bimodal and symmetric.**
* ~~The Z score for the median is undefined if the distribution is bimodal.~~
* At any given time about 5.5% of women (age 15-45) are pregnant. A home pregnancy test is accurate 99% of the time if a woman taking the test is actually pregnant + 99.5% accurate if the woman is NOT pregnant. If the test yields a positive result, what is the posterior probability of the hypothesis that the woman is pregnant?
* **P(Pr | Pos) = P(Pr & Pos) / P(Pos) = (.055\*.99) / ((.055\*.99) + (.945\*.005)) = 0.920152091= 92%**
* 1 strange phenomenon that sometimes occurs at U.S. airport security gates is that an otherwise law-abiding passenger is caught w/ a gun in their carry-on. Usually the passenger claims they forgot to remove it from a rarely-used bag before packing it for airline travel. It’s estimated that every day 3M gun owners fly on domestic U.S. flights. Suppose the probability a gun owner will mistakenly take a gun to the airport is 0.00001. What is the probability that tomorrow more than 35 domestic passengers will accidentally get caught with a gun at the airport? Choose the closest answer.

 **🡺 0.18**