

Stat 202 Exam 1 Study Guide

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February 9, 2015

1. According to Wikipedia, Paul, the famous octopus from the 2010 World Cup, correctly predicted the result of 7 out of 7 matches, prompting to people to believe that Paul had special powers of prediction. What is the probability that an octopus without special powers will get 7 out of 7 predictions right, assuming that all the predictions are independent, and each winning team has a 50-50 chance (i.e. probability .5) of being selected by the octopus?
2. Given the genetic makeup of hypothetical parents, the probability of bearing a son (versus a daughter) is $1/2$ and the probability of having a child with brown hair is $3/4$. And given this hypothetical mix of parental genes, the only other possible hair color for the child is blonde. Assume the sex and hair color of the child are independent. What is the probability of the parents bearing a child who is a blonde girl?
3. What is the probability of rolling exactly six 6's in 20 rolls of a dice.
4. A bag of dice consists of 10 loaded dice and 20 fair dice. The loaded dice are altered so that the probability of rolling a 1 is 0.2. What is the probability of rolling a 1 with a randomly selected die from the bag?
5. Simulate 200 observations from the t-distribution. For parameter, let DF be 3. Choose a fixed seed of 15. Plot a normal quantile plot with StatCrunch and use link provided on my website for interpretation. How would you describe the t-distribution?
6. SAT scores are approximately Normal with mean 1509 and standard deviation 321. How high do you need to score to fall exactly on the 92nd percentile?
7. SAT scores are approximately Normal with mean 1509 and standard deviation 321. What percentile is a score of 1700?
8. SAT scores are approximately Normal with mean 1509 and standard deviation 321. What is the Z -score corresponding to a raw score of 1700?
9. SAT scores are approximately Normal with mean 1509 and standard deviation 321. What is the raw score corresponding to a Z -score of 1.3?

10. SAT scores are approximately Normal with mean 1509 and standard deviation 321. What proportion of students score between 1700 and 1800?
11. Simulate 500 observations from the standard normal distribution. Use a fixed seed of 20. Report the 5-number summary of the data.