13.3 Simulations

CA #1

Name:_____

For each of the following problems, be sure to clearly explain how you conducted your simulation. Tell which numbers were assigned to each outcome and the results of each of your trials.

1. An NFL kicker makes 70% of his kicks from 40 – 49 yards out. At the end of a playoff game, he misses two kicks in a row from that distance. How frequently will a kicker that makes 70% of his kicks miss two kicks in a row? Run a simulation of at least 20 trials to estimate the answer.

2. The chance of contracting strep Beanatosis (a highly contagious disease) when coming into contact with an infected person is estimated as 0.15. Suppose the four children of a family come into contact with an infected person. Using your results, estimate the average number of children who will get the disease.

3. Sully loves girl scout cookies! The probability that when Mr. Sullivan passes a girl scout he buys a box of cookies is 0.25. If he buys a box, he will not buy another. However, the probability that he buys a box increases to 0.40 for each additional girl scout he passes. Use simulation to find the probability that, if Sully passes 3 girl scouts on the way home from work, he will buy at least one box of cookies.

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Corrective Assignment Answers

Trial results will vary. You need to show the results of each of your trials similar to the results shown in #1.

1. An NFL kicker makes 70% of his kicks from 40 – 49 yards out. At the end of a playoff game, he misses two kicks in a row from that distance. How frequently will a kicker that makes 70% of his kicks miss two kicks in a row? Run a simulation of at least 20 trials to estimate the answer.

Assign the numbers 1-7 to represent a made field goal and 8 -10 to represent a missed field goal. Pull two random numbers at a time. See how many of your trials has both numbers from 8-10 (misses). Seeding your calculator at 50 you get:

Trials 1 – 4	*Trials 5 – 8*	*Trials 9 – 12*	*Trials 13 – 16*	*Trials 17 - 20*
{3 8}	{4 3}	{4 10}	{2 6}	{10 2}
{3 5}	{7 5}	{3 9}	{7 5}	{9 2}
{4 3}	{9 3}	{2 5}	{1 7}	{4 5}
{1 1}	{2 10}	{1 8}	{7 2}	{7 9}

In this simulation, no trial has both numbers from 8 – 10. This represents that he never misses both kicks; we would estimate the probability to be near 0%. In reality, the probability is 0.09% This is why a LARGE number of trials is always ideal and simulations are only considered an estimate.

2. The chance of contacting strep throat when coming into contact with an infected person is estimated as 0.15. Suppose the four children of a family come into contact with an infected person. Using your results, estimate the average number of children who will get the disease.

3. Sully loves girl scout cookies! The probability that when Mr. Sullivan passes a girl scout he buys a box of cookies is 0.25. If he buys a box, he will not buy another. However, the probability that he buys a box increases to 0.40 for each additional girl scout he passes. Use simulation to find the probability that, if Sully passes 3 girl scouts on the way home from work, he will buy at least one box of cookies.