13.3 Simulations

CA #2

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. Megan Rapinoe is a famous soccer star who scores on about 10% of the shots that she takes. Suppose Megan shoots 15 times per game and is scheduled to play in 3 games this week. Use simulation of 20 trials to estimate the probability that Megan will score in all 3 games.

2. The chance of contacting the flu when coming into contact with another infected person is estimated as 0.31. Suppose all 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. Brust loves ice cream! The probability that when Mr. Brust passes an ice cream stand he buys a scoop of ice cream is 46%. If he buys one scoop, he will not buy another. However, the probability that he buys a scoop increases to 58% for each additional ice cream stand he passes. Use simulation to find the probability that, if Brust passes 3 ice cream stands on the way home from work, he will buy at least one scoop of ice cream.

13.3 Simulations

Corrective Assignment Answers

Trial results will vary. You need to show the results of each of your trials similar to the results shown in #3.

1.

Assign the number 1 to represent shot that scores. Assign the number 2-10 to represent a shot that does not score. Select 15 random numbers and examine to see if there are any 0s in the group. Repeat the process 3 times. Count the number of times there was a t least one 0 in each of the three groups. Repeat this process 20 times.

The answer should be close to about 79% of the time.

2.

Assign the numbers 1 to 31 to represent a person was infected. Assign the numbers 32-100 to represent a person was not infected. Select 4 random numbers and examine to record how many were between 1 and 31. Repeat this process 20 times and average the numbers recorded.

The answer should be close to about 1.2 children.

3.

Assign the numbers 1 to 46 to represent Brust buys an ice cream. Assign the numbers 47-100 to represent Brust does NOT buy an ice cream. Pull one number and determine if it is between 1-46 (meaning he bought an ice cream). If the number is NOT between 1-46, you have to select two more numbers with 1-58 meaning he buys an ice cream, and 59-100 meaning he did not buy an ice cream. Example trials (if you seed you calculator to 100) and select 3 random numbers from 1 -100, 20 times:

Trials 1 – 4	*Trials 5 – 8*	*Trials 9 – 12*	*Trials 13 – 16*	*Trials 17 - 20*
{56 60 54}	{77 46 32}	{37 4 37}	{77 91 35}	{36 61 2}
{93 67 50}	{91 67 99}	{82 18 21}	{63 49 18}	{59 84 66}
{1 20 73}	{58 64 23}	{40 21 94}	{44 93 84}	{47 16 39}
{47 29 90}	{85 9 48}	{40 75 27}	{71 68 4}	{51 30 89}

The circled number represents the first ice cream stand Brust purchases an ice cream cone at. If you notice, he buys no ice cream for trials number 6 and 18. We would estimate the likelihood that Brust buys Ice Cream at about 18/20, or 90% of the time.