

Lab #3

February 1, 2012
MATH 141.200

Name: _____

The is due at the start of lab on **February 8**. Don't forget to e-mail me your spreadsheet.

This lab is to examine the probabilities associated with the outcomes when repeating an experiment multiple times.

On my webpage is a link that shows the comands typed into a spreadsheet to simulate rolling a four sided die 20 times.

Note: The commands work for the openoffice spreadsheet. They might have to be adjusted for the Microsoft Excel program. Use a spreadsheet help files for an explanation of the syntax of a command.

Here are some usefull commands for a spreadsheet.

Range refers to a set of cells being referenced. A1:C7 means all of the cells that form the rectangle from A1 down to C7. If you plan on copying a formula and you want the range to stay the same then reference by \$A\$1:\$C\$7

Randbetween(bottom,top) will randomly choose an integer between the bottom and top(inclusive). To regenerate a new random variable press **shift + ctrl + F9**. In excel this command will generate a new random number every time you press enter.

countif(range,criteria) will count all the cells that meet the criteria in the specified range. For example the command **countif(range;"<10")** will count all instances in the range where the number in a cell is less than 10.

sum(range) will add the numbers in the cells in the specified range.

Changing the number of decimal digits: To change the number of decimal digits shown, click on the cell (you want to change) and then click on **Format** and then **Cells**. Select the tab **Numbers**. Find the option "Decimal places" and change it to the desired amount. (usually more than 2 places.)

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The is due at the start of lab on **February 8**

Problem 1: Type your name in the first page of the spreadsheet.

Problem 2: The experiment is to roll an 8 sided die the specified number of times. Give your relative frequency to **at least 4 decimal digits**.

Number of Rolls	20							
Sample Space	1	2	3	4	5	6	7	8
frequency								
relative freq								

Repeat the experiment two more times with 20 rolls.

Number of Rolls	20							
Sample Space	1	2	3	4	5	6	7	8
frequency								
relative freq								

Number of Rolls	20							
Sample Space	1	2	3	4	5	6	7	8
frequency								
relative freq								

Notice that with each repetition of 20 rolls, the probability of the outcomes has the potential to vary greatly.

Now repeat the experiment the number of times as requested in the table.

Number of Rolls	500							
Sample Space	1	2	3	4	5	6	7	8
frequency								
relative freq								

Problem 3: Simulate the following experiment on the second page of the spreadsheet.

A box contains 9 yellow balls and 4 green balls. The experiment is to draw a ball from the box and write down the color drawn. The ball is then replaced into the box. Repeat the experiment the number of times as indicated in the tables. Hint: Think about numbering the balls.

Number of Draws	50	
Sample Space	G	Y
frequency		
relative freq		

Something to think about: Is there any difference simulating a large number of trials at once or in smaller groups? Can you use the answer to this question to make the next part easier?

Number of Draws	300	
Sample Space	G	Y
frequency		
relative freq		

Problem 4: Simulate the following experiment on a different page of the spreadsheet.

A box contains 9 yellow balls and 4 green balls. The experiment is to draw two balls from the box, with the ball being replaced after each draw. The color of both balls are recorded. Repeat the experiment the number of times as indicated in the tables.

Number of Draws	800		
Sample Space	both G	both Y	one of each
frequency			
relative freq			

Are the probabilities of the simulation close to the theoretical probabilities?