

HW 2 – SIMULATIONS

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1. NCSU and UNC baseball teams are playing in a 7 game series. Whichever team wins 4 games wins the series. The NCSU team has a 70% probability of winning, while the UNC team has a 30% probability of winning. Create a simulation and run 10 trials. Determine the sample statistic for NCSU winning the series.

NCSU → 1, 2, 3, 4, 5, 6, 7  
 UNC → 8, 9, 10

RandInt(1, 10, 7)

TRIAL	OUTCOME	NCSU WINS?	TRIAL	OUTCOME	NCSU WINS?
1	10, 10, 2, 6, 5, 8, 1	yes	6		
2	4, 10, 3, 8, 10, 3, 4	yes	7		
3	1, 10, 2, 1, 6, 9, 10	yes	8		
4	8, 4, 3, 10, 10, 9, 1	no	9		
5			10		

2. You are playing a game at the fair where you flip 5 coins in a row. If you get either all heads OR all tails, you win the game. Create a simulation and run 20 trials. Determine the sample statistic for getting all heads or all tails.

heads → 1  
 tails → 2

RandInt(1, 2, 5)

TRIAL	OUTCOME	ALL HEADS OR ALL TAILS?	TRIAL	OUTCOME	ALL HEADS OR ALL TAILS?
1	2 2 2 1 1	no	11		
2	2 1 1 1 1	no	12		
3	2 2 2 2 2	yes	13		
4			14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

3. You go trick-or-treating and there is a house that has their lights off but a large bowl of candy on their front porch....they left a note saying "take just 1" but you want more!!! They have snickers, reeses, almond joys, and Hershey bars. You want one of each – but don't want to be seen rummaging through the candy. If you grab a handful of 6 candy bars then run away, what's the probability that you get at least one of each type? Create a simulation and determine the sample statistic for getting one of each.

snickers → 1      almond joy → 3       $\text{RandInt}(1, 4, 6)$   
 reeses → 2      Hershey → 4

TRIAL	OUTCOME	ALL CANDY BARS?	TRIAL	OUTCOME	ALL CANDY BARS?
1	3 2 1 3 4 1	yes	11		
2	2 2 2 4 4 2	no	12		
3			13		
4			14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

4. You come across another house that has the same candy as the one before, but they ALSO have king-size butterfingers which are your FAVORITE. If you grab 5 candy bars now, what's the probability of getting at least 2 king-size butterfingers?

snickers → 1      almond joy → 3      Butterfinger → 5  
 reeses → 2      Hershey → 4       $\text{RandInt}(1, 5, 5)$

TRIAL	OUTCOME	AT LEAST 2 BUTTERFINGERS?	TRIAL	OUTCOME	AT LEAST 2 BUTTERFINGERS?
1	3 2 4 4 5	no	6		
2	4 3 5 4 2	no	7		
3	3 5 5 2 4	yes	8		
4			9		
5			10		