Question 1

A family member can go to one of two local hospitals for brain surgery.
Checking the history for the past year, you find that each of the two hospitals has performed brain surgery on 1000 patients. In hospital A 710 patients survived (71%). In hospital B 540 (54%) survived.
Based on the numbers presented, which hospital do you think is superior in brain surgery?

Surely hospital A is better, right?

The below chart summarizes three categories of patients (those entering in fair, serious and critical condition) and the survival rate from surgery (in percent) for the two local hospitals.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Patient Entering Condition** | **Hospital A** | **Hospital B** | **Survivors from A (# and percent)** | **Survivors from B (# and percent)** |
| Fair | 700 | 100 | 600 or 86% | 90 or 90% |
| Serious | 200 | 200 | 100 or 50% | 150 or 75% |
| Critical | 100 | 700 | 10 or 10% | 300 or 43% |
| Total | 1000 | 1000 | 710 or 71% | 540 or 54% |

Looking at the data broken down in this way, we see that Hospital B has a higher success rate in all three categories of patients but when averaged all together, Hospital A has the higher overall survival rate. Based on the numbers presented, which hospital do you think is superior in brain surgery?

Question 2

There are 23 people in this class. What is the probability that at least 2 of the people in the class share the same birthday?

**Question 3**

Let’s say you are a contestant on a game show. The host of the show presents you with a choice of three doors, which we will call doors 1, 2, and 3. You do not know what is behind each door, but you do know that behind two of the doors are beat up 1987 Hyundai Excels, and behind one of the doors is a brand new Cadillac Escalade. The cars were placed randomly behind the doors before the show, and the host knows which car is where. The way the game is played out is as follows. The host lets you choose a door. Assume you choose door #1. Before he opens door #1 to let you see what you have chosen, he opens one of the remaining doors, say door #3, to reveal a Hyundai Excel (he will always open one of the remaining doors that has the booby prize), and asks you whether or not you want to change your choice to door #2. What do you tell him?

Question 4

More often than not, when we are presented with statistics we are given only a measure of central tendency (such as a mean). However, lots of useful information can be gleaned about a dataset if we examine the variance, skew, and the kurtosis of the data as well. Give an example you might encounter. How would knowing the variance, the skew, and/or the kurtosis of the data give you a better idea of the data? What could you do with that information?