**I encourage you to use PHStat as much as possible and attach PHStat outputs to your work. No manual calculation is required.**

[1] As reported by *Runner's World* magazine, the times of the finishers in the New York City 10-km run are normally distributed with a mean of 61 minutes and a standard deviation of 9 minutes. Let x be the finishing time for a finisher in the New York 10-km run.

1. What is the chance that finishers complete the run with the times between 50 and 70 minutes?
2. What is the chance that finishers complete the run with the times more than 75 minutes?
3. How fast would finishers have to complete the run among the top 5% finishers?

[2] In a clinical trial of Lipitor, a common drug used to lower cholesterol, 863 patients were given a treatment of 10-mg Atorvastatin tablets. Among them, 19 patients experienced flu symptoms and 844 patients did not (based on data from Pfizer, Inc.).

1. Estimate the probability that one patient taking the drug will experience flu symptoms.
2. Is this unusual for a patient taking the drug to experience flu symptoms? Explain.
3. If you know that the probability of flu symptoms for a person not receiving any treatment is 0.019, what is the probability that there are 19 who experience flu symptoms among 863 patients? Explain.
4. Is this unusual to find that among 863 patients, there are 19 who experience flu symptoms in c)? Explain.

[3] On average, 70 percent of the passengers on a flight from San Francisco to Boston prefer chicken to fish. Assume that the passengers have only one of two choices, chicken or fish for their meal. If there are 200 passengers on a flight and the airline carries 140 chickens and 60 fish dinners, what is the probability that more than five passengers will be disappointed?

[4] A recent Gallup poll consisted of 1012 randomly selected adults who were asked whether “cloning of humans should or should not be allowed.” Results showed that 89% of those surveyed indicated that cloning should not be allowed.

1. If we assume that people are indifferent so that 50% believe that cloning of humans should not be allowed, find the mean and standard deviation for the numbers of people in groups of 1012 that can be expected to believe that such cloning should not be allowed.
2. Based on the preceding results, does the 89% result for the Gallup poll appear to be unusually higher than the assumed rate of 50%? Does it appear that an overwhelming majority of adults believe that cloning of humans should not be allowed?