Mathematics for IT - Assignment 05
Probability

November 13, 2018

Question 1:
The average score of a subject is 2.89 for the whole class, with a standard deviation of 0.63. If a sample of 25 students is being taken, then find the probability of getting the average of this sample to be more than 3.

Question 2:
An unknown distribution has a mean of 90 and a standard deviation of 15. Samples of size n = 25 are drawn randomly from the population.

1. Find the probability that the sample mean is between 85 and 92.
2. Find the average value that is 2 standard deviations above the the mean of the averages.

Question 3:
Suppose the age a student graduates from Salem State is Normally distributed. If the mean age is 23.1 years and the standard deviation is 3.1 years, what is the probability that 6 randomly selected students had a mean age at graduation that was greater than 27?

Question 4:
Suppose the grades in a finite mathematics class are Normally distributed with a mean of 75 and a standard deviation of 5.

1. What is the probability that a randomly selected student had a grade of at least 83?
2. What is the probability that the average grade for 5 randomly selected students was at least 83?

Question 5:
While checking receipts at Dominos, it was determined that the average amount spent on food per table was $21.50 with a standard deviation of $2.22. If we can assume that the amount of money spent was Normally distributed, what is the probability that the average of 8 checks is between $20 and $23?

Question 6:

The length of time, in hours, it takes an "over 40" group of people to play one soccer match is normally distributed with a mean of 2 hours and a standard deviation of 0.5 hours. A sample of size n = 50 is drawn randomly from the population.

1. Find the probability that the sample mean is between 1.8 hours and 2.3 hours.
2. Find the average value that is 2 standard deviations above the the mean of the averages.

Question 7:

An unknown distribution has a mean of 90 and a standard deviation of 15. A sample of size 80 is drawn randomly from the population.

1. Find the probability that the sum of the 80 values (or the total of the 80 values) is more than 7500.
2. Find the sum that is 1.5 standard deviations below the mean of the sum.

Question 8:

A study involving stress is done on a college campus among the students. The stress scores follow a uniform distribution with the lowest stress score equal to 1 and the highest equal to 5. Using a sample of 75 students, find:

1. The probability that the average stress score for the 75 students is less than 2.
2. The 90th percentile for the average stress score for the 75 students.
3. The probability that the total of the 75 stress scores is less than 200.
4. The 90th percentile for the total stress score for the 75 students.