**STATISTICS**

**ASSIGNMENT (CONFIDENCE INTERVALS)**

**EXERCISE 1.**

Suppose scores on exams in statistics are normally distributed with an unknown population mean and a population standard deviation of 3 points. A random sample of 36 scores is taken and gives a sample mean (sample mean score) of 68. Find a confidence interval estimate for the population mean exam score (the mean score on all exams).

Find a 90% confidence interval for the true (population) mean of statistics exam scores.

**x\_bar = 68**

**n = 36**

**s = 3**

**Margin of error = x\_bar ± z\*s/√¯n**

**Margin of error = 68 ± 1.645\*3//√¯36**

**Margin of error = 0.822**

**90% Confidence Interval = x\_bar ± moe**

**90% Confidence Interval: 68 ± 0.822**

**90% Confidence Interval: 67.178 to 68.822**

**With 90% confidence the population mean is between 67.178 and 68.822, based on 36 samples.**

**EXERCISE 2.**

What is the normal body temperature for healthy humans? A random sample of 130 healthy human body temperatures provided by Allen Shoemaker7 yielded 98.25 degrees and standard deviation 0.73 degrees.

Give a 99% confidence interval for the average body temperature of healthy people.

**x\_bar = 98.25**

**n = 130**

**s = 0.73**

**Margin of error = x\_bar ± z\*s/√¯n**

**Margin of error = 98.25 ± 2.576 \* 0.73 / √¯130**

**Margin of error = 0.1649**

**99% Confidence Interval = x\_bar ± moe**

**99% Confidence Interval: 98.25 ± 0.1649**

**99% Confidence Interval: 98.0851 to 98.4149**

**With 99% confidence the population mean is between 98.0851 and 98.4149, based on 130 samples.**

**EXERCISE 3.**

The administrators for a hospital wished to estimate the average number of days required for inpatient treatment of patients between the ages of 25 and 34. A random sample of 500 hospital patients between these ages produced a mean and standard deviation equal to 5.4 and 3.1 days, respectively.

Construct a 95% confidence interval for the mean length of stay for the population of patients from which the sample was drawn.

**x\_bar = 5.4**

**n = 500**

**s = 3.1**

**Margin of error = x\_bar ± z\*s/√¯n**

**Margin of error = 5.4 ± 1.960\* 3.1/ √¯500**

**Margin of error = 0.2717**

**95% Confidence Interval = x\_bar ± moe**

**95% Confidence Interval: 5.4 ± 0.2717**

**95% Confidence Interval: 5.1283 to 5.6717**

**With 95% confidence the population mean is between 5.1283 and 5.6717, based on 500 samples.**