

L14. Confidence Interval on the Mean; Single Population, Variance Unknown

Example 1

Find the value of the t for the t -value for each of the following.

- Area in the right tail = 0.05, and $df = 12$
- Area in the right tail = 0.125, and $df = 58$
- Area in the left tail = 0.005, and $df = 20$
- Area in the left tail = 0.01, and $df = 1500$
- Area in the right tail = 0.05, for a sample size $n = 25$
- Area in the left tail = 0.025, for a sample of size $n = 15$

Solution

Example 2: Wait Time

A random sample of 16 airline passengers at Trudeau airport showed that the mean time spent waiting in line to check in at the ticket counter was 31 minutes with a standard deviation of 7 minutes. Assuming that wait times for all passengers are normally distributed.

Construct a 90% confidence interval for the mean time spent waiting in line by all passengers at this airport.

Solution

Example 3: Annual Bonuses

Almost all employees working for financial companies in New York receive large bonuses at the end of the year. A sample of 65 employees selected from financial companies in New York City showed that they received an average bonus of \$55 000 last year with a standard deviation of \$18 000.

- a. Construct a 95% confidence interval for the average bonus that all employees working for financial companies in New York receive last year.
- b. Construct a 98% confidence interval for the average bonus that all employees working for financial companies in New York receive last year.
- c. Construct a 99% confidence interval for the average bonus that all employees working for financial companies in New York receive last year.
- d. Of these three intervals, which is the least precise?

Solution

Example 4: Office Workers

A company randomly selected nine office employees and secretly monitored their computers for one month. The time (in hours) spent by these employees used their computers for non-job related activities during this month are as follows

7 12 9 8 11 4 14 1 6

Assuming that such times are normally distributed,

- Calculate the sample average, \bar{x} , and sample standard deviation, s
- Calculate a 95% lower-confidence bound to the corresponding mean for all employees of this company.
- Calculate a 90% upper-confidence bound to the corresponding mean for all employees of this company.

Solution