

# [Quantitative methods and analysis](https://assignbuster.com/quantitative-methods-and-analysis/)

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1. Problem A faster loan processing time increases the productivity of a bank and also leads to greater satisfaction. Let us take the example of a bank in which the bank manager wants to calculate the average loan processing time and establish a baseline for the same. Also his main purpose is to compare this average processing time with that of a competitor famous for quick loan processing. According to market information collected by his staff, the competitor claims its average processing time to be 6 hours (One-sample T-test, 2007).   
2. Methodology for testing   
The financial analyst in the bank makes note of the processing times for 16 applications in the past month on a random basis. The mean and standard deviation for this sample are calculated and compared with the competitor using t-test.   
#   
Loan Processing Time   
1   
4   
2   
5   
3   
6   
4   
7   
5   
8   
6   
2   
7   
10   
8   
4   
9   
3   
10   
4   
11   
5   
12   
7   
13   
7   
14   
12   
15   
3   
16   
4   
Mean   
5. 6875   
Standard Deviation   
2. 701080031   
3. Dependent and Independent variables   
In this t-test, customer satisfaction is the dependent variable and loan processing time is the independent variable.   
4. Hypothesis formulation   
Based on the available information, null and alternate hypothesis can be developed as follows:   
Ho: The loan processing time of the bank is 6 hours (Null hypothesis)   
Ha: The loan processing time of the bank is not equal to 6 hours (Alternate Hypothesis)   
5. Formulation of Confidence Intervals   
Let us use a 95% confidence interval i. e. 95% of the times the mean would lie within this interval. The confidence interval can be calculated as:   
CI = Mean +- t (at 5% alpha level and 15 degrees of freedom for right tailed test)\*Standard deviation/n^. 5   
i. e. CI = 5. 6875 +- 1. 753\*(2. 7011/16^. 5)   
i. e. CI = (4. 504, 6. 871)   
6. Testing & Results   
t statistic= (5. 6875 – 6)/ (2. 701/ (16) ^. 5)   
i. e. t statistic = -. 0289   
p-value for this t statistic value can be calculated at 95% confidence interval and degrees of freedom as 15 (16-1). It comes out as . 511 for a 1-tailed test which would be appropriate for this case.   
Since p-value > . 05, the null hypothesis is accepted and it can be said that there is not a significant difference between the loan processing time of the bank from its competitor.   
7. References   
One Sample T-Test. (2007). Statistical Interference and T-tests. Minitab Inc. retrieved October 19, 2011 from