

## One Sample t-Test

Example: In a study, one wishes to test whether the average test scores is significantly different from 6 or not, at 5% level of significance, using a sample 10 data values as shown in the Data Editor?

- 1) Enter your data into a new data table. Test for normality first. (Check the instruction for normality test.)
- 2) Perform the following menu selections:

The screenshot shows the R Commander interface. The 'Statistics' menu is open, and the path 'Means > Single-sample t-test...' is highlighted. The 'Data Editor' window is also visible, showing a table with 11 rows and 1 column named 'var1'. The data values are: 3, 4, 3, 5, 6, 4, 7, 5, 6, 8, and an empty cell for row 11.

	var1
1	3
2	4
3	3
4	5
5	6
6	4
7	7
8	5
9	6
10	8
11	

- 3) Then fill in the information that was given by the problem. For the null hypothesis that the mean is 6, put value 6 in the **Null hypothesis:  $\mu =$**  box. Since the goal is for testing whether there is significant difference, one should choose Population mean =  $\mu_0$  for choose two-tailed test, and click **OK**.

The 'Single-Sample t-Test' dialog box is shown. The 'Variable (pick one)' dropdown is set to 'var1'. Under 'Alternative Hypothesis', the 'Population mean =  $\mu_0$ ' radio button is selected. The 'Null hypothesis:  $\mu =$ ' text box contains the value '6'. The 'Confidence Level' text box contains the value '.95'. The 'OK', 'Cancel', and 'Help' buttons are visible at the bottom.

R Output:

```
One Sample t-test

data: Dataset$var1
t = -1.7111, df = 9, p-value = 0.1212
alternative hypothesis: true mean is not equal to 6
95 percent confidence interval:
 3.910125 6.289875
sample estimates:
mean of x
 5.1
```

- 4) Interpret the result: The p-value is 0.1212 and it is greater than .05, the 5% level of significance. Therefore, there **is no sufficient evidence** to support the alternative hypothesis that the mean is significant difference from 60.