

Command	Explanation	Abbreviation
scalar a = 5	defines scalar $a = 5$	di
scalar list	lists scalars	
ttail(df,c)	number satisfying $\Pr(T > c)$ for $T \sim T(df)$	
invttail(df,p)	number satisfying $t^*$ such that $\Pr(T > t^*) = p$	
display a	displays value of scalar $a$ or ttail or etc	
ttest x = c	$t$ -test for $H_0 : \mu_x = c, \mu_x \leq c,$ and $\mu_x \geq c$	
mean x, level(95)	estimates mean of $x$ , 95% confidence interval	

### Summary Statistics and Scalars

```
sum x, detail
scalar xbar = r(mean)           xbar equals mean of x
scalar stdev = r(sd)           stdev equals standard deviation of x
scalar n = r(N)                n equals number of observations for x
scalar t = invttail(n-1,0.05/2) t equals 2-sided 5% critical value with df = n - 1
```

### Calculating 95% Confidence Intervals

```
scalar CI_lb = xbar - invttail(n-1,0.05/2)*stdev/sqrt(n)
scalar CI_ub = xbar + invttail(n-1,0.05/2)*stdev/sqrt(n)
di CI_lb, CI_ub
```

Or use mean x. You can change the level to, say, 90%, with command mean x, level(90).

### Hypothesis Testing at .05 Significance

```
di invttail(n-1,0.05/2)           gives 5% critical value for two-sided test
di 2*ttail(n-1,2.15)             gives two-sided p-value for t-statistic 2.15 (or -2.15)
```

```
. ttest price = 7000

One-sample t test
-----+-----
Variable |      Obs       Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
-----+-----
price |         74    6165.257    342.8719    2949.496    5481.914    6848.6
-----+-----
      mean = mean(price)
Ho: mean = 7000
degrees of freedom = 73

      Ha: mean < 7000          Ha: mean != 7000          Ha: mean > 7000
Pr(T < t) = 0.0087          Pr(|T| > |t|) = 0.0174          Pr(T > t) = 0.9913
```

FIGURE 1: The number  $\Pr(|T| > |t|) = 0.0174$  is the two-sided  $p$ -value for null  $H_0 : \mu_{price} = 7000$ . We reject the null at 5% and 10% significance because 0.0174 is less than 0.05 and 0.10. We do not reject at 1% because the  $p$ -value is greater than 0.01. The other two alternative hypotheses are for one-sided tests.