Command	Explanation	Abbreviation
`scalar a = 5`	defines scalar $a = 5$	
`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	`di`
`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-1,0.025)` — t equals 2-sided 5% critical value with $df = n - 1$

Calculating Confidence Intervals

```
scalar CI_lb = xbar - invttail(n-1,0.025)*stdev/sqrt(n)
scalar CI_ub = xbar + invttail(n-1,0.025)*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

`di invttail(n-1,0.025)` — 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)                                            t =  -2.4346
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.