Using The TI-83 for Hypothesis Testing for a Population Correlation Coefficient

You can use the TI-83 calculator to conduct hypothesis testing for a population correlation coefficient.

Hypothesis testing for a population correlation coefficient, ρ, can be one tailed or two tailed:

$\begin{cases} Ho: \rho \geq 0 \\ Ha: \rho < 0 \end{cases}$ Left-tailed test $\qquad \begin{cases} Ho: \rho \leq 0 \\ Ha: \rho > 0 \end{cases}$ Right-tailed test $\qquad \begin{cases} Ho: \rho = 0 \\ Ha: \rho \neq 0 \end{cases}$ Two-tailed test

Ho: no significant negative correlation	Ho: no significant positive correlation	Ho: no significant correlation
Ha: significant negative correlation	Ha: significant positive correlation	Ha: significant correlation

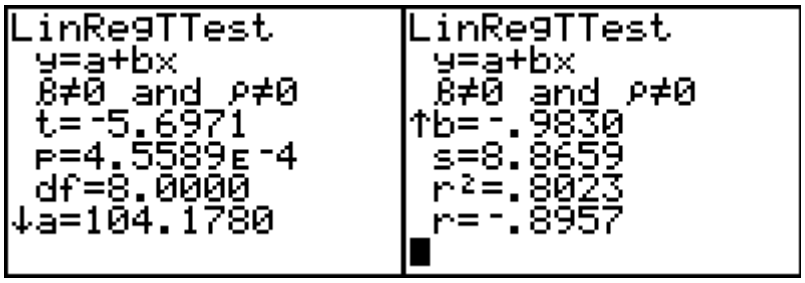
For this class, we will ONLY CONSIDER HYPOTHESIS TESTS FOR ρ THAT ARE TWO TAILED.

Example

Let's look at our latitude and temperature example from class. Enter the x-values (north latitude) in L_1 and y-values (April temperature) in L_2. Hit STAT and arrow over to the TESTS menu. Arrow down and select E:LinRegTTest (linear regression t test). Select L_1 as the Xlist and L_2 as the Ylist. Leave Freq at 1 and select the type of test you are conducting (either two-tail, right tail, or left tail depending upon the alternate hypothesis Ha from above). For our example, we will use a two-tail test. Leave RegEQ blank and then highlight Calculate and hit the ENTER key.

The results of our hypothesis test are displayed. These are: the t test statistic (t = –5.6971), the p–value (p = 4.5589E-4 or 0.00045), the degrees of freedom (d.f. = 8 = n–2), the y-intercept (a = 104.1780) and slope (b = –0.9830) of the regression equation, the sample standard deviation (s = 8.8659), the correlation coefficient (r = –.8957) and the coefficient of determination (r^2 = .8023).

PLEASE NOTE: The regression equation on this screen (y = a + bx) is different than the one on the regression from the CALC menu (y = ax + b). The regression equation is the same, but the values of a and b are different on both screens.



From the screen above, we would reject Ho (large t test statistic and very small p–value) and conclude that there is a significant correlation between latitude and temperature.