Regression Inference

STEP	Confidence Interval	Significance Test
State	We want to estimate the slope β of the population (or true) regression line relating _____ to _____ with __% confidence.	H_0: $\beta = 0$ H_A: β ($<, >, \neq$) 0 Where β is the slope of the population regression line relating _____ to _____. α = ___ (0.05 unless stated otherwise)
Plan	Suppose we have n observations on an explanatory variable x and a response variable y. Our goal is to study or predict the behavior of y for given values of x. Check **LINER.** **Linear:** The actual relationship between x and y is linear. **Independent –** Individual observations are independent of each other. When sampling without replacement, **check the 10% condition:** Check to make sure that 10 times our sample is less than the entire population. **Normal:** For any fixed value of x, the response y varies according to a Normal distribution. **Equal SD:** The standard deviation of y (call it σ) is the same for all values of x. **Random**: The data come from a well-designed random sample or randomized experiment. *Because our conditions are met, we will use a <u>t-interval for the slope of a regression line β.</u>*	Suppose we have n observations on an explanatory variable x and a response variable y. Our goal is to study or predict the behavior of y for given values of x. Check **LINER.** **Linear:** The actual relationship between x and y is linear. **Independent –** Individual observations are independent of each other. When sampling without replacement, **check the 10% condition:** Check to make sure that 10 times our sample is less than the entire population. **Normal:** For any fixed value of x, the response y varies according to a Normal distribution. **Equal SD:** The standard deviation of y (call it σ) is the same for all values of x. **Random**: The data come from a well-designed random sample or randomized experiment. *Because our conditions are met, we will use a*
Do	On the calculator, choose: STAT → TESTS → G: **LinRegTInt** df = (____, ____) (use the equation in the notes if you are given a Minitab Output)	On the calculator, choose: STAT → TESTS → F: **LinRegTTest** df = test statistic = p-value = (use the equation in the notes if you are given a Minitab Output)
Conclude	We are ___% confident that the interval from (____, ____) captures the slope of the population (or true) regression line relating _____ to _____.	Because our P-value = ____ is greater/less than the significance level α = ___, we (fail to) reject H_0. There is (not) convincing evidence that (alternative hypothesis).

Remember that **df = n – 2**

Minitab Output

Predictor	Coef	SE Coef	T	P
Constant	**(y-int)**			
Variable	**(slope)**	**(SE)**	**(test statistic)**	**(p-value)**
S =	R-Sq =		R-Sq(adj) =	