Jake Schinto

Homework #6

1. 9.1 - True
   9.2 - false - The intercept value does not always equal zero.
   9.3 - true
   9.4 - true
   9.5 - false - That would be the alternative hypothesis. H_0 would still be $\beta \leq 0$
   9.6 - false - the denominators could be different when calculating s^2
   9.7 - false - the value of x is not meant to necessarily be minimized
   9.8 - false - the slope should be the same regardless of how units were declared as long as $\Sigma(y-\bar{y})^2$ is minimized
   9.9 - true
   9.10 - True
   9.11 - false - the phrase does not imply anything about the relationship other than that a regression was made
   9.12 - false - it depends on the distribution to determine CI
   9.13 - true
   9.14 - false - The experimenter is trying to determine if corelation exists not assuming there is one
   9.15 - false - could be attributed to the sample data not being an accurate representation
   9.16 - true
   9.17 - false - it is assumed that each x has a normal distribution for y not the entire variable
   9.18 - true
   9.19 - true
   9.20 - false - depends on distribution and how the variables are related

8.5.2. $H_0: \mu = 0$
$H_1: \mu \neq 0$

y_d:	3.5	-5.0	11.0	3.5	5.0
rank:	3.5	-7.5	16	3.5	7.5
y_d:	13.5	0.0	-3.0	-2.0	7.0
rank:	17	N/A	-2	-1	10
y_d:	-7.5	4.0	-4.0	9.0	8.0
rank:	-11	5.5	-5.5	13.5	12
y_d:	-10.0	6.0	9.0		
rank:	-15	9	13.5		

$N = 17 \quad \bar{r} = 4.059$

$N < 20: \quad z = \frac{4.059 - 0.5 - 0}{\sqrt{(18)\cdot(35)/102}} = 1.432$

$1.432 < 1.96$ so we do not reject the null hypothesis and determine that there is no evidence

8.5.3. $H_0: \mu = 0$
$H_1: \mu \neq 0$

y_d:	-0.303	-0.243	-0.103	-0.0933
rank:	-9	-6	-4	-3
y_d:	-0.013	0.018	0.187	0.267
rank:	-1	2	5	7
y_d:	0.287			
	8			

$\bar{r}_1 = -1 \quad z = \frac{-1 - (31)/2}{\sqrt{(30-9)\cdot 31/(12\cdot 9)}} = -6.72$

so reject H_0

9.2.4 - a. $b = \frac{S_{xy}}{S_{xx}} = \frac{\Sigma xy - (\Sigma x)(\Sigma y)/n}{\Sigma x^2 - (\Sigma x)^2/n}$

$b = \frac{7+22+27+52+75 - (15)(55)/5}{1+4+9+16+25 - 225/5} = \frac{18}{10}$

b. $s^2_{x \cdot y} = \frac{\Sigma (y - \hat{y})^2}{n-2} = \frac{16+0+4+4+16}{3} = 13.33$

c. $\beta \leq 0$: H_0

$\beta > 0$: H_1

d. because the keeper wants to know if the slope is positive not either/or

e. $y = \alpha + \beta x + \varepsilon$ exists with ε's independently distributed with mean 0 and a variance σ^2_{yx}