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Date: Feb 23, 2016

Section: 001B

Answer to Question 11.25:

1. Roughly linear, as most points fall closely to the line shown in the ’10-kmTime – Tread-Time plot.
2. The equation is: 10-km time = 58.8 -1.87\*Tread-Time

Answer to Question 11.26:

1. Mean Square Residual Error (MSE) = 4.42, SS(Residual Error)/n-2 = 79.51/18
2. Standard error of beta\_1 = 0.3462
3. 95% CI on beta\_1 = -1.8673 +- 1.96 \* 2.10171 = (-5.9863, 2.2517)

Null hypothesis: beta\_1 =0, the slope of the predictor is zero

Alt. hypothesis: beta\_1 not equal to zero, i.e. the slope of the predictor is not equal to zero

Assumptions:

Linear relationship, normality, homoscadicity

Test statistic = 29.09

p-value= 0.000

we reject the hull hypothesis with 95% statistical confidence

the slope of the predictor is not zero

Conclusion: The predictor can correctly predict 10-km time for some of the Tread-Time values

Answer to Question 11.41:

1. 38.275 from output
2. (36.935, 39.615)

Answer to Question 11.42:

1. 38.23
2. (33.661, 42.889)
3. The equation for prediction interval (PI) has an extra one compared to the formula of confidence interval (CI), making it slightly less accurate for the estimates of means

Answer to Question 11.52:

1. R2yx = SS(Total) – SS(Residual) / SS(Total) = 1171919-4172 / 1171919 = 0.99644 . The calculated R2yx closely matches the output.
2. Value = 0.998 , sign = positive
3. A wide range of values tend to increase the correlation co-efficient ; so if the Run-Size value a re restricted to 1.8, the correlation co-efficient will decrease.

Answer to Question 11.57:

1. 0.99541
2. (0.985839, 0.998518)
3. Hypothesis: Null hypothesis: correlation co-efficient <= 0.99, correlation co-efficient >0.99

Test statistic: 3.03745, p-value=0.2182. We observe that we do not have sufficient statistical confidence to state that that correlation co-efficient is greater than 0.99

1. No, correlation co-efficient express linear associations, where association refers to the general view of how two variables are dependent. No empirical evidence states that the two garages are providing identical estimates for repairs.

Answer to Question 11.92:

1. -0.77073 , the sign means with the increase in housing density , for this dataset, housing sales decreases
2. y\_hat = 141.515 – 12.8959 \* xi
3. σε = √MSE = √472.654 = 21.74

Answer to Question 11.93:

1. Test statistic for beta\_0 = 15.54, test statistic for beta\_1= -6.63

With 99% statistical confidence we can state that slope=beta\_1 is not zero, therefore, there sis statistical evidence that the predictor can predict housing sales from housing density for a few observations.

1. (-16.8667, -8.9184)
2. 95% confidence interval for the true value of the slope, beta\_1= (-16.8667, -8.9184)

95% confidence interval for density =2 = (103.861, 127.620)

95% prediction interval for density =2 = (69.7783, 161.702)