1. A. T – test: used to determine is the groups have some similarity a large t score implies that there is a difference, a small t score implies there is a similarity.

B. H (null): B1 = 0

H (alt): B1 0

C. We can assume that there is a linear relationship between the given dependent and independent variable. We can also assume that the errors are normal and independent.

D. T =

E. Failing to reject the null indicates that there is no relationship between the two variables being analyzed.

1. The MSE measures the average of square error of the predictions.
2. D
3. A. Y = -15.1 \* (ERA) + 152.8

B. Wins decrease by about 15 per ERA.

C. The standard error is 7.636, in this problem the units are wins. The standard error represents how much your sample mean deviates from the actual population mean.

D. The coefficient of determination is .4345, which tells is the proportion of the observed variation in Y explained by X.

E. We can assume that ERA and wins have a linear relation and the errors are normally distributed.

F.

Residual standard error: 7.636 on 28 degrees of freedom

Multiple R-squared: 0.4354, Adjusted R-squared: 0.4152

F-statistic: 21.59 on 1 and 28 DF, p-value: 7.282e-05

This means that there is significant, and we can accept the null. But ERA doesn’t explain Wins very good.

G. 84.85 85

H. Low: 81.545 Upper: 88.239 Fit: 84.89

More confidence means that you are sure, you are right.

I. Low: 82.1131 Upper: 87.67 Fit: 84.89

The interval will be narrower, meaning the interval of acceptance will be smaller. You’re less sure.

J. Low: 68.89 Upper: 100.88 Fit: 84.89

Wins for a team with ERA 4.5 is going to be between 68 and 100

K. .803

1. A.

Your hoping to get a closer fit, in order to minimize the error and obtain a better performing model.

Y = Energy output, X = Temp Difference

Model 1

Y = 7.4 -0.08 \* X

A close up of a map

Description automatically generated

B.

Degree 2

Y = -21.5 + 1.8 \* x - .03 \* x^2

A close up of a map

Description automatically generated

Residual standard error: 0.6169 on 21 degrees of freedom

Multiple R-squared: 0.72, Adjusted R-squared: 0.6933

F-statistic: 26.99 on 2 and 21 DF, p-value: 1.57e-06

C. DEGREE 3 – The best model (PART A)

This is a degree 3 model “STUDENTIZED”, which is the best model

A screenshot of a cell phone

Description automatically generated

P value is low, R value squared is .84, Residual error low

A close up of a map

Description automatically generated

Residual standard error: 0.4639 on 20 degrees of freedom

Multiple R-squared: 0.8492, Adjusted R-squared: 0.8266

F-statistic: 37.54 on 3 and 20 DF, p-value: 2.093e-08

Higher degree: DEGREE 100A close up of a map

Description automatically generated

Residual standard error: 0.5384 on 7 degrees of freedom

Multiple R-squared: 0.9289, Adjusted R-squared: 0.7664

F-statistic: 5.716 on 16 and 7 DF, p-value: 0.01311

D.Using 3rd degree model:  **6.23**