**Linear Regression Runner Data Assessment (Individual)**

Starters-

· Make sure the Data Analysis ToolPack is turned on in Excel.

· Open the document containing the data from the Google Classroom.

· Look at the 2015 City of Oaks Data Tab.

For this project you will be performing linear regression on two sets of runners’ split data for the City of Oaks Marathon. For each set you will answer/complete the following below. The splits data you will be performing the regression on is:

a. 10k split and half marathon

b. Half marathon split and total marathon time

1. Create a scatterplot between each split data above. Be sure to include the following in each scatterplot.

· Plot title, axes labeled

· Tic marks appropriately labeled and spaced

· Markers appropriate size (not too large/small)

· Define x and y variables

2. Based on the scatterplot, describe the relationship between *x* and *y*. Remember to describe strength, form, direction, outliers and influential points.

3. Using the Data Analysis ToolPak in excel, calculate the Least-Squares Regression Line (LSRL). Be sure to include the following:

· Variable definitions

· Interpretations of slope and intercept in context.

· Equation for LSRL, using the context of the data set.

4. Using the results from the regression in *step 3*, find and interpret (in context) the correlation coefficient and coefficient of determination. Be sure to comment if the correlation coefficient match your description of the scatterplot.

5. Determine if the LSRL is a good model for the data. Be sure to calculate the residuals (include the equation for finding residuals-in context), make and interpret the residual plot.

6. Using your two models, predict the *half marathon,* and *total marathon times* given the five runners assigned to you.

7. Poster presentation: Once you have completed all of the work above, you are expected to make a poster presentation with your findings for each data set above, as well as your results for the runners assigned to you. Be sure to discuss anything regarding extrapolation and its effects.