hw8: chapter7-Simple Linear Regression @ STAT 474/475

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Due date: April 7, 2022

In this homework, we utilize the Old Faithful Geyser Data named **faithful** available in R and predict the duration of the geyser eruptions using the length of waiting period until the next eruption. The data **faithful** contains two columns eruptions and waiting, both measured in minutes. The objectives are to answer the following questions towards the exploration of the faithful data.

1. Define response and explanatory variables in relation to the faithful data.
2. Using the formula of the least squares estimates, compute the estimates of and .
3. Verify that your estimates in (b) conform to the estimates from the fitted linear model in R.
4. Find out an estimate of , the residual variance.
5. Find estimates of variance of , and estimate of covariance between and using the formula.
6. Verify the results in (e) using the results of the function **vcov()** applied to the result of the fitted model.
7. Find the predicted values of on , along with the
8. Test the null hypotheses against the two sided alternatives at 5% level of significance. Report the value of the test statistic and p-value.
9. Test the null hypotheses against the two sided alternatives at 5% level of significance. Report the value of the test statistic and p-value.
10. Test the null hypotheses and against the two sided alternatives at 5% level of significance. Report the values of the test statistics and p-values.