Tutorial 7

This question utilizes the ReactorData.csv file. The data contains information from a lab-scale bioreactor. The outcome of interest is the yield of the bioreactor (g). Each batch was performed with a different combination of temperature (measured in C), mixing speed (measured in 100 RPM) and reactor type (one with baffles and one without). For the questions where you need to fit and interpret a regression model, you can assume all of the assumptions hold (you don't need to verify them).

1) Determine the regression line for a simple linear regression model using temperature, mixing speed and reactor type. Copy the summary of the results for each. Show a regression plot for each model and interpret the results.

i. Provide a 95% confidence interval for the prediction from each model at a temperature of 70^oC. Calculate with python. Discuss what this confidence interval means in general and in the context of the example.

ii. Provide a 95% prediction interval for the prediction at a speed of 4000 RPM given SS_x = 184.36. Calculate by hand. Discuss what this prediction interval means in general and in the context of the example.