Regression Exercise

This is a team activity. Allocate the effort.

Answer the following using the cheese taste data. In this case we have a linear model for taste as a function of Lactic.

1. Complete the tables finding the values for **a – g**.
2. Sketch the regression line indicating the critical parts of the plot
3. Find the expected value and confidence intervals for taste when Lactic = .90
4. Compare these results with those you find when using H2S as the predictor variable, which linear model is better for taste? Explain. H2S was a better predictor of taste than lactic, as the H2S model had a substantially higher R^2 value at $R^2 = 0.5712$
5. Grade your work by performing the linear regression with either R and SAS.
6. Which part was hard? Why?
calculating the statistics because they built off each other. But we found the activity helpful in solidifying our understanding

Cheese Taste Data

The MEANS Procedure

Results for Taste, mean = 24.53. for Lactic, mean = 1.44

The REG Procedure

Model: MODEL1

Dependent Variable: taste

↳ 1 regression parameter

Number of Observations Read	30
Number of Observations Used	30

Analysis of Variance					
Source	**DF**	**Sum of Squares**	**Mean Square**	**F Value**	**Pr > F**
Model	1	3800.39797	3800.39797	27.55 **e**	<.0001
Error	~~28~~ 29 **a**	3862.4887 **c**	137.9460 **d**		
Corrected Total	~~30~~ 29 **b**	7662.88667			

Root MSE	11.75 **f**	**R-Square**	0.4959 **g**
Dependent Mean	24.53333	**Adj R-Sq**	0.4779
Coeff Var	47.87381		

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	β_0 −29.85883	10.58232	−2.82	0.0087
Lactic	1	β_1 37.71995	7.18640	5.25	<.0001

$E(x) = 37.71995x - 29.85883$

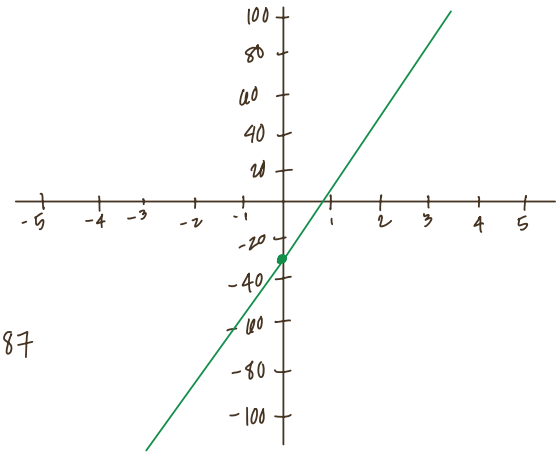
$E(0.9) = 4.089$

CI @ 0.9 = (33.03946, 41.81776)

n: number of observations
p: number of regression parameters

a. degrees of freedom for error = $n-p = 30-1 = 29$

b. corrected degrees of freedom total = 30



c. sum of squares for error $SSE = SSC - SSM = 3862.4887$

d. mean squares for error $MSE = \frac{SSE}{DFE} = 137.9446$

e. F stat $F = \frac{MSM}{MSE} = 27.55$

f. root $MSE = 11.75$

g. $R^2 = \frac{SSM}{SST} = 0.4959$