

## **Part 1: Simple Linear Regression Models**

For the first part of this class we will look at fitting three individual SLR models to the data.

In each case *Taste* is the dependent (response) variable. The independent (predictor) variables are *Acetic*, *H2S* and *Lactic* respectively.

```
> FitA = lm(Taste ~ Acetic)
> FitB = lm(Taste ~ H2S)
> FitC = lm(Taste ~ Lactic)
```

In your submission sheet, write out the regression model for all three models.

Also, compute the confidence intervals for the regression coefficients

- use the `confint()` command, specifying the name of the model.
- We will use the 95% confidence level, which is the default setting.
- Write your answers to 4 decimal places only.

On the table on the submission sheet, write down for each of the fitted models, the following values in the appropriate columns

- Multiple R squared ( hint : use `summary()` command)
- Adjusted R squared ( hint : use `summary()` command)
- AIC ( hint : use `AIC()` command)

## **Part 2: Multiple Linear Regression Models**

We are going to repeat the exercise from part 1, this time using more than one independent variable in each fitted model.

There are three fitted models with 2 independent variables : Fit1, Fit2 and Fit3

There is also one fitted model with all three independent variables : FitAll

```
> Fit1 = lm(Taste ~ Acetic + H2S)
> Fit2 = lm(Taste ~ Acetic + Lactic)
> Fit3 = lm(Taste ~ H2S + Lactic)
> FitAll = lm(Taste ~ Acetic + H2S + Lactic)
```

In your submission sheet, write out the regression model for all of these fitted models.

On the table on the submission sheet, write down for each of the fitted models, the following values in the appropriate columns

- Multiple R squared ( hint : use summary() command)
- Adjusted R squared ( hint : use summary() command)
- AIC ( hint : use AIC() command)

(Confidence Intervals are not required)

The most useful model is the fitted model with the highest value for the specified model selection metric (lowest in the case of AIC).

**Discussion:**

Do all three metrics yield the same conclusion as to which fitted model is the best model?

Why would there be a discrepancy ?

NAME	
ID	

Model	Regression Equation for Fitted Models
Y	
X1	
X2	
X3	
X4	

Model	Confidence Intervals for Regression Coefficients
FitA	
FitB	
FitC	

**Summary of model selection metrics.**

<b>Model</b>	<b>Ind. Variables</b>	<b>Multiple <math>R^2</math></b>	<b>Adjusted <math>R^2</math></b>	<b>AIC</b>
	(Best model)	(highest)	(highest)	(lowest)
FitA	Acetic			
FitB	H2S			
FitC	Lactic			
Fit1	Acetic, H2S			
Fit2	Acetic, Lactic			
Fit3	H2S, Lactic			
FitAll	All Three			

**Discussion:**