

# RED WINE SAS

## Random Forest

### *Loss Reduction Variable Importance*

1. alcohol
2. density
3. sulphates
4. chlorides
5. citric\_acid
6. sugar
7. fix\_acidity
8. pH
9. free\_sulfur
10. total\_sulfur
11. vol\_acidity

## Multiple Regression

1. *citric acid, pH, and fix acidity*  
 $R^2 = 0.0572$

Variable	Type I Sum of Squares	Type II Sum of Squares
citric_acid	53.40525	42.17124
pH	6.22240	4.73777
fix_acidity	0.00451	0.00451

2. *citric acid, pH, and sugar*  
 $R^2 = 0.0575$

Variable	Type I Sum of Squares	Type II Sum of Squares
citric_acid	53.40525	56.41982
pH	6.22240	6.19417

sugar	0.34667	0.34667
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3. *alcohol, density, and sulphates*

$$R^2 = 0.2700$$

Variable	Type I Sum of Squares	Type II Sum of Squares
alcohol	236.29279	159.89336
density	1.95951	0.16188
sulphates	43.17906	43.17906

## Polynomial Regression

1. *alcohol and alcohol<sup>2</sup>*

$$R^2 = 0.2280$$

Variable	Type I Sum of Squares
alcohol	236.29279
alcohol <sup>2</sup>	1.27155