

# Homework 5

*Group 1*

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# 1 Introduction

## 2 Statement of the Problem

## 3 Data Exploration

### 3.1 Variables Explained

The variables provided in the Wine Training Data Set are explained below:

Variable Code	Definition
<b>INDEX</b>	<b>Identification Variable (do not use)</b>
<b>TARGET</b>	Number of Cases Purchased
<b>AcidIndex</b>	<b>Proprietary method of testing total acidity of wine by using a weighted averag</b>
Alcohol	Alcohol Content
<b>Chlorides</b>	<b>Chloride content of wine</b>
CitricAcid	Citric Acid Content
<b>Density</b>	<b>Density of Wine</b>
FixedAcidity	Fixed Acidity of Wine
<b>FreeSulfurDioxide</b>	<b>Sulfur Dioxide content of wine</b>
LabelAppeal	Marketing Score indicating the appeal of label design for consumers. High numbers suggest customers like the label design. Negative numbers suggest customers don't like the design.
<b>ResidualSugar</b>	<b>Residual Sugar of wine</b>
STARS	Wine rating by a team of experts. 4 Stars = Excellent, 1 Star = Poor
<b>Sulphates</b>	<b>Sulfate content of wine</b>
TotalSulfurDioxide	Total Sulfur Dioxide of Wine
<b>VolatileAcidity</b>	<b>Volatile Acid content of wine</b>
pH	pH of wine

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Variable	n	Min	q <sub>1</sub>	$\tilde{x}$	$\bar{x}$	q <sub>3</sub>	Max	s	IQR	#NA
TARGET	12795	0.0	2.0	3.0	3.0	4.0	8.0	1.9	2.0	0
FixedAcidity	12795	-18.1	5.2	6.9	7.1	9.5	34.4	6.3	4.3	0
VolatileAcidity	12795	-2.8	0.1	0.3	0.3	0.6	3.7	0.8	0.5	0
CitricAcid	12795	-3.2	0.0	0.3	0.3	0.6	3.9	0.9	0.5	0
ResidualSugar	12179	-127.8	-2.0	3.9	5.4	15.9	141.2	33.7	17.9	616
Chlorides	12157	-1.2	0.0	0.0	0.1	0.2	1.4	0.3	0.2	638
FreeSulfurDioxide	12148	-555.0	0.0	30.0	30.8	70.0	623.0	148.7	70.0	647
TotalSulfurDioxide	12113	-823.0	27.0	123.0	120.7	208.0	1057.0	231.9	181.0	682
Density	12795	0.9	1.0	1.0	1.0	1.0	1.1	0.0	0.0	0
pH	12400	0.5	3.0	3.2	3.2	3.5	6.1	0.7	0.5	395
Sulphates	11585	-3.1	0.3	0.5	0.5	0.9	4.2	0.9	0.6	1210
Alcohol	12142	-4.7	9.0	10.4	10.5	12.4	26.5	3.7	3.4	653
LabelAppeal	12795	-2.0	-1.0	0.0	0.0	1.0	2.0	0.9	2.0	0
STARS	9436	1.0	1.0	2.0	2.0	3.0	4.0	0.9	2.0	3359

Table 2: