

Dataset Name: winequality-red.csv

Write a program in python to perform following task

a. Rescaling: Normalised the dataset using MinMaxScaler class

b. Standardizing Data (transform them into a standard Gaussian distribution with a mean of 0 and a standard deviation of 1)

c. Binarizing Data using we use the Binarizer class (Using a binary threshold, it is possible to transform our data by marking the values above it 1 and those equal to or below it, 0)

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In [1]: import pandas as pd
from sklearn.preprocessing import MinMaxScaler, StandardScaler, Binarizer

df = pd.read_csv('winequality-red.csv')

# a. Rescaling
min_max = MinMaxScaler()
norm_df = pd.DataFrame(min_max.fit_transform(df), columns=df.columns)
print("Normalized Data:")
print(norm_df.head())

# b. Standardizing
std = StandardScaler()
std_df = pd.DataFrame(std.fit_transform(df), columns=df.columns)
print("\nStandardized Data:")
print(std_df.head())

# c. Binarizing
binarizer = Binarizer(threshold=5.0)
bin_df = pd.DataFrame(binarizer.fit_transform(df), columns=df.columns)
print("\nBinarized Data:")
print(bin_df.head())
```

## Normalized Data:

	fixed acidity	volatile acidity	citric acid	residual sugar	chlorides	\
0	0.247788	0.397260	0.00	0.068493	0.106845	
1	0.283186	0.520548	0.00	0.116438	0.143573	
2	0.283186	0.438356	0.04	0.095890	0.133556	
3	0.584071	0.109589	0.56	0.068493	0.105175	
4	0.247788	0.397260	0.00	0.068493	0.106845	

	free sulfur dioxide	total sulfur dioxide	density	pH	sulphates	\
0	0.140845	0.098940	0.567548	0.606299	0.137725	
1	0.338028	0.215548	0.494126	0.362205	0.209581	
2	0.197183	0.169611	0.508811	0.409449	0.191617	
3	0.225352	0.190813	0.582232	0.330709	0.149701	
4	0.140845	0.098940	0.567548	0.606299	0.137725	

	alcohol	quality
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0	0.153846	0.4
1	0.215385	0.4
2	0.215385	0.4
3	0.215385	0.6
4	0.153846	0.4

## Standardized Data:

	fixed acidity	volatile acidity	citric acid	residual sugar	chlorides	\
0	-0.528360	0.961877	-1.391472	-0.453218	-0.243707	
1	-0.298547	1.967442	-1.391472	0.043416	0.223875	
2	-0.298547	1.297065	-1.186070	-0.169427	0.096353	
3	1.654856	-1.384443	1.484154	-0.453218	-0.264960	
4	-0.528360	0.961877	-1.391472	-0.453218	-0.243707	

	free sulfur dioxide	total sulfur dioxide	density	pH	sulphates	\
0	-0.466193	-0.379133	0.558274	1.288643	-0.579207	
1	0.872638	0.624363	0.028261	-0.719933	0.128950	
2	-0.083669	0.229047	0.134264	-0.331177	-0.048089	
3	0.107592	0.411500	0.664277	-0.979104	-0.461180	
4	-0.466193	-0.379133	0.558274	1.288643	-0.579207	

	alcohol	quality
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0	-0.960246	-0.787823
1	-0.584777	-0.787823
2	-0.584777	-0.787823
3	-0.584777	0.450848
4	-0.960246	-0.787823

## Binarized Data:

	fixed acidity	volatile acidity	citric acid	residual sugar	chlorides	\
0	1.0	0.0	0.0	0.0	0.0	
1	1.0	0.0	0.0	0.0	0.0	
2	1.0	0.0	0.0	0.0	0.0	
3	1.0	0.0	0.0	0.0	0.0	
4	1.0	0.0	0.0	0.0	0.0	

	free sulfur dioxide	total sulfur dioxide	density	pH	sulphates	\
0	1.0	1.0	0.0	0.0	0.0	
1	1.0	1.0	0.0	0.0	0.0	
2	1.0	1.0	0.0	0.0	0.0	
3	1.0	1.0	0.0	0.0	0.0	
4	1.0	1.0	0.0	0.0	0.0	

	alcohol	quality
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0	1.0	0.0
1	1.0	0.0
2	1.0	0.0
3	1.0	1.0
4	1.0	0.0