1. **Histogram: Distribution of Wine Quality Ratings**

import pandas as pd

import numpy as np

import seaborn as sns

import matplotlib.pyplot as plt

# Simulating the loading of a dataset similar to "Wine Quality"

# For the purpose of this example, we'll create a small sample DataFrame that represents the structure and type of data

data = {

'fixed\_acidity': np.random.normal(8.0, 2.0, 100),

'volatile\_acidity': np.random.normal(0.5, 0.1, 100),

'citric\_acid': np.random.uniform(0, 1, 100),

'residual\_sugar': np.random.normal(5.0, 4.5, 100),

'chlorides': np.random.normal(0.08, 0.02, 100),

'free\_sulfur\_dioxide': np.random.normal(15, 10, 100),

'total\_sulfur\_dioxide': np.random.normal(46, 32, 100),

'density': np.random.normal(0.996, 0.002, 100),

'pH': np.random.normal(3.3, 0.15, 100),

'sulphates': np.random.normal(0.65, 0.15, 100),

'alcohol': np.random.normal(10.5, 1.2, 100),

'quality': np.random.randint(3, 9, 100)

}

df = pd.DataFrame(data)

df.describe()

1. **Scatter Plot: Relationship between Alcohol Content and Wine Quality**

import pandas as pd

import seaborn as sns

import matplotlib.pyplot as plt

plt.figure(figsize=(10, 6))

sns.scatterplot(x='alcohol', y='quality', data=df)

plt.title('Relationship between Alcohol Content and Wine Quality')

plt.xlabel('Alcohol Content (%)')

plt.ylabel('Quality Rating')

plt.grid(True)

plt.show()

1. **Box Plot: Distribution of Alcohol Content by Wine Quality**

plt.figure(figsize=(10, 6))

sns.boxplot(x='quality', y='alcohol', data=df)

plt.title('Distribution of Alcohol Content by Wine Quality')

plt.xlabel('Quality Rating')

plt.ylabel('Alcohol Content (%)')

plt.grid(True)

plt.show()

1. **Heatmap: Correlation Matrix of Wine Properties**

plt.figure(figsize=(12, 8))

sns.heatmap(df.corr(), annot=True, cmap='coolwarm', fmt=".2f")

plt.title('Correlation Matrix of Wine Properties')

plt.show()