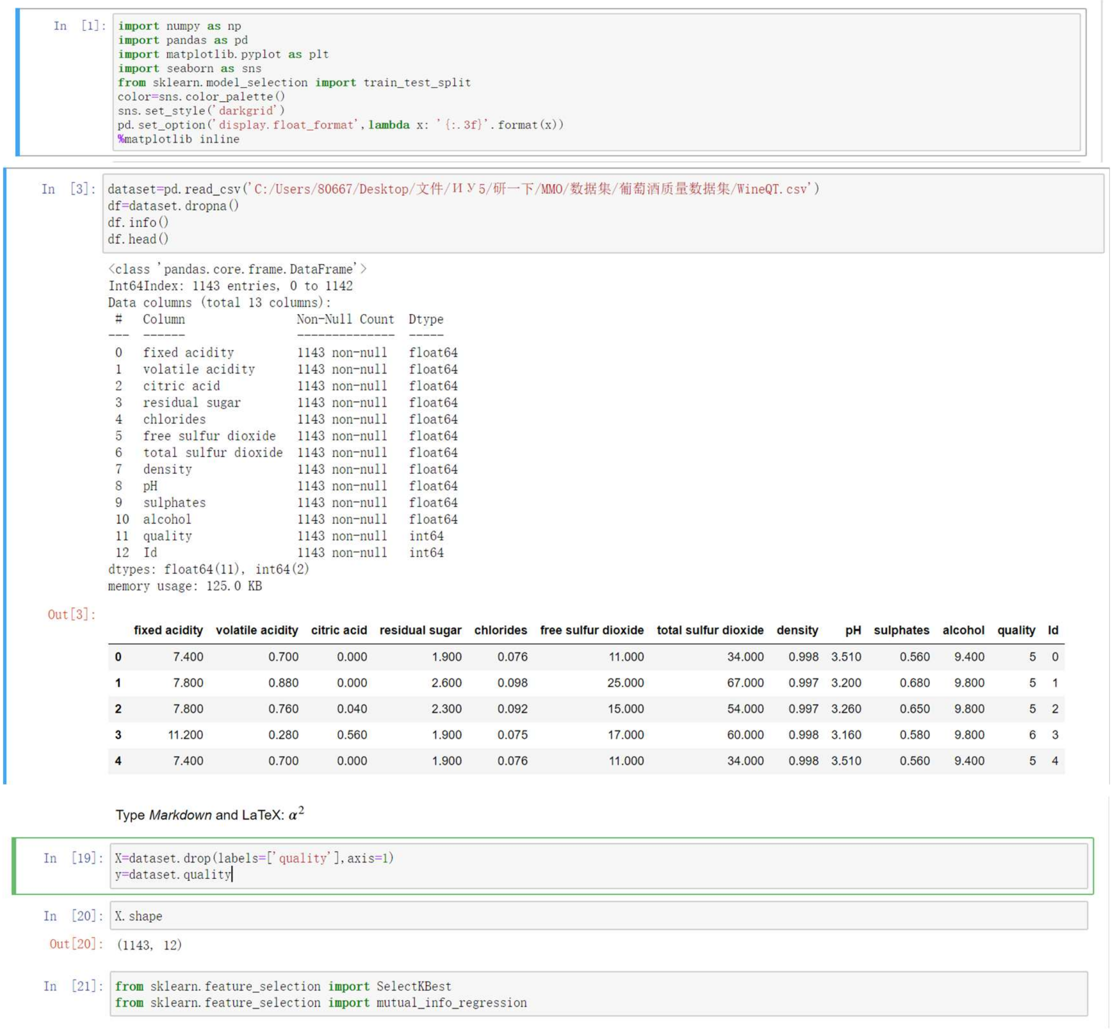
Рубежный контроль

ЧжаоЛян

Вариант:18

Задача1:18. Задача2:38.



```
In [1]: import numpy as np
        import pandas as pd
        import matplotlib.pyplot as plt
        import seaborn as sns
        from sklearn.model_selection import train_test_split
        color=sns.color_palette()
        sns.set_style('darkgrid')
        pd.set_option('display.float_format',lambda x: '{:.3f}'.format(x))
        %matplotlib inline
```

```
In [3]: dataset=pd.read_csv('C:/Users/80667/Desktop/文件/ИУ5/研一下/MMO/数据集/葡萄酒质量数据集/WineQT.csv')
        df=dataset.dropna()
        df.info()
        df.head()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 1143 entries, 0 to 1142
Data columns (total 13 columns):
 #   Column                Non-Null Count  Dtype
---  ------                --------------  -----
 0   fixed acidity         1143 non-null   float64
 1   volatile acidity      1143 non-null   float64
 2   citric acid           1143 non-null   float64
 3   residual sugar        1143 non-null   float64
 4   chlorides             1143 non-null   float64
 5   free sulfur dioxide   1143 non-null   float64
 6   total sulfur dioxide  1143 non-null   float64
 7   density               1143 non-null   float64
 8   pH                    1143 non-null   float64
 9   sulphates             1143 non-null   float64
 10  alcohol               1143 non-null   float64
 11  quality               1143 non-null   int64
 12  Id                    1143 non-null   int64
dtypes: float64(11), int64(2)
memory usage: 125.0 KB
```

Out[3]:

	fixed acidity	volatile acidity	citric acid	residual sugar	chlorides	free sulfur dioxide	total sulfur dioxide	density	pH	sulphates	alcohol	quality	Id
0	7.400	0.700	0.000	1.900	0.076	11.000	34.000	0.998	3.510	0.560	9.400	5	0
1	7.800	0.880	0.000	2.600	0.098	25.000	67.000	0.997	3.200	0.680	9.800	5	1
2	7.800	0.760	0.040	2.300	0.092	15.000	54.000	0.997	3.260	0.650	9.800	5	2
3	11.200	0.280	0.560	1.900	0.075	17.000	60.000	0.998	3.160	0.580	9.800	6	3
4	7.400	0.700	0.000	1.900	0.076	11.000	34.000	0.998	3.510	0.560	9.400	5	4

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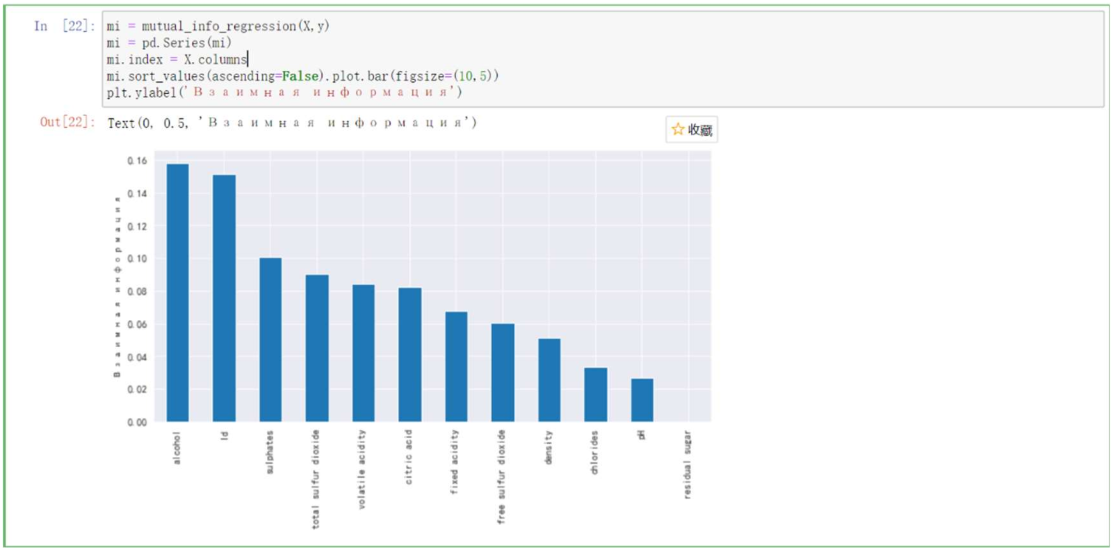
```
In [19]: X=dataset.drop(labels=['quality'],axis=1)
         y=dataset.quality
```

```
In [20]: X.shape

Out[20]: (1143, 12)
```

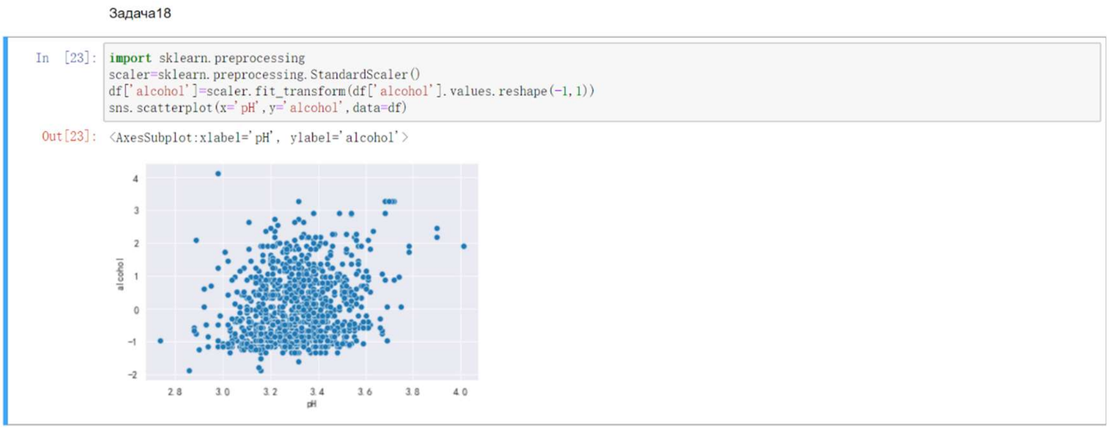
```
In [21]: from sklearn.feature_selection import SelectKBest
         from sklearn.feature_selection import mutual_info_regression
```



```
In [22]: mi = mutual_info_regression(X,y)
         mi = pd.Series(mi)
         mi.index = X.columns
         mi.sort_values(ascending=False).plot.bar(figsize=(10,5))
         plt.ylabel('Взаимная информация')
```

```
Out[22]: Text(0, 0.5, 'Взаимная информация')
```

Задача1:18



Задача18

```
In [23]: import sklearn.preprocessing
         scaler=sklearn.preprocessing.StandardScaler()
         df['alcohol']=scaler.fit_transform(df['alcohol'].values.reshape(-1,1))
         sns.scatterplot(x='pH',y='alcohol',data=df)
```

```
Out[23]: <AxesSubplot:xlabel='pH', ylabel='alcohol'>
```

Задача2:38.

Задача38

```
In [24]: selector=SelectKBest(mutual_info_regression,k=10)
         selector.fit(X,y)
         X_selected=selector.transform(X)
         X_selected.shape

Out[24]: (1143, 10)
```

```
In [25]: selector.get_support(indices=False)

Out[25]: array([ True,  True,  True, False,  True,  True,  True,  True, False,
                 True,  True,  True])
```

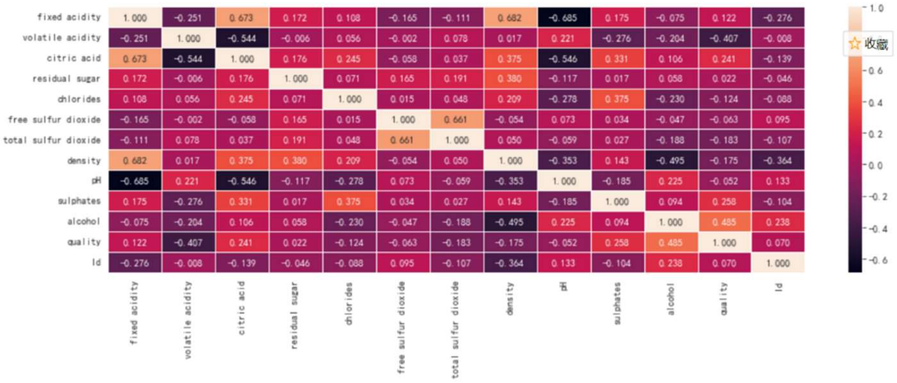
```
In [26]: X.columns[selector.get_support()]

Out[26]: Index(['fixed acidity', 'volatile acidity', 'citric acid', 'chlorides',
                'free sulfur dioxide', 'total sulfur dioxide', 'density', 'sulphates',
                'alcohol', 'Id'],
               dtype='object')
```

Признаки, выбранные серектором:'fixed acidity', 'volatile acidity', 'citric acid', 'chlorides', 'free sulfur dioxide', 'total sulfur dioxide', 'density', 'pH','sulphates', 'alcohol'

```
In [28]: plt.figure(figsize = (16,5))
         sns.heatmap(dataset.corr(), annot=True, linewidth=1,fmt='.3f')

Out[28]: <AxesSubplot:>
```



Корреляция каждого признака с качеством