Зенгер ИУ5-24М Вариант 5

https://www.kaggle.com/iabhishekofficial/mobile-price-classification
(https://www.kaggle.com/iabhishekofficial/mobile-price-classification)

Задача 1 - №5

Для набора данных проведите кодирование одного (произвольного) категориального признака с использованием метода "one-hot encoding".

In [1]:

```
import pandas as pd
from sklearn.preprocessing import OneHotEncoder
```

In [2]:

```
data = pd.read_csv('train.csv')
```

In [3]:

```
data.head()
```

Out[3]:

	battery_power	blue	clock_speed	dual_sim	fc	four_g	int_memory	m_dep	mobile_wt	n_cc
0	842	0	2.2	0	1	0	7	0.6	188	
1	1021	1	0.5	1	0	1	53	0.7	136	
2	563	1	0.5	1	2	1	41	0.9	145	
3	615	1	2.5	0	0	0	10	0.8	131	
4	1821	1	1.2	0	13	1	44	0.6	141	

5 rows × 21 columns

In [5]:

```
# This is the target variable with value of 0(low cost), 1(medium cost),
2(high cost) and 3(very high cost).
data['price_range'].unique()
```

Out[5]:

```
array([1, 2, 3, 0])
```

sklearn

In [7]:

```
ohe = OneHotEncoder()
price_ohe = ohe.fit_transform(data[['price_range']])
```

In [18]:
```
data['price_range'].head(10)
```

Out[18]:
```
0    1
1    2
2    2
3    2
4    1
5    1
6    3
7    0
8    0
9    0
Name: price_range, dtype: int64
```

In [16]:
```
price_ohe.todense()[0:10]
```

Out[16]:
```
matrix([[0., 1., 0., 0.],
        [0., 0., 1., 0.],
        [0., 0., 1., 0.],
        [0., 0., 1., 0.],
        [0., 1., 0., 0.],
        [0., 1., 0., 0.],
        [0., 0., 0., 1.],
        [1., 0., 0., 0.],
        [1., 0., 0., 0.],
        [1., 0., 0., 0.]])
```

pandas

In [20]:
```
pd.get_dummies(data['price_range']).head(10)
```

Out[20]:

	0	1	2	3
0	0	1	0	0
1	0	0	1	0
2	0	0	1	0
3	0	0	1	0
4	0	1	0	0
5	0	1	0	0
6	0	0	0	1
7	1	0	0	0
8	1	0	0	0
9	1	0	0	0

Задача 2 - №25

Для набора данных для одного (произвольного) числового признака проведите обнаружение и удаление выбросов на основе межквартильного размаха.

[https://www.kaggle.com/rashikrahmanpritom/heart-attack-analysis-prediction-dataset (https://www.kaggle.com/rashikrahmanpritom/heart-attack-analysis-prediction-dataset)](https://www.kaggle.com/rashikrahmanpritom/heart-attack-analysis-prediction-dataset)

In [29]:

```
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
import scipy.stats as stats
```

In [67]:

```
data = pd.read_csv('heart.csv')
```

In [68]:

```
data.describe()
```

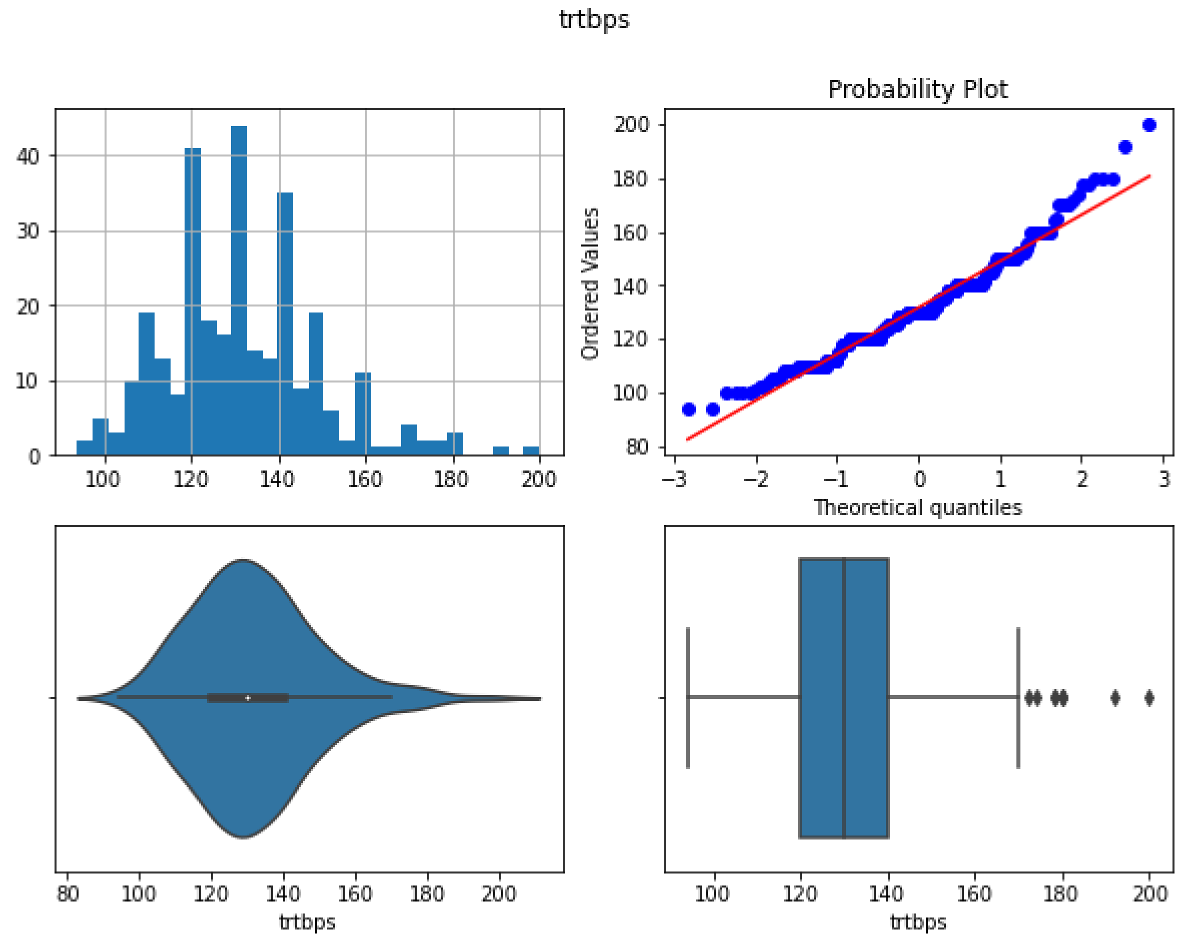
Out[68]:

	age	sex	cp	trtbps	chol	fbs	restecg	th
count	303.000000	303.000000	303.000000	303.000000	303.000000	303.000000	303.000000	303.
mean	54.366337	0.683168	0.966997	131.623762	246.264026	0.148515	0.528053	149.
std	9.082101	0.466011	1.032052	17.538143	51.830751	0.356198	0.525860	22.
min	29.000000	0.000000	0.000000	94.000000	126.000000	0.000000	0.000000	71.
25%	47.500000	0.000000	0.000000	120.000000	211.000000	0.000000	0.000000	133.
50%	55.000000	1.000000	1.000000	130.000000	240.000000	0.000000	1.000000	153.
75%	61.000000	1.000000	2.000000	140.000000	274.500000	0.000000	1.000000	166.
max	77.000000	1.000000	3.000000	200.000000	564.000000	1.000000	2.000000	202.

In [69]:

```
def diagnostic_plots(df, variable, title):
    fig, ax = plt.subplots(figsize=(10,7))
    # гистограмма
    plt.subplot(2, 2, 1)
    df[variable].hist(bins=30)
    ## Q-Q plot
    plt.subplot(2, 2, 2)
    stats.probplot(df[variable], dist="norm", plot=plt)
    # ящик с усами
    plt.subplot(2, 2, 3)
    sns.violinplot(x=df[variable])
    # ящик с усами
    plt.subplot(2, 2, 4)
    sns.boxplot(x=df[variable])
    fig.suptitle(title)
    plt.show()
```

```
In [70]: diagnostic_plots(data, 'trtbps', 'trtbps')
```



```
In [71]: def get_outlier_boundaries(df, col):
             K = 1.5
             quant_75 = df[col].quantile(0.75)
             quant_25 = df[col].quantile(0.25)
             IQR = quant_75 - quant_25
             print('quantile 0.75: ', quant_75)
             print('quantile 0.25: ', quant_25)
             print('IQR: ', IQR)
             lower_boundary = quant_25 - (K * IQR)
             upper_boundary = quant_75 + (K * IQR)
             return lower_boundary, upper_boundary
```

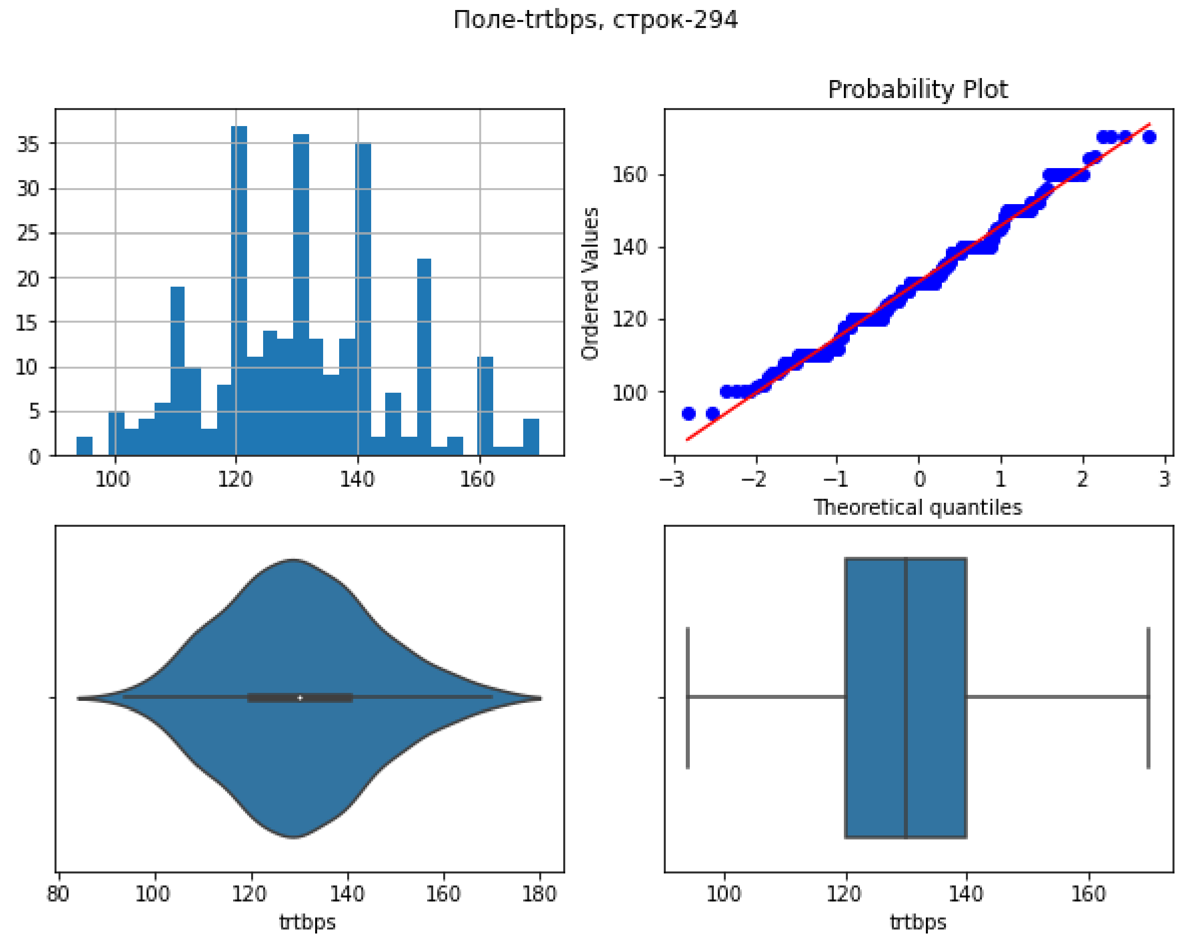
```
In [72]: get_outlier_boundaries(data, 'trtbps')
```

```
quantile 0.75:  140.0
quantile 0.25:  120.0
IQR:  20.0
```

```
Out[72]: (90.0, 170.0)
```

```
In [74]: # Удаление выбросов
         lower_boundary, upper_boundary = get_outlier_boundaries(data, 'trtbps')
         # Флаги для удаления выбросов
         outliers_temp = np.where(data['trtbps'] > upper_boundary, True,
                                  np.where(data['trtbps'] < lower_boundary, True,
         False))
         # Удаление данных на основе флага
         data_trimmed = data.loc[~(outliers_temp), ]
         title = 'Поле-{}, строк-{}'.format('trtbps', data_trimmed.shape[0])
         diagnostic_plots(data_trimmed, 'trtbps', title)
```

```
quantile 0.75:  140.0
quantile 0.25:  120.0
IQR:  20.0
```



Поле-trtbps, строк-294

Probability Plot

```
In [ ]:
```

```
In [ ]:
```