РК1 Кузнецов ИУ5-21М (Вариант 9)

Условия задач

Импорт библиотек

In [ ]:

```
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
%matplotlib inline
sns.set(style="ticks")
```

Загрузка данных

In [32]:

```
from google.colab import drive
drive.mount('/content/drive')

drive_path = '/content/drive/My Drive/'
data = pd.read_csv('/content/drive/My Drive/auto.csv')
```

```
Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mount
("/content/drive", force_remount=True).
```

Первичный анализ данных

Выведем первые 5 строк датасета:

In [33]:

```
data.head()
```

Out[33]:

	name	mpg	cylinders	displacement	horsepower	weight	acceleration	model_year	origin
0	chevrolet chevelle malibu	18.0	8	307.0	130.0	3504	12.0	70	usa
1	buick skylark 320	15.0	8	350.0	165.0	3693	11.5	70	usa
2	plymouth satellite	18.0	8	318.0	150.0	3436	11.0	70	usa
3	amc rebel sst	16.0	8	304.0	150.0	3433	12.0	70	usa
4	ford torino	17.0	8	302.0	140.0	3449	10.5	70	usa

Определим размер датасета:

In [34]:

```
data.shape
```

Out[34]:

```
(398, 9)
```

In [35]:

```
data.dtypes
```

Out[35]:

	0
name	object
mpg	float64
cylinders	int64
displacement	float64
horsepower	float64
weight	int64
acceleration	float64
model_year	int64
origin	object

dtype: object

Проверим наличие пропусков:

In [36]:

```
data.isnull().sum()
```

Out[36]:

	0
name	0
mpg	0
cylinders	0
displacement	0
horsepower	6
weight	0
acceleration	0
model_year	0
origin	0

dtype: int64

Задача № 9

Удалим колонки, содержащие пустые значения:

In [37]:

```
data_new_1 = data.dropna(axis=1, how='any')
(data.shape, data_new_1.shape)
```

Out[37]:

```
((398, 9), (398, 8))
```

Выведем первые строки датасета на экран:

In [38]:

```
data_new_1
```

Out[38]:

	name	mpg	cylinders	displacement	weight	acceleration	model_year	origin
0	chevrolet chevelle malibu	18.0	8	307.0	3504	12.0	70	usa
1	buick skylark 320	15.0	8	350.0	3693	11.5	70	usa
2	plymouth satellite	18.0	8	318.0	3436	11.0	70	usa
3	amc rebel sst	16.0	8	304.0	3433	12.0	70	usa
4	ford torino	17.0	8	302.0	3449	10.5	70	usa
...	...	...	...	...	...	...	...	...
393	ford mustang gl	27.0	4	140.0	2790	15.6	82	usa
394	vw pickup	44.0	4	97.0	2130	24.6	82	europe
395	dodge rampage	32.0	4	135.0	2295	11.6	82	usa
396	ford ranger	28.0	4	120.0	2625	18.6	82	usa
397	chevy s-10	31.0	4	119.0	2720	19.4	82	usa

398 rows × 8 columns

Удалим строки, содержащие пустые значения:

In [39]:

```
data_new_2 = data.dropna(axis=0, how='any')
(data.shape, data_new_2.shape)
```

Out[39]:

```
((398, 9), (392, 9))
```

In [40]:

```
data_new_2.head()
```

Out[40]:

	name	mpg	cylinders	displacement	horsepower	weight	acceleration	model_year	origin
0	chevrolet chevelle malibu	18.0	8	307.0	130.0	3504	12.0	70	usa
1	buick skylark 320	15.0	8	350.0	165.0	3693	11.5	70	usa
2	plymouth satellite	18.0	8	318.0	150.0	3436	11.0	70	usa
3	amc rebel sst	16.0	8	304.0	150.0	3433	12.0	70	usa
4	ford torino	17.0	8	302.0	140.0	3449	10.5	70	usa

Найдем значение квантиля для заполнения пропущенных значений:

In [45]:

```
# quantile_value = data_new_3['horsepower'].quantile(0.95)
data_new_3 = data
quantile_value = data_new_3['horsepower'].quantile(0.95)
```

Замена пропущенных значений на значение из хвоста распределения:

In [46]:

```
data_new_3['horsepower'] = data_new_3['horsepower'].fillna(quantile_value)
```

Выведем на экран:

In [47]:

```
data_new_3.head()
```

Out[47]:

	name	mpg	cylinders	displacement	horsepower	weight	acceleration	model_year	origin
0	chevrolet chevelle malibu	18.0	8	307.0	130.0	3504	12.0	70	usa
1	buick skylark 320	15.0	8	350.0	165.0	3693	11.5	70	usa
2	plymouth satellite	18.0	8	318.0	150.0	3436	11.0	70	usa
3	amc rebel sst	16.0	8	304.0	150.0	3433	12.0	70	usa
4	ford torino	17.0	8	302.0	140.0	3449	10.5	70	usa

In [48]:

```
data_new_3.isnull().sum()
```

Out[48]:

	0
name	0
mpg	0
cylinders	0
displacement	0
horsepower	0
weight	0
acceleration	0
model_year	0
origin	0

dtype: int64

Задача № 29

Выведем первые 20 строк:

In [49]:

```
data.head(20)
```

Out[49]:

	name	mpg	cylinders	displacement	horsepower	weight	acceleration	model_year	origin
0	chevrolet chevelle malibu	18.0	8	307.0	130.0	3504	12.0	70	usa
1	buick skylark 320	15.0	8	350.0	165.0	3693	11.5	70	usa
2	plymouth satellite	18.0	8	318.0	150.0	3436	11.0	70	usa
3	amc rebel sst	16.0	8	304.0	150.0	3433	12.0	70	usa
4	ford torino	17.0	8	302.0	140.0	3449	10.5	70	usa
5	ford galaxie 500	15.0	8	429.0	198.0	4341	10.0	70	usa
6	chevrolet impala	14.0	8	454.0	220.0	4354	9.0	70	usa
7	plymouth fury iii	14.0	8	440.0	215.0	4312	8.5	70	usa
8	pontiac catalina	14.0	8	455.0	225.0	4425	10.0	70	usa

	name	mpg	cylinders	displacement	horsepower	weight	acceleration	model_year	origin
9	amc ambassador dpl	15.0	8	390.0	190.0	3850	8.5	70	usa
10	dodge challenger se	15.0	8	383.0	170.0	3563	10.0	70	usa
11	plymouth 'cuda 340	14.0	8	340.0	160.0	3609	8.0	70	usa
12	chevrolet monte carlo	15.0	8	400.0	150.0	3761	9.5	70	usa
13	buick estate wagon (sw)	14.0	8	455.0	225.0	3086	10.0	70	usa
14	toyota corona mark ii	24.0	4	113.0	95.0	2372	15.0	70	japan
15	plymouth duster	22.0	6	198.0	95.0	2833	15.5	70	usa
16	amc hornet	18.0	6	199.0	97.0	2774	15.5	70	usa
17	ford maverick	21.0	6	200.0	85.0	2587	16.0	70	usa
18	datsun pl510	27.0	4	97.0	88.0	2130	14.5	70	japan
19	volkswagen 1131 deluxe sedan	26.0	4	97.0	46.0	1835	20.5	70	europe

Анализ константных и псевдоконстантных признаков:

In [50]:

```
constant_features = [feat for feat in data.columns if data[feat].nunique() == 1]
pseudo_constant_features = [feat for feat in data.columns if data[feat].value_counts(nor
malize=True).values[0] > 0.99]
```

Удаление константных и псевдоконстантных признаков:

In [51]:

```
data.drop(columns=constant_features + pseudo_constant_features, inplace=True)
```

Выведем полученный результат:

In [52]:

```
data.head()
```

Out[52]:

	name	mpg	cylinders	displacement	horsepower	weight	acceleration	model_year	origin
0	chevrolet chevelle malibu	18.0	8	307.0	130.0	3504	12.0	70	usa
1	buick skylark 320	15.0	8	350.0	165.0	3693	11.5	70	usa
2	plymouth satellite	18.0	8	318.0	150.0	3436	11.0	70	usa
3	amc rebel sst	16.0	8	304.0	150.0	3433	12.0	70	usa
4	ford torino	17.0	8	302.0	140.0	3449	10.5	70	usa

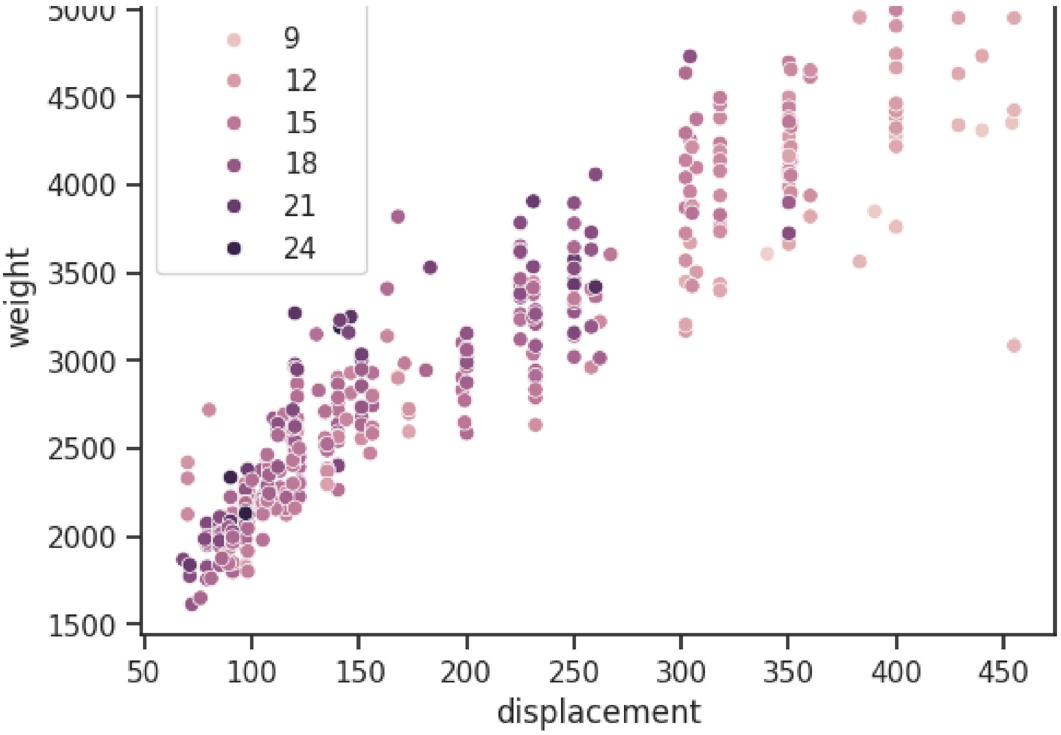
Диаграмма рассеяния:

In [58]:

```
sns.scatterplot(
    data=data,
    y="weight",
    x="displacement",
    hue="acceleration"
)
```

Out[58]:

```
<Axes: xlabel='displacement', ylabel='weight'>
```


9
12
15
18
21
24
5000
4500
4000
3500
3000
2500
2000
1500
weight
50
100
150
200
250
300
350
400
450
displacement