РК 1 Зоров Владислав ИУ5-22М, вариант 4, задачи 4, 24

Для произвольной колонки данных построить гистограмму.

Задача 4 Для набора данных проведите кодирование одного (произвольного) категориального признака с использованием метода "label encoding".

Задача 24 Для набора данных для одного (произвольного) числового признака проведите обнаружение и удаление выбросов на основе 5% и 95% квантилей.

Задача 4

In [20]:

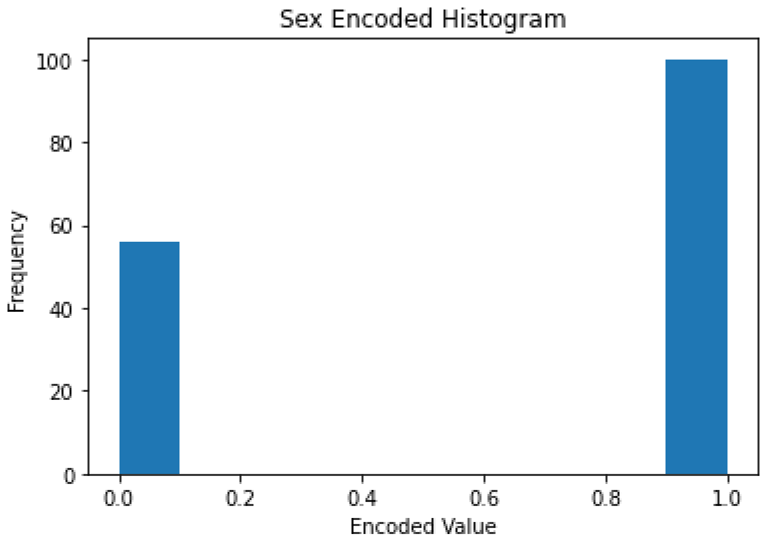
```
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.preprocessing import LabelEncoder

# Загрузка данных
data = pd.read_csv('E:/titanic.csv')
#Для кодирования категориального признака воспользуюсь методом "label encoding", кодирую 

print(data)
# Создание объекта LabelEncoder
le = LabelEncoder()

# Кодирование категориального признака
data['sex_encoded'] = le.fit_transform(data['Sex'])

print(data)
# Был закодирован признак Sex, построю гистограмму для него
# Наличие пропуска кают у некоторых пассажиров не влияет на результат кодировки возраста
```

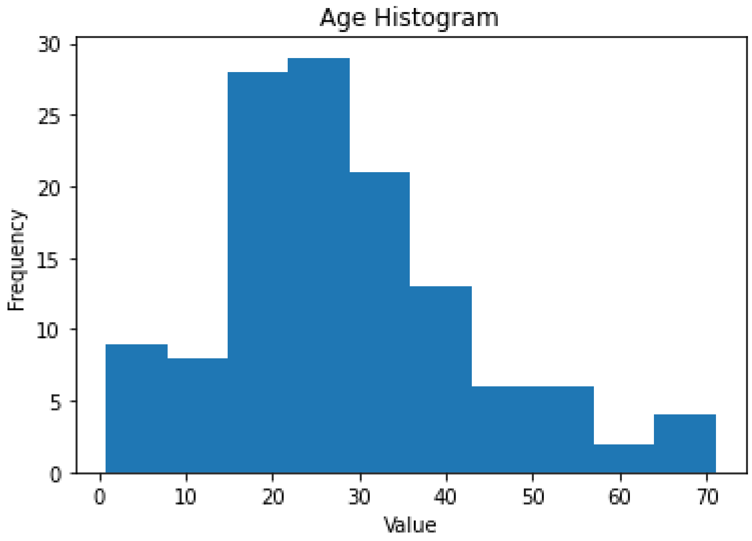
```
     PassengerId  Survived  Pclass         Lname  \
0              1         0       3        Braund   
1              2         1       1       Cumings   
2              3         1       3     Heikkinen   
3              4         1       1      Futrelle   
4              5         0       3         Allen   
..           ...       ...     ...           ...   
151          152         1       1         Pears   
152          153         0       3           Meo   
153          154         0       3  van Billiard   
154          155         0       3         Olsen   
155          156         0       1      Williams   

                                           Name     Sex   Age  SibSp  Parch  \
0                               Mr. Owen Harris    male  22.0      1      0   
1    Mrs. John Bradley (Florence Briggs Thayer)  female  38.0      1      0   
2                                   Miss. Laina  female  26.0      0      0   
3            Mrs. Jacques Heath (Lily May Peel)  female  35.0      1      0   
4                             Mr. William Henry    male  35.0      0      0   
..                                          ...     ...   ...    ...    ...   
151                 Mrs. Thomas (Edith Wearne)  female  22.0      1      0   
152                                 Mr. Alfonzo    male  55.5      0      0   
153                           Mr. Austin Blyler    male  40.5      0      2   
154                              Mr. Ole Martin    male   NaN      0      0   
155                           Mr. Charles Duane    male  51.0      0      1   
```

```
                Ticket     Fare Cabin Embarked
0            A/5 21171   7.2500   NaN        S
1             PC 17599  71.2833   C85        C
2     STON/O2. 3101282   7.9250   NaN        S
3               113803  53.1000  C123        S
4               373450   8.0500   NaN        S
..                 ...      ...   ...      ...
151             113776  66.6000    C2        S
152         A.5. 11206   8.0500   NaN        S
153           A/5. 851  14.5000   NaN        S
154          Fa 265302   7.3125   NaN        S
155           PC 17597  61.3792   NaN        C

[156 rows x 13 columns]
     PassengerId  Survived  Pclass         Lname  \
0              1         0       3        Braund
1              2         1       1       Cumings
2              3         1       3     Heikkinen
3              4         1       1      Futrelle
4              5         0       3         Allen
..           ...       ...     ...           ...
151          152         1       1         Pears
152          153         0       3           Meo
153          154         0       3  van Billiard
154          155         0       3         Olsen
155          156         0       1      Williams

                                           Name     Sex   Age  SibSp  Parch  \
0                              Mr. Owen Harris    male  22.0      1      0
1     Mrs. John Bradley (Florence Briggs Thayer)  female  38.0      1      0
2                                   Miss. Laina  female  26.0      0      0
3             Mrs. Jacques Heath (Lily May Peel)  female  35.0      1      0
4                             Mr. William Henry    male  35.0      0      0
..                                          ...     ...   ...    ...    ...
151                   Mrs. Thomas (Edith Wearne)  female  22.0      1      0
152                                 Mr. Alfonzo    male  55.5      0      0
153                           Mr. Austin Blyler    male  40.5      0      2
154                              Mr. Ole Martin    male   NaN      0      0
155                          Mr. Charles Duane    male  51.0      0      1

                Ticket     Fare Cabin Embarked  sex_encoded
0            A/5 21171   7.2500   NaN        S            1
1             PC 17599  71.2833   C85        C            0
2     STON/O2. 3101282   7.9250   NaN        S            0
3               113803  53.1000  C123        S            0
4               373450   8.0500   NaN        S            1
..                 ...      ...   ...      ...          ...
151             113776  66.6000    C2        S            0
152         A.5. 11206   8.0500   NaN        S            1
153           A/5. 851  14.5000   NaN        S            1
154          Fa 265302   7.3125   NaN        S            1
155           PC 17597  61.3792   NaN        C            1

[156 rows x 14 columns]
```

In [22]:

```
# Построение гистограммы
plt.hist(data['sex_encoded'])
plt.title('Sex Encoded Histogram')
plt.xlabel('Encoded Value')
plt.ylabel('Frequency')
plt.show()

plt.hist(data['Age'])
plt.title('Age Histogram')
plt.xlabel('Value')
plt.ylabel('Frequency')
plt.show()
```





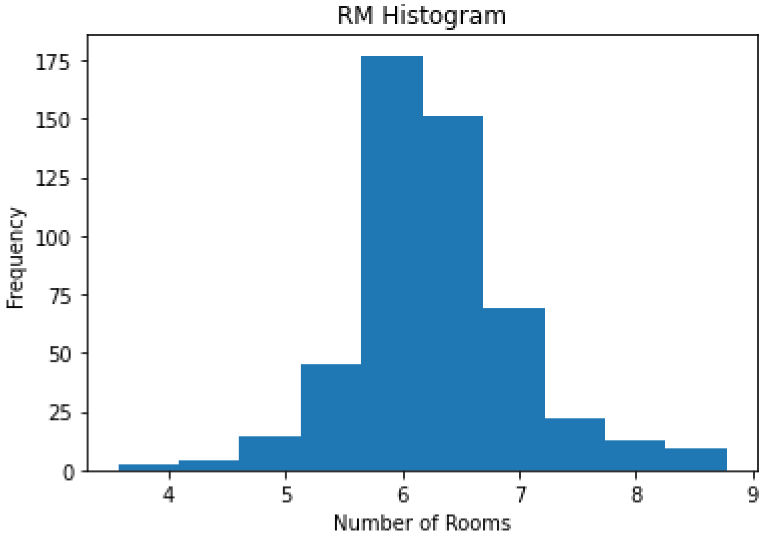
Задача 24

In [23]:

```
import pandas as pd
import matplotlib.pyplot as plt

# Загрузка данных
data = pd.read_csv('E:/BostonHousing.csv')
print(data)




plt.hist(data['rm'])
plt.title('RM Histogram')
plt.xlabel('Number of Rooms')
plt.ylabel('Frequency')
plt.show()
```

```
        crim    zn  indus  chas    nox     rm   age     dis  rad  tax  \
0    0.00632  18.0   2.31     0  0.538  6.575  65.2  4.0900    1  296
1    0.02731   0.0   7.07     0  0.469  6.421  78.9  4.9671    2  242
2    0.02729   0.0   7.07     0  0.469  7.185  61.1  4.9671    2  242
3    0.03237   0.0   2.18     0  0.458  6.998  45.8  6.0622    3  222
4    0.06905   0.0   2.18     0  0.458  7.147  54.2  6.0622    3  222
```

```
..       ...  ...    ...  ...    ...    ...   ...     ...  ...  ...
501  0.06263  0.0  11.93    0  0.573  6.593  69.1  2.4786    1  273
502  0.04527  0.0  11.93    0  0.573  6.120  76.7  2.2875    1  273
503  0.06076  0.0  11.93    0  0.573  6.976  91.0  2.1675    1  273
504  0.10959  0.0  11.93    0  0.573  6.794  89.3  2.3889    1  273
505  0.04741  0.0  11.93    0  0.573  6.030  80.8  2.5050    1  273

     ptratio       b  lstat  medv
0       15.3  396.90   4.98  24.0
1       17.8  396.90   9.14  21.6
2       17.8  392.83   4.03  34.7
3       18.7  394.63   2.94  33.4
4       18.7  396.90   5.33  36.2
..       ...     ...    ...   ...
501     21.0  391.99   9.67  22.4
502     21.0  396.90   9.08  20.6
503     21.0  396.90   5.64  23.9
504     21.0  393.45   6.48  22.0
505     21.0  396.90   7.88  11.9

[506 rows x 14 columns]
```



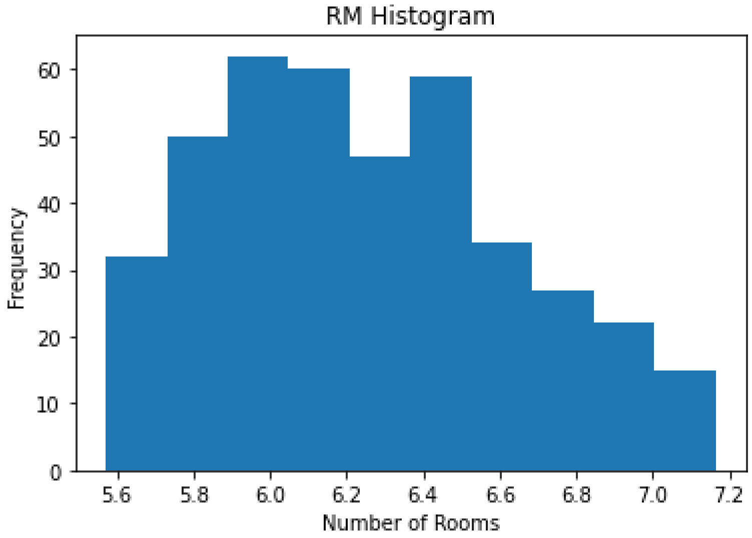
In [18]:

```python
# Определение 5% и 95% квантилей
q05 = data['rm'].quantile(0.05)
q95 = data['rm'].quantile(0.95)


data = data[(data['rm'] >= q05) & (data['rm'] <= q95)]



# Построение гистограммы
plt.hist(data['rm'])
plt.title('RM Histogram')
plt.xlabel('Number of Rooms')
plt.ylabel('Frequency')
plt.show()
```



In [24]:

```
!pip install Pyppeteer
```

```
Collecting Pyppeteer
  Downloading pyppeteer-1.0.2-py3-none-any.whl (83 kB)
Requirement already satisfied: importlib-metadata>=1.4 in c:\users\vladl\anaconda3\lib\sit
e-packages (from Pyppeteer) (4.8.1)
Collecting pyee<9.0.0,>=8.1.0
  Downloading pyee-8.2.2-py2.py3-none-any.whl (12 kB)
Collecting websockets<11.0,>=10.0
  Downloading websockets-10.4-cp39-cp39-win_amd64.whl (101 kB)
Requirement already satisfied: tqdm<5.0.0,>=4.42.1 in c:\users\vladl\anaconda3\lib\site-pa
ckages (from Pyppeteer) (4.62.3)
Requirement already satisfied: certifi>=2021 in c:\users\vladl\anaconda3\lib\site-packages
(from Pyppeteer) (2021.10.8)
Requirement already satisfied: urllib3<2.0.0,>=1.25.8 in c:\users\vladl\anaconda3\lib\site
-packages (from Pyppeteer) (1.26.7)
Requirement already satisfied: appdirs<2.0.0,>=1.4.3 in c:\users\vladl\anaconda3\lib\site-
packages (from Pyppeteer) (1.4.4)
Requirement already satisfied: zipp>=0.5 in c:\users\vladl\anaconda3\lib\site-packages (fr
om importlib-metadata>=1.4->Pyppeteer) (3.6.0)
Requirement already satisfied: colorama in c:\users\vladl\anaconda3\lib\site-packages (fro
m tqdm<5.0.0,>=4.42.1->Pyppeteer) (0.4.4)
Installing collected packages: websockets, pyee, Pyppeteer
Successfully installed Pyppeteer-1.0.2 pyee-8.2.2 websockets-10.4

WARNING: You are using pip version 21.3.1; however, version 23.0.1 is available.
You should consider upgrading via the 'C:\Users\vladl\anaconda3\python.exe -m pip install
--upgrade pip' command.
```

In [27]:

```
!jupyter nbconvert --to webpdf --allow-chromium-download PK1.ipynb
```

```
[NbConvertApp] Converting notebook PK1.ipynb to webpdf
[NbConvertApp] Building PDF
[INFO] Starting Chromium download.

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 92%|#########1| 126M/137M [00:14<00:01, 9.44Mb/s]
 93%|#########2| 127M/137M [00:14<00:01, 8.06Mb/s]
 94%|#########3| 129M/137M [00:14<00:00, 10.7Mb/s]
 95%|#########4| 130M/137M [00:15<00:00, 10.9Mb/s]
 96%|#########5| 131M/137M [00:15<00:00, 10.9Mb/s]
 97%|#########6| 132M/137M [00:15<00:00, 11.4Mb/s]
 97%|#########7| 133M/137M [00:15<00:00, 10.4Mb/s]
 98%|#########8| 134M/137M [00:15<00:00, 8.20Mb/s]
 99%|#########8| 135M/137M [00:15<00:00, 8.31Mb/s]
100%|#########9| 136M/137M [00:15<00:00, 8.75Mb/s]
```

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100%|##########| 137M/137M [00:15<00:00, 8.65Mb/s]
[INFO] Beginning extraction
[INFO] Chromium extracted to: C:\Users\vladl\AppData\Local\pyppeteer\pyppeteer\local-chrom
ium\588429
[NbConvertApp] PDF successfully created
[NbConvertApp] Writing 208249 bytes to PK1.pdf
```

In [ ]:

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