In [145]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

In [146]:

In [147]:
```
dftrain=pd.read_csv(r"C:\USERS\user\Downloads\c7_used_cars - c7_used_cars.csv"
```

Out[147]:

| | Unnamed: 0 | model | year | price | transmission | mileage | fuelType | tax | mpg | engineSize |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 0 | T-Roc | 2019 | 25000 | Automatic | 13904 | Diesel | 145 | 49.6 | 2.0 |
| **1** | 1 | T-Roc | 2019 | 26883 | Automatic | 4562 | Diesel | 145 | 49.6 | 2.0 |
| **2** | 2 | T-Roc | 2019 | 20000 | Manual | 7414 | Diesel | 145 | 50.4 | 2.0 |
| **3** | 3 | T-Roc | 2019 | 33492 | Automatic | 4825 | Petrol | 145 | 32.5 | 2.0 |
| **4** | 4 | T-Roc | 2019 | 22900 | Semi-Auto | 6500 | Petrol | 150 | 39.8 | 1.5 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **99182** | 10663 | A3 | 2020 | 16999 | Manual | 4018 | Petrol | 145 | 49.6 | 1.0 |
| **99183** | 10664 | A3 | 2020 | 16999 | Manual | 1978 | Petrol | 150 | 49.6 | 1.0 |
| **99184** | 10665 | A3 | 2020 | 17199 | Manual | 609 | Petrol | 150 | 49.6 | 1.0 |
| **99185** | 10666 | Q3 | 2017 | 19499 | Automatic | 8646 | Petrol | 150 | 47.9 | 1.4 |
| **99186** | 10667 | Q3 | 2016 | 15999 | Manual | 11855 | Petrol | 150 | 47.9 | 1.4 |

99187 rows × 11 columns

In [148]:

Out[148]:
```
Index(['Unnamed: 0', 'model', 'year', 'price', 'transmission', 'mileage',
       'fuelType', 'tax', 'mpg', 'engineSize', 'Make'],
      dtype='object')
```

In [149]:
```
a=dftrain[['Unnamed: 0','mileage','tax','mpg','engineSize']]
```

Out[149]:

| | Unnamed: 0 | mileage | tax | mpg | engineSize |
|---|---|---|---|---|---|
| **0** | 0 | 13904 | 145 | 49.6 | 2.0 |
| **1** | 1 | 4562 | 145 | 49.6 | 2.0 |
| **2** | 2 | 7414 | 145 | 50.4 | 2.0 |
| **3** | 3 | 4825 | 145 | 32.5 | 2.0 |
| **4** | 4 | 6500 | 150 | 39.8 | 1.5 |
| **...** | ... | ... | ... | ... | ... |
| **99182** | 10663 | 4018 | 145 | 49.6 | 1.0 |
| **99183** | 10664 | 1978 | 150 | 49.6 | 1.0 |
| **99184** | 10665 | 609 | 150 | 49.6 | 1.0 |
| **99185** | 10666 | 8646 | 150 | 47.9 | 1.4 |
| **99186** | 10667 | 11855 | 150 | 47.9 | 1.4 |

99187 rows × 5 columns

In [163]:
```
b=dftrain.head(100000)
```

Out[163]:

| | Unnamed: 0 | model | year | price | transmission | mileage | fuelType | tax | mpg | engineSize |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 0 | T-Roc | 2019 | 25000 | Automatic | 13904 | Diesel | 145 | 49.6 | 2.0 |
| **1** | 1 | T-Roc | 2019 | 26883 | Automatic | 4562 | Diesel | 145 | 49.6 | 2.0 |
| **2** | 2 | T-Roc | 2019 | 20000 | Manual | 7414 | Diesel | 145 | 50.4 | 2.0 |
| **3** | 3 | T-Roc | 2019 | 33492 | Automatic | 4825 | Petrol | 145 | 32.5 | 2.0 |
| **4** | 4 | T-Roc | 2019 | 22900 | Semi-Auto | 6500 | Petrol | 150 | 39.8 | 1.5 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **99182** | 10663 | A3 | 2020 | 16999 | Manual | 4018 | Petrol | 145 | 49.6 | 1.0 |
| **99183** | 10664 | A3 | 2020 | 16999 | Manual | 1978 | Petrol | 150 | 49.6 | 1.0 |
| **99184** | 10665 | A3 | 2020 | 17199 | Manual | 609 | Petrol | 150 | 49.6 | 1.0 |
| **99185** | 10666 | Q3 | 2017 | 19499 | Automatic | 8646 | Petrol | 150 | 47.9 | 1.4 |
| **99186** | 10667 | Q3 | 2016 | 15999 | Manual | 11855 | Petrol | 150 | 47.9 | 1.4 |

99187 rows × 11 columns

In [164]:
```
a=b[['Unnamed: 0','mileage','tax','mpg','engineSize']]
```

Out[164]:

| | Unnamed: 0 | mileage | tax | mpg | engineSize |
|---|---|---|---|---|---|
| **0** | 0 | 13904 | 145 | 49.6 | 2.0 |
| **1** | 1 | 4562 | 145 | 49.6 | 2.0 |
| **2** | 2 | 7414 | 145 | 50.4 | 2.0 |
| **3** | 3 | 4825 | 145 | 32.5 | 2.0 |
| **4** | 4 | 6500 | 150 | 39.8 | 1.5 |
| **...** | ... | ... | ... | ... | ... |
| **99182** | 10663 | 4018 | 145 | 49.6 | 1.0 |
| **99183** | 10664 | 1978 | 150 | 49.6 | 1.0 |
| **99184** | 10665 | 609 | 150 | 49.6 | 1.0 |
| **99185** | 10666 | 8646 | 150 | 47.9 | 1.4 |
| **99186** | 10667 | 11855 | 150 | 47.9 | 1.4 |

99187 rows × 5 columns

In [165]:
```
c=a.iloc[:,0:5]
```

In [166]:

Out[166]:
```
(99187, 5)
```

In [167]:

Out[167]:
```
(99187,)
```

In [168]:

In [169]:

In [170]:
```
logr=LogisticRegression()
```

Out[170]:
```
LogisticRegression()
```

In [171]:

In [172]:
```
prediction=logr.predict(observation)
```

Out[172]:
```
array(['BMW'], dtype=object)
```

In [173]:

Out[173]:
```
array(['Audi', 'BMW', 'VW', 'ford', 'hyundi', 'merc', 'skoda', 'toyota',
       'vauxhall'], dtype=object)
```

In [174]:

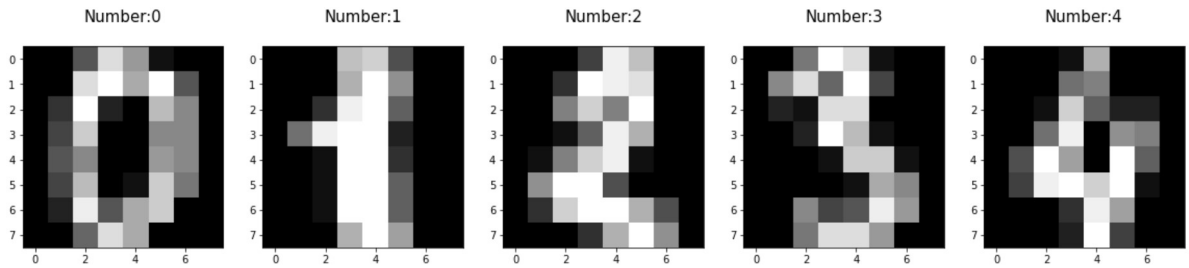
Out[174]: 7.030864093094595e-09

In [175]:
```
import re
from sklearn.datasets import load_digits
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.linear_model import LogisticRegression
```

In [176]:
```
digits=load_digits()
```

Out[176]:
```
{'data': array([[ 0.,  0.,  5., ...,  0.,  0.,  0.],
        [ 0.,  0.,  0., ..., 10.,  0.,  0.],
        [ 0.,  0.,  0., ..., 16.,  9.,  0.],
        ...,
        [ 0.,  0.,  1., ...,  6.,  0.,  0.],
        [ 0.,  0.,  2., ..., 12.,  0.,  0.],
        [ 0.,  0., 10., ..., 12.,  1.,  0.]]),
 'target': array([0, 1, 2, ..., 8, 9, 8]),
 'frame': None,
 'feature_names': ['pixel_0_0',
  'pixel_0_1',
  'pixel_0_2',
  'pixel_0_3',
  'pixel_0_4',
  'pixel_0_5',
  'pixel_0_6',
  'pixel_0_7',
  'pixel_1_0',
  'pixel_1_1',
```

In [177]:
```
plt.figure(figsize=(20,4))
for index,(image,label) in enumerate(zip(digits.data[0:5],digits.target[0:5])):
    plt.subplot(1,5,index+1)
    plt.imshow(np.reshape(image,(8,8)),cmap=plt.cm.gray)
```




In [178]:

In [179]:
```
print(x_train.shape)
print(x_test.shape)
print(y_train.shape)
```

```
(1257, 64)
(540, 64)
(1257,)
(540,)
```

In [180]:
```
logre=LogisticRegression(max_iter=10000)
```

Out[180]:
```
LogisticRegression(max_iter=10000)
```

In [181]:

```
[1 2 5 1 6 7 3 6 1 9 5 6 8 6 6 0 4 7 4 0 6 8 5 8 7 3 7 9 1 4 0 9 5 7 1 3 8
 0 7 6 4 5 6 1 4 8 6 0 7 1 6 9 3 2 6 4 4 6 0 2 5 8 0 2 4 7 6 6 9 7 8 3 0 5
 9 7 7 5 7 2 0 7 9 1 7 1 0 1 4 1 6 0 0 1 8 8 7 0 9 0 3 1 5 6 2 4 7 5 9 1 1
 4 7 2 3 5 1 5 7 7 7 4 5 8 4 0 9 2 9 9 9 6 5 7 4 2 2 4 9 4 9 3 3 3 2 0 4 3
 2 3 9 6 0 1 0 3 8 3 4 2 0 2 5 5 2 0 6 1 1 9 0 4 7 2 3 8 3 3 8 5 6 8 7 3 5
 1 4 7 8 6 8 5 9 9 2 3 0 2 8 6 8 7 5 9 2 9 8 1 3 5 1 7 1 8 6 2 0 4 7 3 0 1
 3 5 4 4 2 3 0 6 8 1 4 7 8 0 1 0 5 4 7 0 4 3 4 8 8 2 6 6 3 2 1 4 1 3 7 2 4
 8 7 0 9 0 9 7 5 1 2 7 6 2 0 0 7 7 8 7 1 0 0 5 1 9 2 6 4 1 3 3 4 6 8 4 0 7
 5 1 3 9 5 8 3 7 4 8 4 2 1 4 9 1 1 6 2 5 3 9 7 2 6 1 9 5 2 0 3 2 7 6 2 7 2
 8 3 1 1 3 7 5 0 6 0 4 3 9 4 1 8 1 3 5 5 6 4 4 8 2 0 9 6 5 1 9 1 4 4 5 0 8
 9 4 2 7 9 7 9 3 0 5 0 8 2 8 9 5 3 7 9 3 2 0 1 9 2 5 8 6 7 0 9 4 8 1 1 3 2
 2 9 2 9 4 0 8 9 6 9 9 5 4 9 7 8 2 4 9 5 3 8 8 6 5 1 9 4 2 8 9 4 2 8 3 2 2
 8 0 5 6 9 8 7 5 7 1 8 5 8 2 0 8 0 7 5 6 1 9 0 3 9 1 7 2 7 4 0 1 7 8 4 3 4
 7 8 1 1 1 4 6 3 4 4 9 4 9 5 7 6 9 5 7 8 0 9 6 2 0 9 8 3 0 9 9 5 9 3 8 6 4
 3 0 9 1 3 2 7 6 0 5 4 8 0 9 3 0 4 7 0 1 6 4]
```

In [182]:

```
0.9740740740740741
```

In [ ]: