In [1]:
```
import numpy as np
import pandas as pd
import matplotlib as mpl
import matplotlib.pyplot as plt
from dataset.model_selection import train_test_split
```

In [2]:
```
dataset.read_csv("C:/Users/PRABHAKAR VIDHAYI/Downloads/Iris (1).data")
```

In [3]:
```
data
```

Out[3]:
```
     5.1  3.5  1.4  0.2  Iris-setosa
0    4.9  3.0  1.4  0.2  Iris-setosa
1    4.7  3.2  1.3  0.2  Iris-setosa
2    4.6  3.1  1.5  0.2  Iris-setosa
3    5.0  3.6  1.4  0.2  Iris-setosa
4    5.4  3.9  1.7  0.4  Iris-setosa
...  ...  ...  ...  ...  ...
144  6.7  3.0  5.2  2.3  Iris-virginica
145  6.3  2.5  5.0  1.9  Iris-virginica
146  6.5  3.0  5.2  2.0  Iris-virginica
147  6.2  3.4  5.4  2.3  Iris-virginica
148  5.9  3.0  5.1  1.8  Iris-virginica

[149 rows x 5 columns]
```

In [4]:
```
data.head()
```

Out[4]:
```
   5.1  3.5  1.4  0.2  Iris-setosa
0  4.9  3.0  1.4  0.2  Iris-setosa
1  4.7  3.2  1.3  0.2  Iris-setosa
2  4.6  3.1  1.5  0.2  Iris-setosa
3  5.0  3.6  1.4  0.2  Iris-setosa
4  5.4  3.9  1.7  0.4  Iris-setosa
```

In [5]:
```
data.tail()
```

Out[5]:
```
     5.1  3.5  1.4  0.2  Iris-setosa
144  6.7  3.0  5.2  2.3  Iris-virginica
145  6.3  2.5  5.0  1.9  Iris-virginica
146  6.5  3.0  5.2  2.0  Iris-virginica
147  6.2  3.4  5.4  2.3  Iris-virginica
148  5.9  3.0  5.1  1.8  Iris-virginica
```

In [6]:
```
data.info()
```

Out[6]:
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 149 entries, 0 to 148
Data columns (total 5 columns):
 #   Column      Non-Null Count  Dtype
---  ------      --------------  -----
 0   5.1         149 non-null    float64
 1   3.5         149 non-null    float64
 2   1.4         149 non-null    float64
 3   0.2         149 non-null    float64
 4   Iris-setosa 149 non-null    object
dtypes: float64(4), object(1)
memory usage: 5.9 KB
```

In [7]:
```
data.shape
```

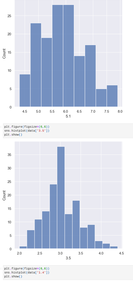
Out[7]:
```
(149, 5)
```

In [8]:
```
data.describe()
```

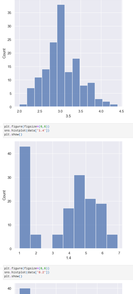
Out[8]:
```
              5.1         3.5         1.4         0.2
count  149.000000  149.000000  149.000000  149.000000
mean     5.848322    3.051007    3.774497    1.205369
std      0.828594    0.433594    1.764420    0.761292
min      4.300000    2.000000    1.000000    0.100000
25%      5.100000    2.800000    1.600000    0.300000
50%      5.800000    3.000000    4.400000    1.300000
75%      6.400000    3.300000    5.100000    1.800000
max      7.900000    4.400000    6.900000    2.500000
```

In [9]:
```
sns.set()
```

In [10]:
```
plt.figure(figsize=(6,6))
sns.histplot(data['5.1'])
plt.show()
```

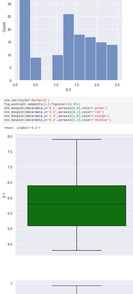


In [11]:
```
plt.figure(figsize=(6,6))
sns.histplot(data['3.5'])
plt.show()
```



In [12]:
```
plt.figure(figsize=(6,6))
sns.histplot(data['1.4'])
plt.show()
```


In [13]:
```
plt.figure(figsize=(6,6))
sns.histplot(data['0.2'])
plt.show()
```

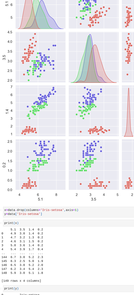


In [14]:
```
sns.set(style='darkgrid')
plt.figure(figsize=(6,6))
sns.boxplot(data.data,x='5.1',orient='h',color='green')
sns.boxplot(data.data,x='3.5',orient='h',color='red')
sns.boxplot(data.data,x='1.4',orient='h',color='orange')
sns.boxplot(data.data,x='0.2',orient='h',color='steelblue')
```

Out[14]:
```
<Axes: xlim=0.0 2.5>
```


In [15]:
```
sns.pairplot(data,hue='Iris-setosa',palette='hls')
```

Out[15]:
```
<seaborn.axisgrid.PairGrid at 0x1b3b8b8b8d0>
```



In [16]:
```
X=data.drop(columns=['Iris-setosa',axis=1)
y=data['Iris-setosa']
```

In [17]:
```
print(X)
     5.1  3.5  1.4  0.2
0    4.9  3.0  1.4  0.2
1    4.7  3.2  1.3  0.2
2    4.6  3.1  1.5  0.2
3    5.0  3.6  1.4  0.2
4    5.4  3.9  1.7  0.4
..   ...  ...  ...  ...
144  6.7  3.0  5.2  2.3
145  6.3  2.5  5.0  1.9
146  6.5  3.0  5.2  2.0
147  6.2  3.4  5.4  2.3
148  5.9  3.0  5.1  1.8

[149 rows x 4 columns]
```

In [18]:
```
print(y)
0       Iris-setosa
1       Iris-setosa
2       Iris-setosa
3       Iris-setosa
4       Iris-setosa
...             ...
144  Iris-virginica
145  Iris-virginica
146  Iris-virginica
147  Iris-virginica
148  Iris-virginica
Name: Iris-setosa, Length: 149, dtype: object
```

In [19]:
```
from dataset.model_selection import train_test_split
X_train,X_test,y_train,y_test=train_test_split(X,y,test_size=0.3)
```

In [20]:
```
X_train
     5.1  3.5  1.4  0.2
97   6.2  2.9  4.3  1.3
110  6.5  3.2  5.1  2.0
50   5.0  3.3  1.4  0.2
8    4.9  3.1  1.5  0.1
9    5.0  3.5  1.3  0.3
..   ...  ...  ...  ...
37   4.9  3.6  1.4  0.1
26   5.0  3.4  1.6  0.4
96   5.7  2.9  4.2  1.3
145  6.3  2.5  5.0  1.9
147  6.2  3.4  5.4  2.3
18   5.7  3.8  1.7  0.3

[104 rows x 4 columns]
```

In [21]:
```
X_test
     5.1  3.5  1.4  0.2
140  6.7  3.1  5.6  2.4
56   5.7  2.8  4.5  1.3
30   4.8  3.1  1.6  0.2
106  7.6  3.0  6.6  2.1
44   5.1  3.8  1.9  0.4
102  7.1  3.0  5.9  2.1
11   4.8  3.4  1.6  0.2
90   5.5  2.6  4.4  1.2
75   6.6  3.0  4.4  1.4
20   5.7  3.8  1.7  0.3
132  6.4  2.8  5.6  2.2
94   5.6  2.7  4.2  1.3
136  6.3  3.4  5.6  2.4
98   5.1  2.5  3.0  1.1
129  7.2  3.0  5.8  1.6
40   5.1  3.4  1.5  0.2
107  6.3  2.9  5.6  1.8
101  5.8  2.7  5.1  1.9
36   5.5  3.5  1.3  0.2
109  6.5  3.2  5.1  2.0
39   4.4  3.0  1.3  0.2
86   6.7  3.1  4.7  1.5
16   5.4  3.9  1.3  0.4
5    4.6  3.4  1.4  0.3
```

In [22]:
```
print(X_train.shape,X_test.shape)
(149, 4) (45, 4)
print('Training data shape : ',X_train[0.shape])
print('Testing data shape : ',X_test[0.shape])
print('Training data shape : ',y_train[0.shape])
print('Testing data shape : ',y_test[0.shape])

Training data shape : (149, 4)
Training data shape :  (104,)
Testing data shape :  (45,)
Testing label shape :  (45,)
```

In [23]:
```
from dataset.preprocessing import MinMaxScaler
from dataset.model_selection import train_test_split
from dataset.linear_model import LogisticRegression,SGDClassifier,Lasso,Ridge
from dataset.ensemble import RF
```

In [24]:
```
model_lsvm = SVC()
```

In [25]:
```
model_lsvm.fit(X_train,y_train)
```

Out[25]:
```
SVC
SVC()
```

In [26]:
```
pred = model_lsvm.predict(X_test)
print
```

Out[26]:
```
array(['Iris-virginica', 'Iris-versicolor', 'Iris-setosa',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-virginica',
       'Iris-virginica', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-setosa', 'Iris-setosa', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-virginica', 'Iris-versicolor', 'Iris-versicolor',
       'Iris-setosa', 'Iris-setosa', 'Iris-versicolor', 'Iris-setosa',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-setosa',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-setosa',
       'Iris-versicolor', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-virginica', 'Iris-setosa', 'Iris-virginica', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-setosa
```

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Ver 1.0