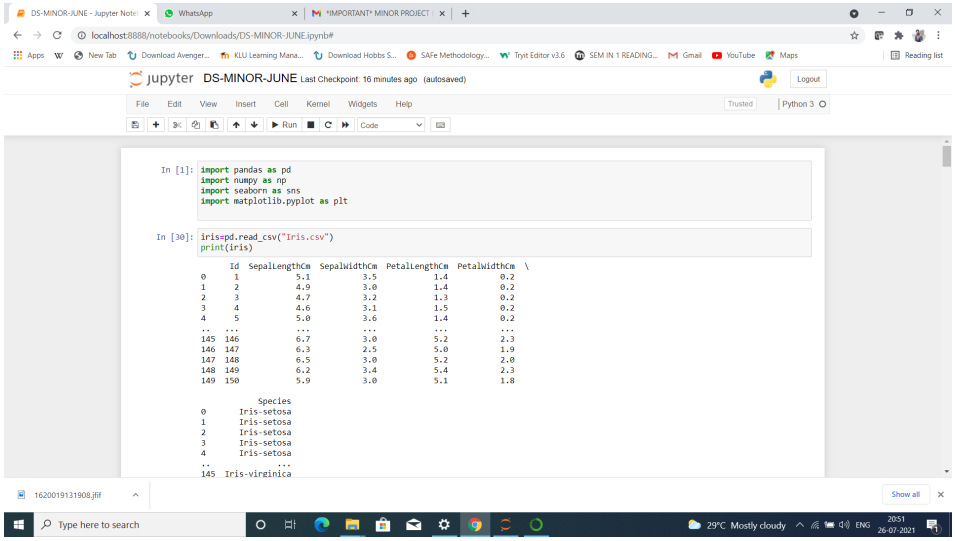
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Code
In [1]:
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
In [30]:
iris=pd.read_csv("Iris.csv")
print(iris)
Id SepalLengthCm SepalWidthCm PetalLengthCm PetalWidthCm \
0 1 5.1 3.5 1.4 0.2
1 2 4.9 3.0 1.4 0.2
2 3 4.7 3.2 1.3 0.2
3 4 4.6 3.1 1.5 0.2
4 5 5.0 3.6 1.4 0.2
.. ..
145 146 6.7 3.0 5.2 2.3
146 147 6.3 2.5 5.0 1.9
147 148 6.5 3.0 5.2 2.0
148 149 6.2 3.4 5.4 2.3
149 150 5.9 3.0 5.1 1.8
Species
0 Iris-setosa
1 Iris-setosa
2 Iris-setosa
3 Iris-setosa
4 Iris-setosa
.. ...
145 Iris-virginica
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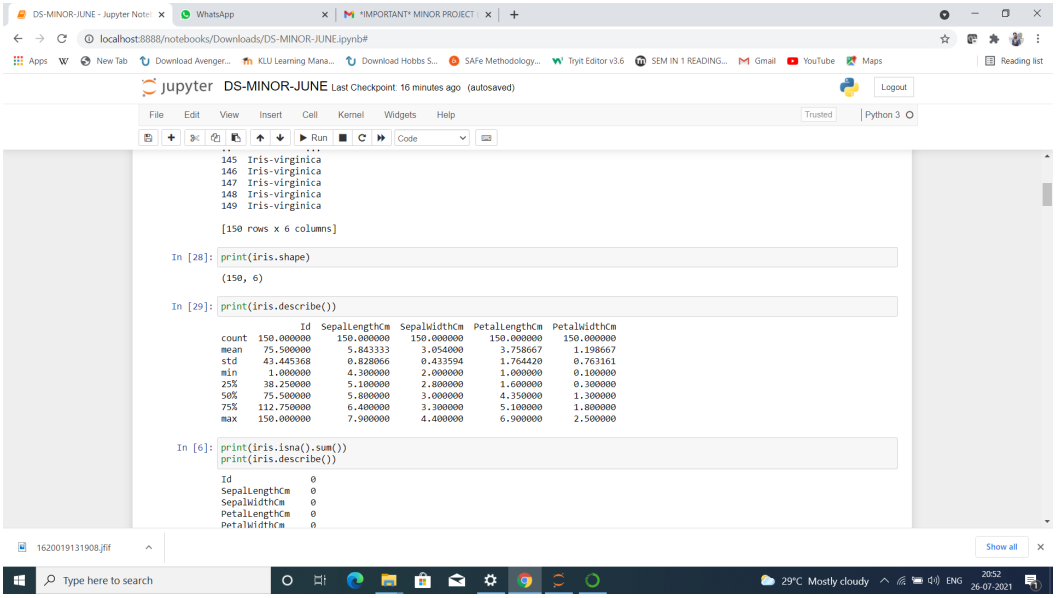
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Run
Code
145 Iris-virginica
146 Iris-virginica
147 Iris-virginica
148 Iris-virginica
149 Iris-virginica
[150 rows x 6 columns]
In [28]:
print(iris.shape)
(150, 6)
In [29]:
print(iris.describe())
Id SepalLengthCm SepalWidthCm PetalLengthCm PetalWidthCm
count 150.000000 150.000000 150.000000 150.000000 150.000000
mean 75.500000 5.843333 3.054000 3.758667 1.198667
std 43.445368 0.828066 0.433594 1.764420 0.763161
min 1.000000 4.300000 2.000000 1.000000 0.100000
25% 38.250000 5.100000 2.800000 1.600000 0.300000
50% 75.500000 5.800000 3.000000 4.350000 1.300000
75% 112.750000 6.400000 3.300000 5.100000 1.800000
max 150.000000 7.900000 4.400000 6.900000 2.500000
In [6]:
print(iris.isna().sum())
print(iris.describe())
Id 0
SepalLengthCm 0
SepalWidthCm 0
PetalLengthCm 0
1620019131908.jfif
Show all
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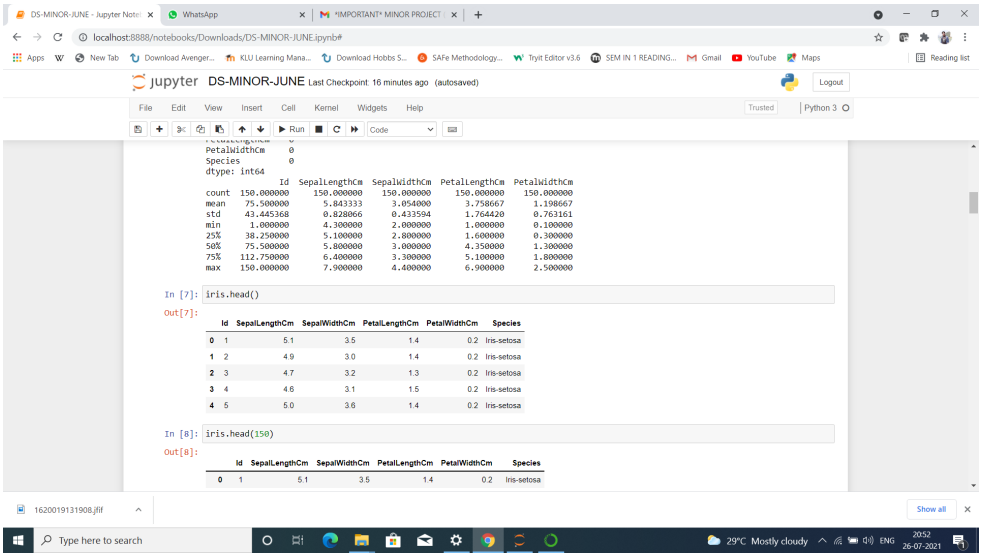
26-07-2021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Python 3
Run
Code
PetalWidthCm 0
Species 0
dtype: int64
Id SepalLengthCm SepalWidthCm PetalLengthCm PetalWidthCm
count 150.000000 150.000000 150.000000 150.000000 150.000000
mean 75.500000 5.843333 3.054000 3.758667 1.198667
std 43.445368 0.828066 0.433594 1.764420 0.763161
min 1.000000 4.300000 2.000000 1.000000 0.100000
25% 38.250000 5.100000 2.800000 1.600000 0.300000
50% 75.500000 5.800000 3.000000 4.350000 1.300000
75% 112.750000 6.400000 3.300000 5.100000 1.800000
max 150.000000 7.900000 4.400000 6.900000 2.500000
In [7]:
iris.head()
Out[7]:
Id SepalLengthCm SepalWidthCm PetalLengthCm PetalWidthCm Species
0 1 5.1 3.5 1.4 0.2 Iris-setosa
1 2 4.9 3.0 1.4 0.2 Iris-setosa
2 3 4.7 3.2 1.3 0.2 Iris-setosa
3 4 4.6 3.1 1.5 0.2 Iris-setosa
4 5 5.0 3.6 1.4 0.2 Iris-setosa
In [8]:
iris.head(150)
Out[8]:
Id SepalLengthCm SepalWidthCm PetalLengthCm PetalWidthCm Species
0 1 5.1 3.5 1.4 0.2 Iris-setosa
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	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa
...	...	...	...	...	...	...
145	146	6.7	3.0	5.2	2.3	Iris-virginica
146	147	6.3	2.5	5.0	1.9	Iris-virginica
147	148	6.5	3.0	5.2	2.0	Iris-virginica
148	149	6.2	3.4	5.4	2.3	Iris-virginica
149	150	5.9	3.0	5.1	1.8	Iris-virginica

150 rows × 6 columns

In [9]:
```
iris.tail(100)
```

Out[9]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
50	51	7.0	3.2	4.7	1.4	Iris-versicolor
51	52	6.4	3.2	4.5	1.5	Iris-versicolor
52	53	6.9	3.1	4.9	1.5	Iris-versicolor
53	54	5.5	2.3	4.0	1.3	Iris-versicolor
54	55	6.5	2.8	4.6	1.5	Iris-versicolor

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145	146	6.7	3.0	5.2	2.3	Iris-virginica
146	147	6.3	2.5	5.0	1.9	Iris-virginica
147	148	6.5	3.0	5.2	2.0	Iris-virginica
148	149	6.2	3.4	5.4	2.3	Iris-virginica
149	150	5.9	3.0	5.1	1.8	Iris-virginica

100 rows × 6 columns

In [15]:
```
n = len(iris[iris['Species'] == 'versicolor'])
print("No of Versicolor in Dataset:",n)
```

```
No of Versicolor in Dataset: 0
```

In [16]:
```
n1 = len(iris[iris['Species'] == 'virginica'])
print("No of Virginica in Dataset:",n1)
```

```
No of Virginica in Dataset: 0
```

In [17]:
```
n2 = len(iris[iris['Species'] == 'setosa'])
print("No of Setosa in Dataset:",n2)
```

```
No of Setosa in Dataset: 0
```

In [18]:
```
fig = plt.figure()
ax = fig.add_axes([0,0,1,1])
ax.axis('equal')
l = ['Versicolor', 'Setosa', 'Virginica']
s = [50,50,50]
```

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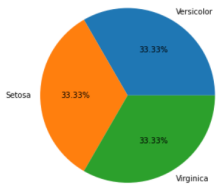
In [18]:
```
fig = plt.figure()
ax = fig.add_axes([0,0,1,1])
ax.axis('equal')
l = ['Versicolor', 'Setosa', 'Virginica']
s = [50,50,50]
ax.pie(s, labels = l,autopct='%1.2f%%')
plt.show()
```



In [33]:
```
#Checking for outliars
import matplotlib.pyplot as plt
plt.figure(1)
plt.boxplot([iris['SepalLengthCm']])
```

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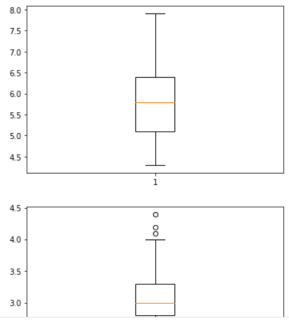
In [47]:
```
import matplotlib.pyplot as plt
plt.figure(1)
plt.boxplot([iris['SepalLengthCm']])
plt.figure(2)
plt.boxplot([iris['SepalWidthCm']])
plt.show()
```



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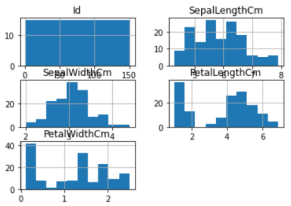
In [22]:
```
iris.hist()
plt.show()
```



In [23]:
```
iris.plot(kind ='density',subplots = True, layout =(3,3),sharex = False)
```

Out[23]:
```
array([[<AxesSubplot:ylabel='Density'>, <AxesSubplot:ylabel='Density'>,
        <AxesSubplot:ylabel='Density'>],
       [<AxesSubplot:ylabel='Density'>, <AxesSubplot:ylabel='Density'>,
        <AxesSubplot:ylabel='Density'>],
       [<AxesSubplot:ylabel='Density'>, <AxesSubplot:ylabel='Density'>,
        <AxesSubplot:ylabel='Density'>]], dtype=object)
```

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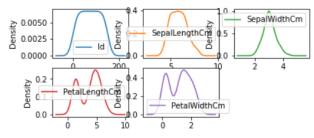
In [23]:
```
iris.plot(kind ='density',subplots = True, layout =(3,3),sharex = False)
```

Out[23]:
```
array([[<AxesSubplot:ylabel='Density'>, <AxesSubplot:ylabel='Density'>,
        <AxesSubplot:ylabel='Density'>],
       [<AxesSubplot:ylabel='Density'>, <AxesSubplot:ylabel='Density'>,
        <AxesSubplot:ylabel='Density'>],
       [<AxesSubplot:ylabel='Density'>, <AxesSubplot:ylabel='Density'>,
        <AxesSubplot:ylabel='Density'>]], dtype=object)
```



In [24]:
```
iris.plot(kind ='box',subplots = True, layout =(2,5),sharex = False)
```

Out[24]:
```
Id               AxesSubplot(0.125,0.536818;0.133621x0.343182)
SepalLengthCm    AxesSubplot(0.285345,0.536818;0.133621x0.343182)
SepalWidthCm     AxesSubplot(0.44569,0.536818;0.133621x0.343182)
PetalLengthCm    AxesSubplot(0.606034,0.536818;0.133621x0.343182)
PetalWidthCm     AxesSubplot(0.766379,0.536818;0.133621x0.343182)
dtype: object
```

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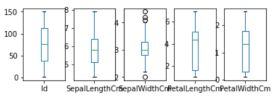
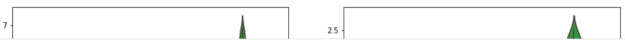
In [24]:
```
iris.plot(kind ='box',subplots = True, layout =(2,5),sharex = False)
```

Out[24]:
```
Id               AxesSubplot(0.125,0.536818;0.133621x0.343182)
SepalLengthCm    AxesSubplot(0.285345,0.536818;0.133621x0.343182)
SepalWidthCm     AxesSubplot(0.44569,0.536818;0.133621x0.343182)
PetalLengthCm    AxesSubplot(0.606034,0.536818;0.133621x0.343182)
PetalWidthCm     AxesSubplot(0.766379,0.536818;0.133621x0.343182)
dtype: object
```



In [34]:
```
plt.figure(figsize=(15,10))
plt.subplot(2,2,1)
sns.violinplot(x='Species',y='PetalLengthCm',data=iris)
plt.subplot(2,2,2)
sns.violinplot(x='Species',y='PetalWidthCm',data=iris)
plt.subplot(2,2,3)
sns.violinplot(x='Species',y='SepalLengthCm',data=iris)
plt.subplot(2,2,4)
sns.violinplot(x='Species',y='SepalWidthCm',data=iris)
```

Out[34]: <AxesSubplot:xlabel='Species', ylabel='SepalWidthCm'>



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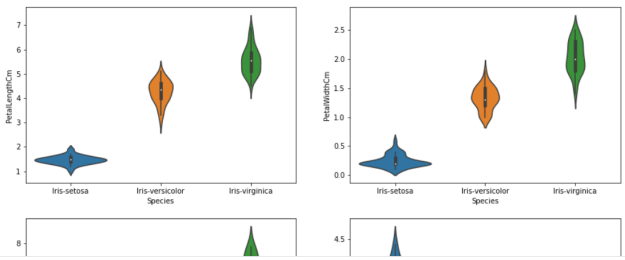
In [34]:
```
plt.figure(figsize=(15,10))
plt.subplot(2,2,1)
sns.violinplot(x='Species',y='PetalLengthCm',data=iris)
plt.subplot(2,2,2)
sns.violinplot(x='Species',y='PetalWidthCm',data=iris)
plt.subplot(2,2,3)
sns.violinplot(x='Species',y='SepalLengthCm',data=iris)
plt.subplot(2,2,4)
sns.violinplot(x='Species',y='SepalWidthCm',data=iris)
```

Out[34]: <AxesSubplot:xlabel='Species', ylabel='SepalWidthCm'>



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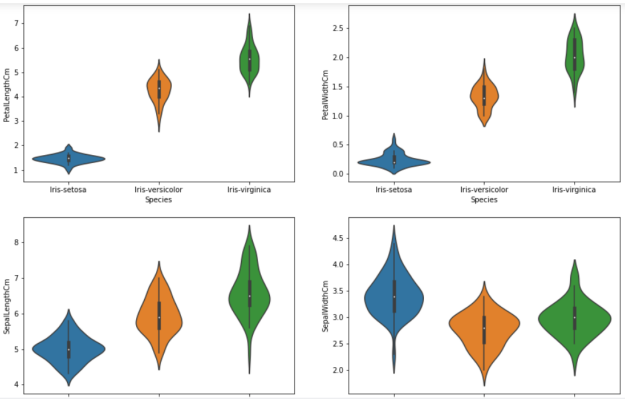

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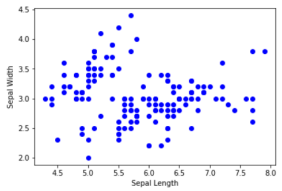
In [35]:
```
X = iris['SepalLengthCm'].values.reshape(-1,1)
print(X)
```

```
[[5.1]
 [4.9]
 [4.7]
 [4.6]
 [5. ]
 [5.4]
 [4.6]
 [5. ]
 [4.4]
 [4.9]
 [5.4]
 [4.8]
 [4.8]
 [4.3]
 [5.8]
 [5.7]
 [5.4]
 [5.1]
 [5.7]
 [5.1]
```

In [36]:
```
Y = iris['SepalWidthCm'].values.reshape(-1,1)
print(Y)
```

```
[[3.5]
 [3. ]
 [3.2]
 [3.1]
 [3.6]
 [3.9]
 [3.4]
 [3.4]
 [2.9]
 [3.1]
 [3.7]
 [3.4]
 [3. ]
 [3. ]
 [4. ]
 [4.4]
 [3.9]
 [3.5]
 [3.8]
 [3.8]
```

In [37]:
```
plt.xlabel("Sepal Length")
plt.ylabel("Sepal Width")
plt.scatter(X,Y,color='b')
plt.show()
```



In [38]:
```
corr_mat = iris.corr()
print(corr_mat)
```

```
                    Id  SepalLengthCm  SepalWidthCm  PetalLengthCm  \
Id            1.000000       0.716676     -0.397729       0.882747
SepalLengthCm 0.716676       1.000000     -0.109369       0.871754
SepalWidthCm -0.397729      -0.109369      1.000000      -0.420516
PetalLengthCm 0.882747       0.871754     -0.420516       1.000000
PetalWidthCm  0.899759       0.817954     -0.356544       0.962757
```

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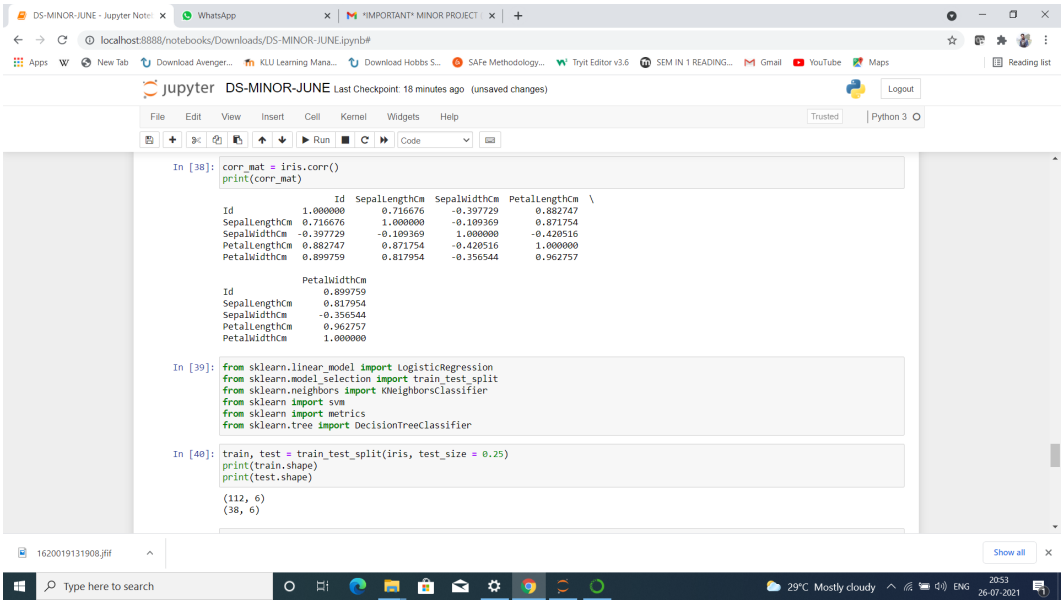

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In [38]:
```
corr_mat = iris.corr()
print(corr_mat)
```

```
                Id  SepalLengthCm  SepalWidthCm  PetalLengthCm  \
Id            1.000000       0.716676     -0.397729       0.882747
SepalLengthCm  0.716676       1.000000     -0.109369       0.871754
SepalWidthCm  -0.397729      -0.109369      1.000000      -0.420516
PetalLengthCm  0.882747       0.871754     -0.420516       1.000000
PetalWidthCm   0.899759       0.817954     -0.356544       0.962757

               PetalWidthCm
Id                 0.899759
SepalLengthCm      0.817954
SepalWidthCm      -0.356544
PetalLengthCm      0.962757
PetalWidthCm       1.000000
```

In [39]:
```
from sklearn.linear_model import LogisticRegression
from sklearn.model_selection import train_test_split
from sklearn.neighbors import KNeighborsClassifier
from sklearn import svm
from sklearn import metrics
from sklearn.tree import DecisionTreeClassifier
```

In [40]:
```
train, test = train_test_split(iris, test_size = 0.25)
print(train.shape)
print(test.shape)
```

```
(112, 6)
(38, 6)
```

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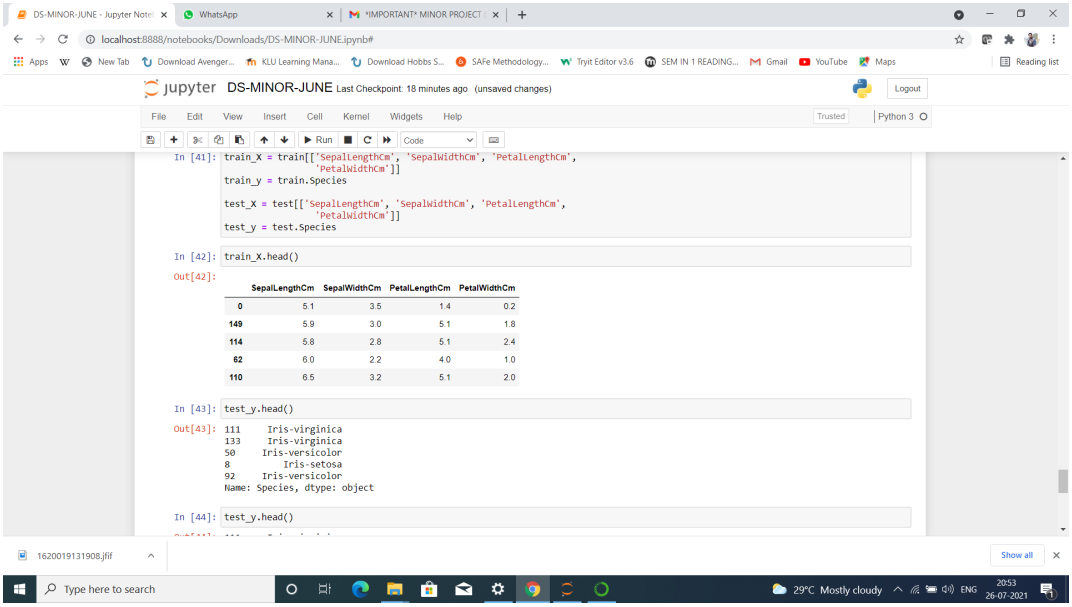

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In [41]:
```
train_X = train[['SepalLengthCm', 'SepalWidthCm', 'PetalLengthCm',
                 'PetalWidthCm']]
train_y = train.Species

test_X = test[['SepalLengthCm', 'SepalWidthCm', 'PetalLengthCm',
               'PetalWidthCm']]
test_y = test.Species
```

In [42]:
```
train_X.head()
```

Out[42]:

	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm
0	5.1	3.5	1.4	0.2
149	5.9	3.0	5.1	1.8
114	5.8	2.8	5.1	2.4
62	6.0	2.2	4.0	1.0
110	6.5	3.2	5.1	2.0

In [43]:
```
test_y.head()
```

Out[43]:
```
111     Iris-virginica
133     Iris-virginica
50     Iris-versicolor
8          Iris-setosa
92     Iris-versicolor
Name: Species, dtype: object
```

In [44]:
```
test_y.head()
```

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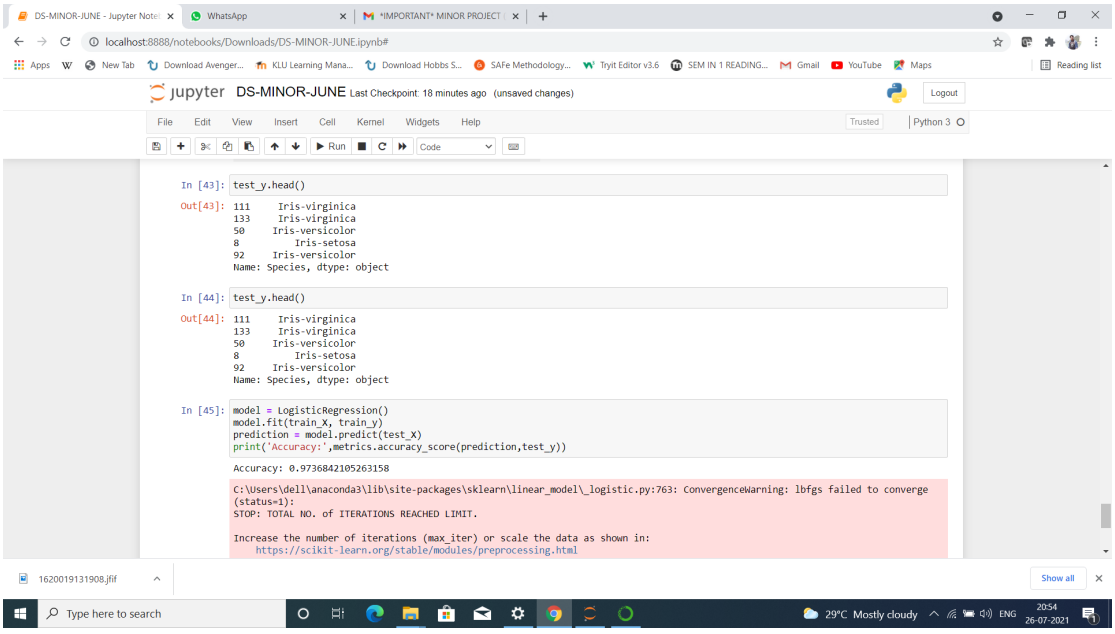

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In [43]:
```
test_y.head()
```

Out[43]:
```
111     Iris-virginica
133     Iris-virginica
50     Iris-versicolor
8          Iris-setosa
92     Iris-versicolor
Name: Species, dtype: object
```

In [44]:
```
test_y.head()
```

Out[44]:
```
111     Iris-virginica
133     Iris-virginica
50     Iris-versicolor
8          Iris-setosa
92     Iris-versicolor
Name: Species, dtype: object
```

In [45]:
```
model = LogisticRegression()
model.fit(train_X, train_y)
prediction = model.predict(test_X)
print('Accuracy:',metrics.accuracy_score(prediction,test_y))
```

```
Accuracy: 0.9736842105263158
```

```
C:\Users\dell\anaconda3\lib\site-packages\sklearn\linear_model\_logistic.py:763: ConvergenceWarning: lbfgs failed to converge
(status=1):
STOP: TOTAL NO. of ITERATIONS REACHED LIMIT.

Increase the number of iterations (max_iter) or scale the data as shown in:
    https://scikit-learn.org/stable/modules/preprocessing.html
```

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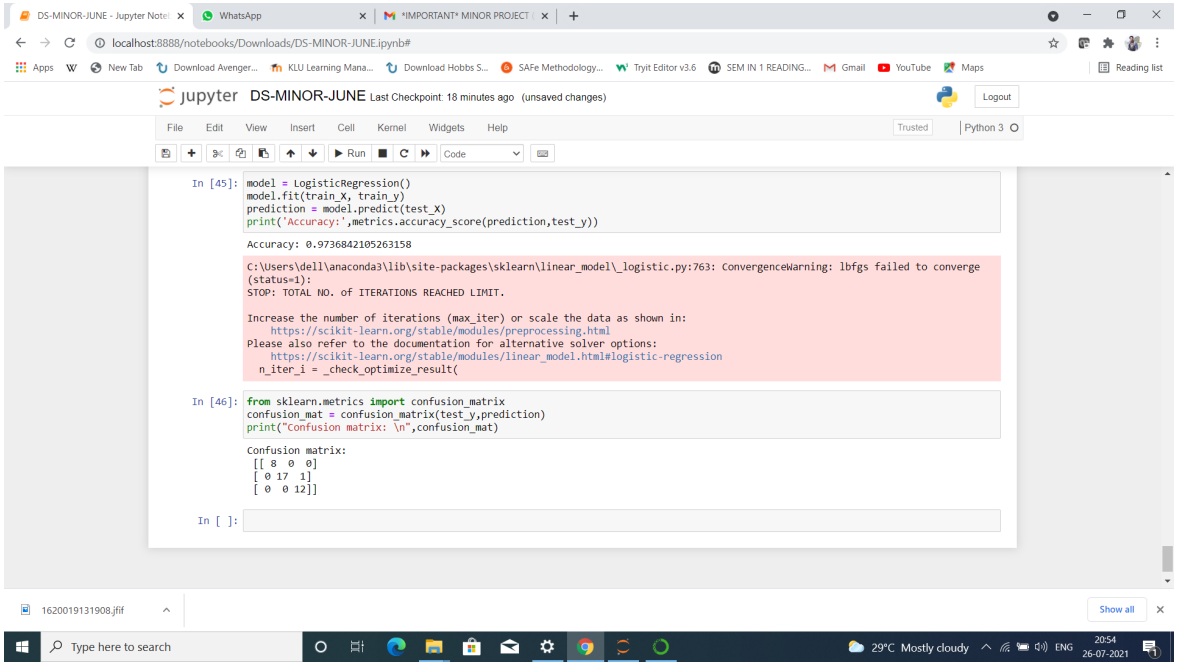

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