
**SCHOOL OF COMPUTER ENGINEERING AND TECHNOLOGY**

# Active Learning

**Data Science**

# Active Learning

## Group Members


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## Faculty

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# Problem Statement

Perform the following data visualization operation on

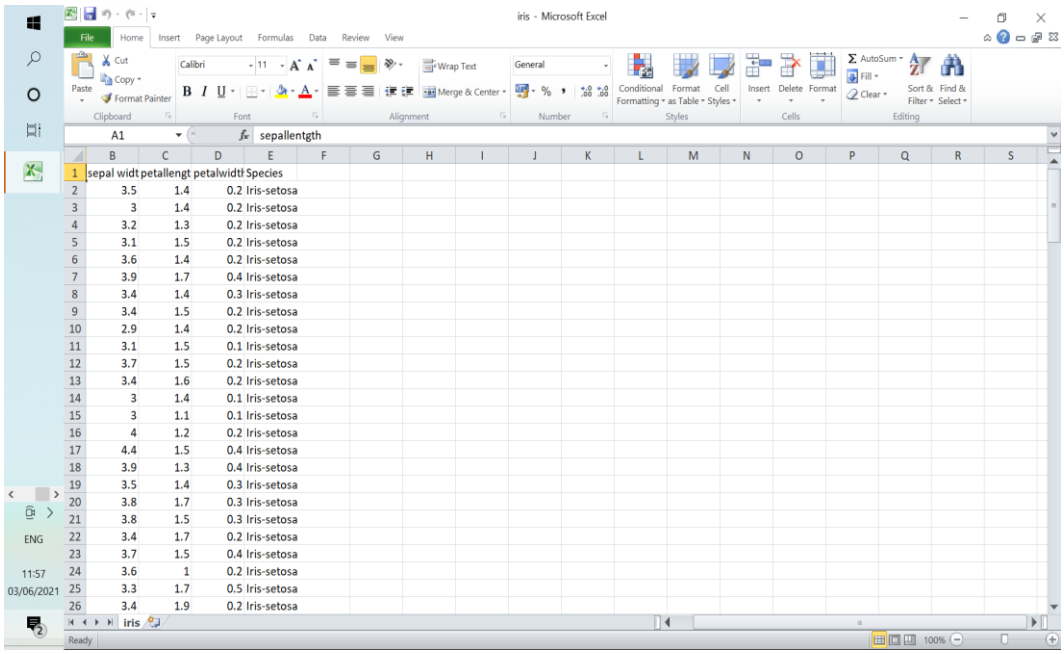
IRIS data set.

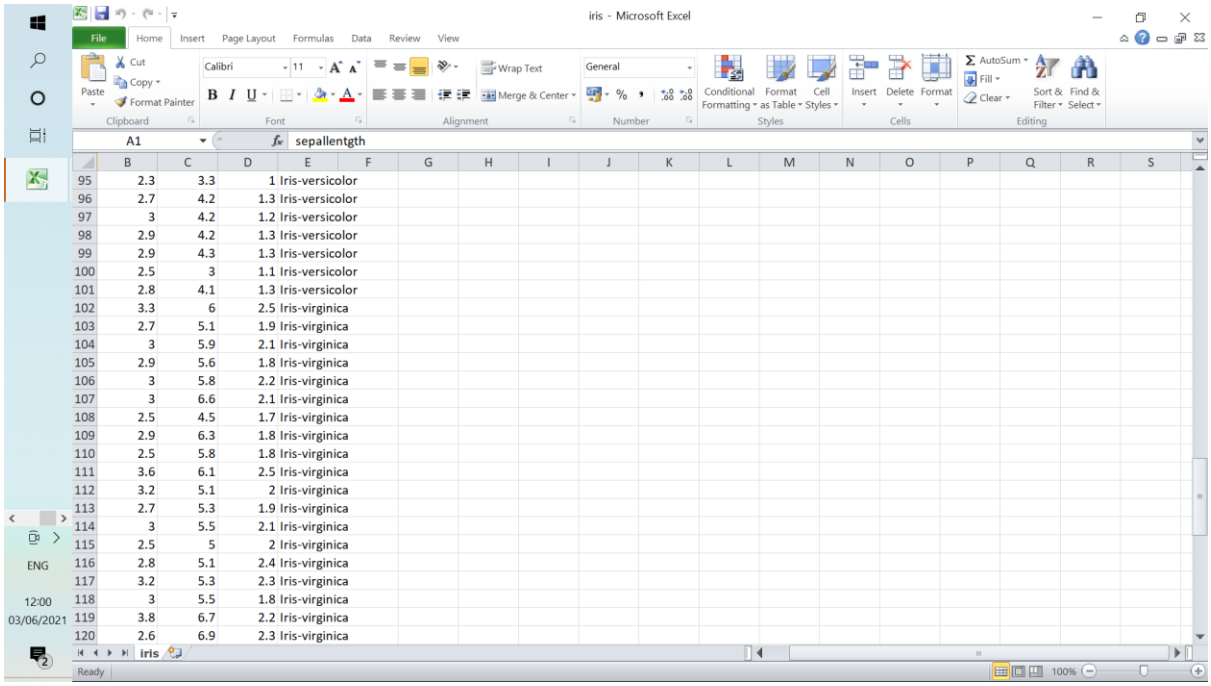
Use ploty to plot following graph

- Line
- Bar
- Box
- Scatter
- ML graph

# Details of dataset used : (with snapshots):

We are using IRIS data set which has 150 rows and 5 columns. The Columns names are sepallentgth, sepal width, petallength , petalwidth & Species.




iris - Microsoft Excel
File
Home
Insert
Page Layout
Formulas
Data
Review
View
Paste
Cut
Copy
Format Painter
Calibri
11
Wrap Text
General
Merge & Center
Conditional Formatting
Format as Table
Cell Styles
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AutoSum
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Clear
Sort & Filter
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Font
Alignment
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A1
sepallentgth
B C D E F G H I J K L M N O P Q R S
95 2.3 3.3 1 Iris-versicolor
96 2.7 4.2 1.3 Iris-versicolor
97 3 4.2 1.2 Iris-versicolor
98 2.9 4.2 1.3 Iris-versicolor
99 2.9 4.3 1.3 Iris-versicolor
100 2.5 3 1.1 Iris-versicolor
101 2.8 4.1 1.3 Iris-versicolor
102 3.3 6 2.5 Iris-virginica
103 2.7 5.1 1.9 Iris-virginica
104 3 5.9 2.1 Iris-virginica
105 2.9 5.6 1.8 Iris-virginica
106 3 5.8 2.2 Iris-virginica
107 3 6.6 2.1 Iris-virginica
108 2.5 4.5 1.7 Iris-virginica
109 2.9 6.3 1.8 Iris-virginica
110 2.5 5.8 1.8 Iris-virginica
111 3.6 6.1 2.5 Iris-virginica
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113 2.7 5.3 1.9 Iris-virginica
114 3 5.5 2.1 Iris-virginica
115 2.5 5 2 Iris-virginica
116 2.8 5.1 2.4 Iris-virginica
117 3.2 5.3 2.3 Iris-virginica
118 3 5.5 1.8 Iris-virginica
119 3.8 6.7 2.2 Iris-virginica
120 2.6 6.9 2.3 Iris-virginica
iris
Ready
100%
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12:00
03/06/2021

# Screenshots of work done:

## DS ACTIVE LEARNING GROUP - 12

In [84]:
```
pip install plotly
```

```
Requirement already satisfied: plotly in c:\programdata\anaconda3\lib\site-packages (4.12.
0)
Requirement already satisfied: six in c:\programdata\anaconda3\lib\site-packages (from plo
tly) (1.15.0)
Requirement already satisfied: retrying>=1.3.3 in c:\programdata\anaconda3\lib\site-packag
es (from plotly) (1.3.3)
Note: you may need to restart the kernel to use updated packages.
```

In [1]:
```
import pandas as pd
import numpy as np
import plotly.graph_objects as go
```

In [2]:
```
df=pd.read_csv('iris.csv')
df.rename(columns = {'sepal width' : 'sepalwidth'}, inplace = True)
```

In [3]:
```
df.head()
df['Species'].unique()
```

Out[3]:
```
array(['Iris-setosa', 'Iris-versicolor', 'Iris-virginica'], dtype=object)
```

In [4]:
```
df.isnull().sum()
```

Out[4]:
```
sepallentgth    0
sepalwidth      0
petallength     0
petalwidth      0
Species         0
dtype: int64
```

In [5]:
```
df.shape
```

Out[5]:
```
(150, 5)
```

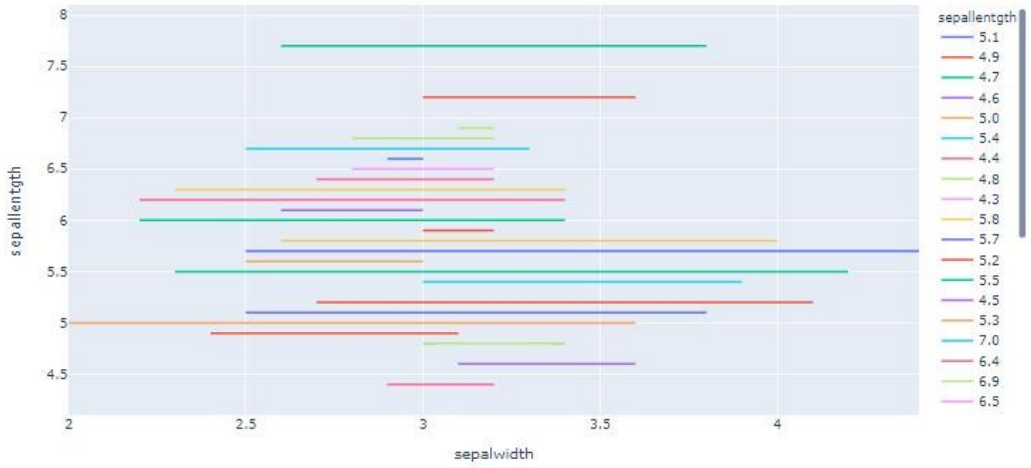
In [6]:
```
df.describe()
```

Out[6]:

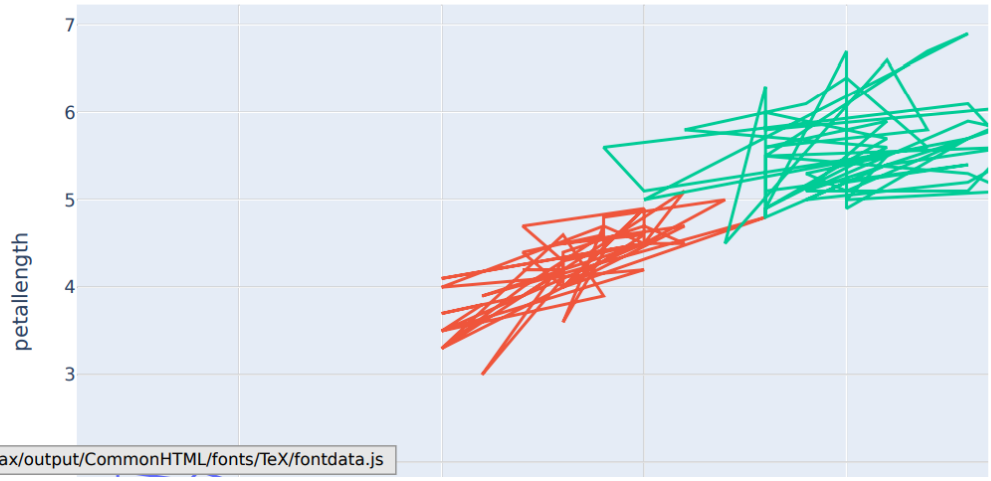
| | sepallentgth | sepalwidth | petallength | petalwidth |
|---|---|---|---|---|
| **count** | 150.000000 | 150.000000 | 150.000000 | 150.000000 |
| **mean** | 5.843333 | 3.054000 | 3.758667 | 1.198667 |
| **std** | 0.828066 | 0.433594 | 1.764420 | 0.763161 |
| **min** | 4.300000 | 2.000000 | 1.000000 | 0.100000 |
| **25%** | 5.100000 | 2.800000 | 1.600000 | 0.300000 |
| **50%** | 5.800000 | 3.000000 | 4.350000 | 1.300000 |
| **75%** | 6.400000 | 3.300000 | 5.100000 | 1.800000 |
| **max** | 7.900000 | 4.400000 | 6.900000 | 2.500000 |

## Line plot

In [7]:
```
import plotly.express as px
fig = px.line(df, x = "sepalwidth",
              y = "sepallentgth" ,
              color = "sepallentgth")
fig.show()
```




In [8]:
```
fig = px.line(df, x = "petalwidth",
              y = "petallength" ,
              color = "Species")
fig.show()
```

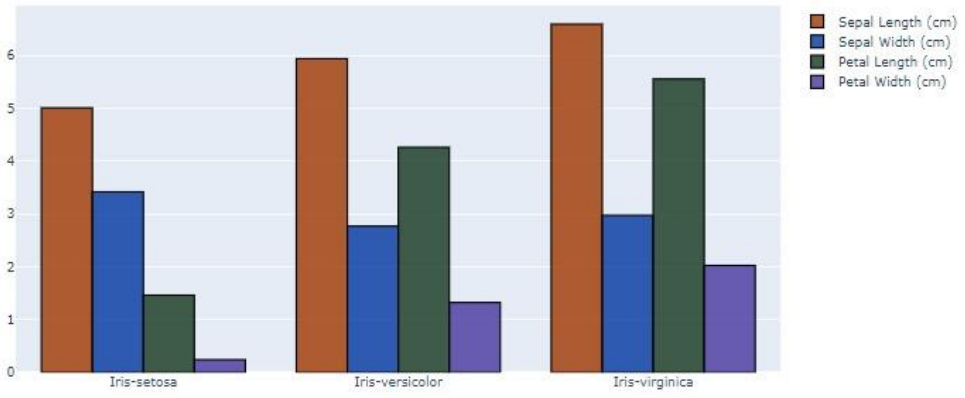


# Bar graph

In [9]:

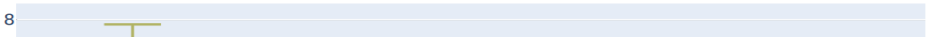
```
from plotly.offline import init_notebook_mode, iplot

d1 = df.groupby(df.Species).mean()
d1['Species'] = d1.index

t1 = go.Bar(
            x = d1.Species,
            y = d1.sepallentgth,
            name = "Sepal Length (cm)",
            marker = dict(color = 'rgba(160, 55, 0, 0.8)', line = dict(color = 'rgb(0,0,0
            text = d1.Species
)

t2 = go.Bar(
            x = d1.Species,
            y = d1.sepalwidth,
            name = "Sepal Width (cm)",
            marker = dict(color = 'rgba(0, 55, 160, 0.8)', line = dict(color = 'rgb(0,0,0
            text = d1.Species
)

t3 = go.Bar(
            x = d1.Species,
            y = d1.petallength,
            name = "Petal Length (cm)",
            marker = dict(color = 'rgba(20, 55, 30, 0.8)', line = dict(color = 'rgb(0,0,0
            text = d1.Species
)

t4 = go.Bar(
            x = d1.Species,
            y = d1.petalwidth,
            name = "Petal Width (cm)",
            marker = dict(color = 'rgba(70, 55, 160, 0.8)', line = dict(color = 'rgb(0,0,
            text = d1.Species
)
```

```
            y = d1.petalwidth,
            name = "Petal Width (cm)",
            marker = dict(color = 'rgba(70, 55, 160, 0.8)', line = dict(color = 'rgb(0,0,0)', width = 1.5)),
            text = d1.Species
)

b = [t1,t2,t3,t4]
layout_bar = go.Layout(barmode = "group")
fig_bar = go.Figure(data = b, layout = layout_bar)
iplot(fig_bar)
```



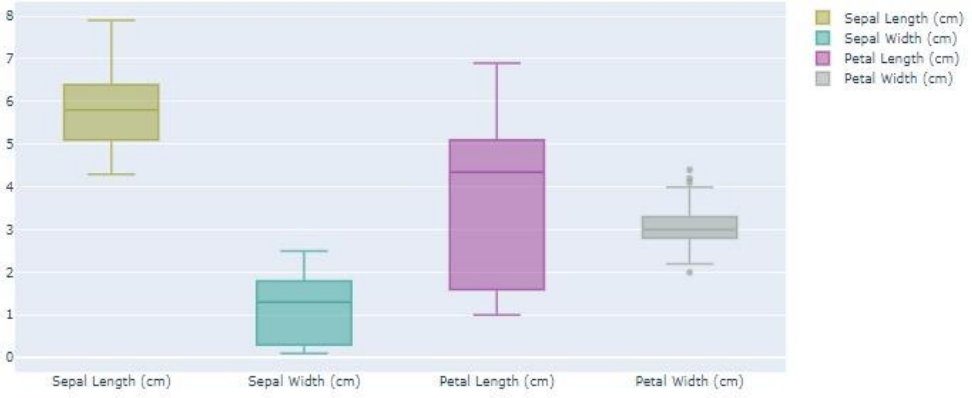
# Box plot

In [10]:
```
t1_box = go.Box(
                name = 'Sepal Length (cm)',
                y = df.sepallentgth,
                marker = dict(color = 'rgba(160,160,50,0.7)')
)

t2_box = go.Box(
                name = 'Sepal Width (cm)',
                y = df.petalwidth,
                marker = dict(color = 'rgba(50,160,150,0.7)')
)

t3_box = go.Box(
                name = 'Petal Length (cm)',
                y = df.petallength,
                marker = dict(color = 'rgba(160,60,150,0.7)')
)

t4_box = go.Box(
                name = 'Petal Width (cm)',
                y = df.sepalwidth,
                marker = dict(color = 'rgba(150,160,150,0.7)')
)

fig_box = [t1_box, t2_box, t3_box, t4_box]

iplot(fig_box)
```





```
                marker = dict(color = 'rgba(160,60,150,0.7)')
)

t4_box = go.Box(
                name = 'Petal Width (cm)',
                y = df.sepalwidth,
                marker = dict(color = 'rgba(150,160,150,0.7)')
)

fig_box = [t1_box, t2_box, t3_box, t4_box]

iplot(fig_box)
```

## Scatter plot

In [11]:

```
S_SW = go.Scatter(
                    x = df.sepalwidth,
                    y = df.sepallentgth,
                    mode = "markers",
                    name = "Sepal Width (cm)",
                    marker = dict(color = 'rgba(255, 0, 0, 0.9)'),
                    text = df.Species
)

S_PL = go.Scatter(
                    x = df.petallength,
                    y = df.sepallentgth,
                    mode = "markers",
                    name = "Petal Length (cm)",
                    marker = dict(color = 'rgba(0, 255, 0, 0.9)'),
                    text = df.Species
)

S_PW = go.Scatter(
                    x = df.petalwidth,
                    y = df.sepallentgth,
                    mode = "markers",
                    name = "Petal Width (cm)",
                    marker = dict(color = 'rgba(0, 0, 255, 0.9)'),
                    text = df.Species
)

layout = dict(title = 'Change of Sepal Length by Other Properties',
              xaxis= dict(title= 'centimeters',ticklen= 5,zeroline= False)
             )
u = [S_SW, S_PL,S_PW]
fig = dict(data = u)
iplot(fig)
```

```
             )
u = [S_SW, S_PL,S_PW]
fig = dict(data = u)
iplot(fig)
```

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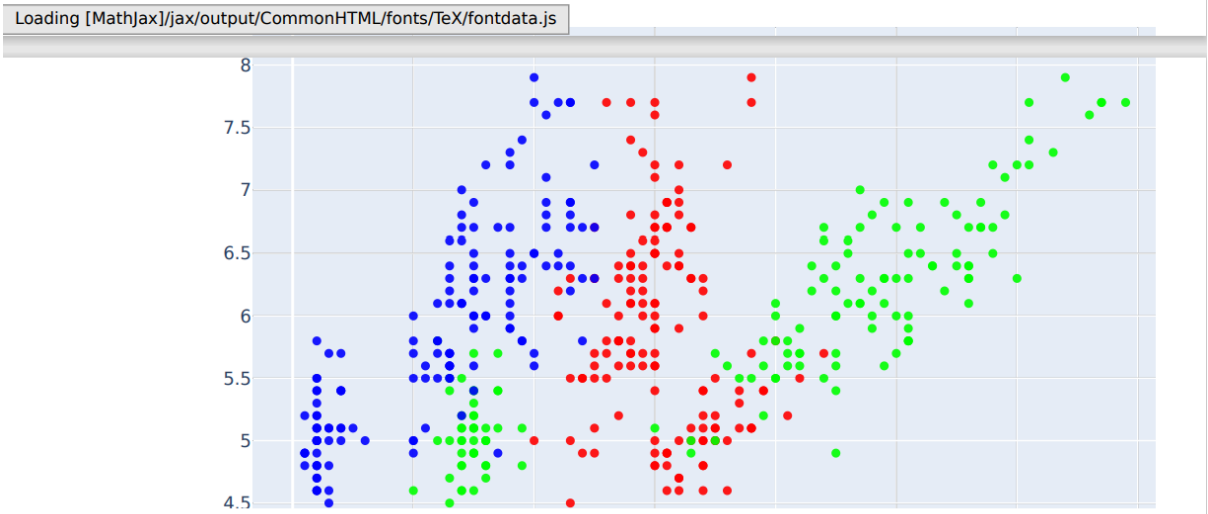
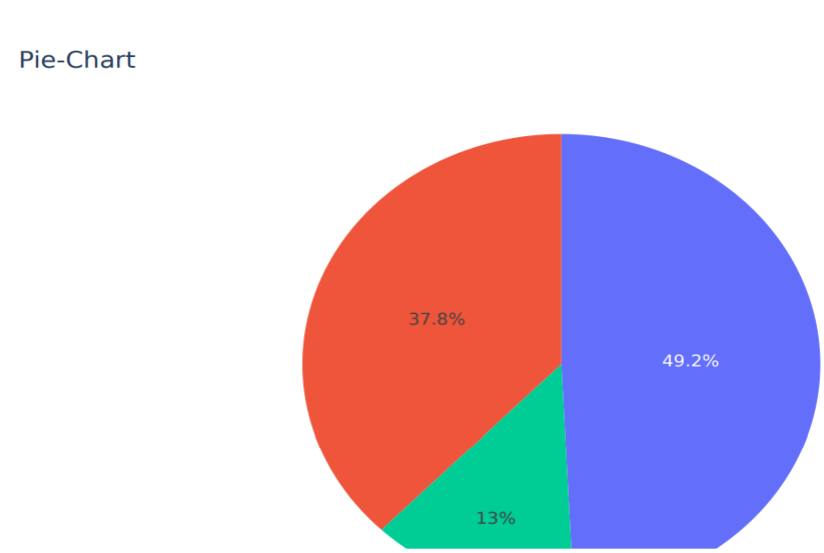


# ML graph

## Pie chart

In [12]:
```
fig = px.pie(df, values='petallength', names='Species', title='Pie-Chart')
fig.show()
```

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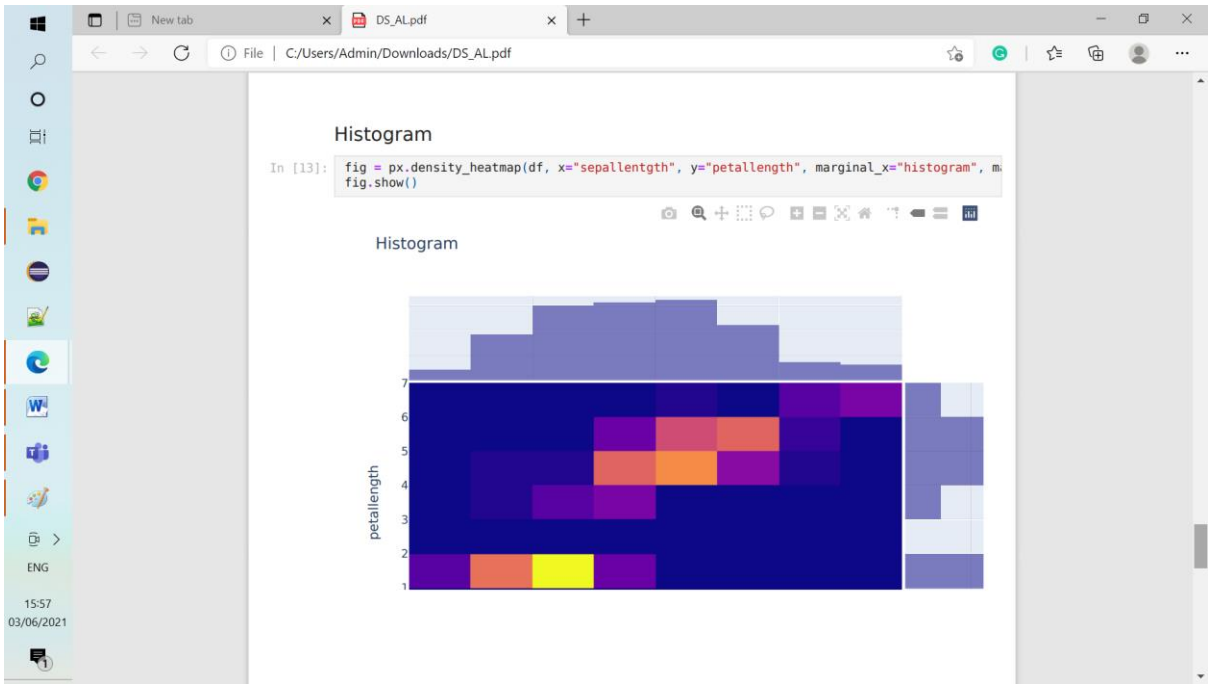
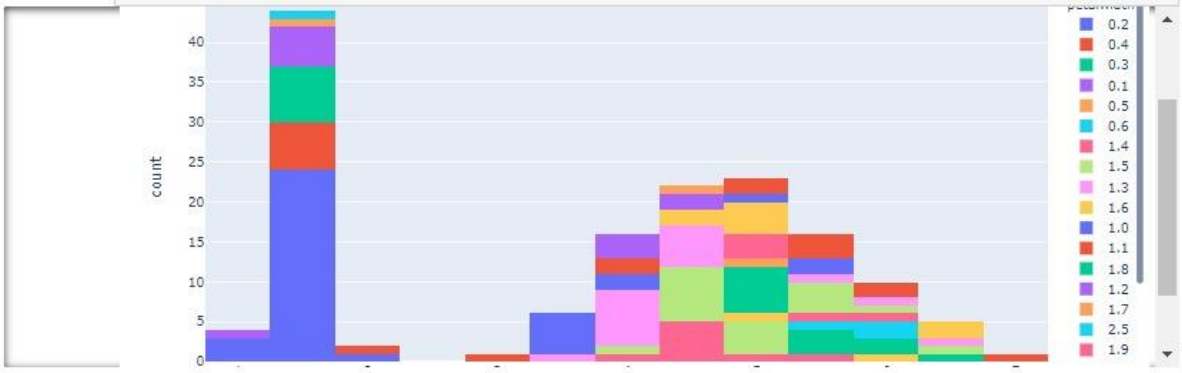
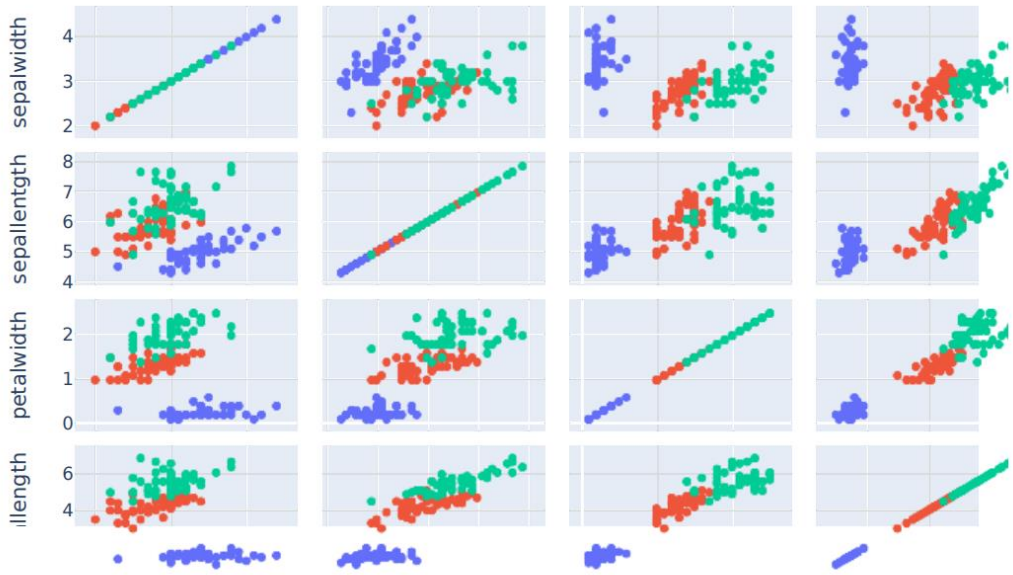


In [14]:
```
fig = px.histogram(df, x="petallength", color="petalwidth", title='Histogram')
fig.show()
```




## Pair plot

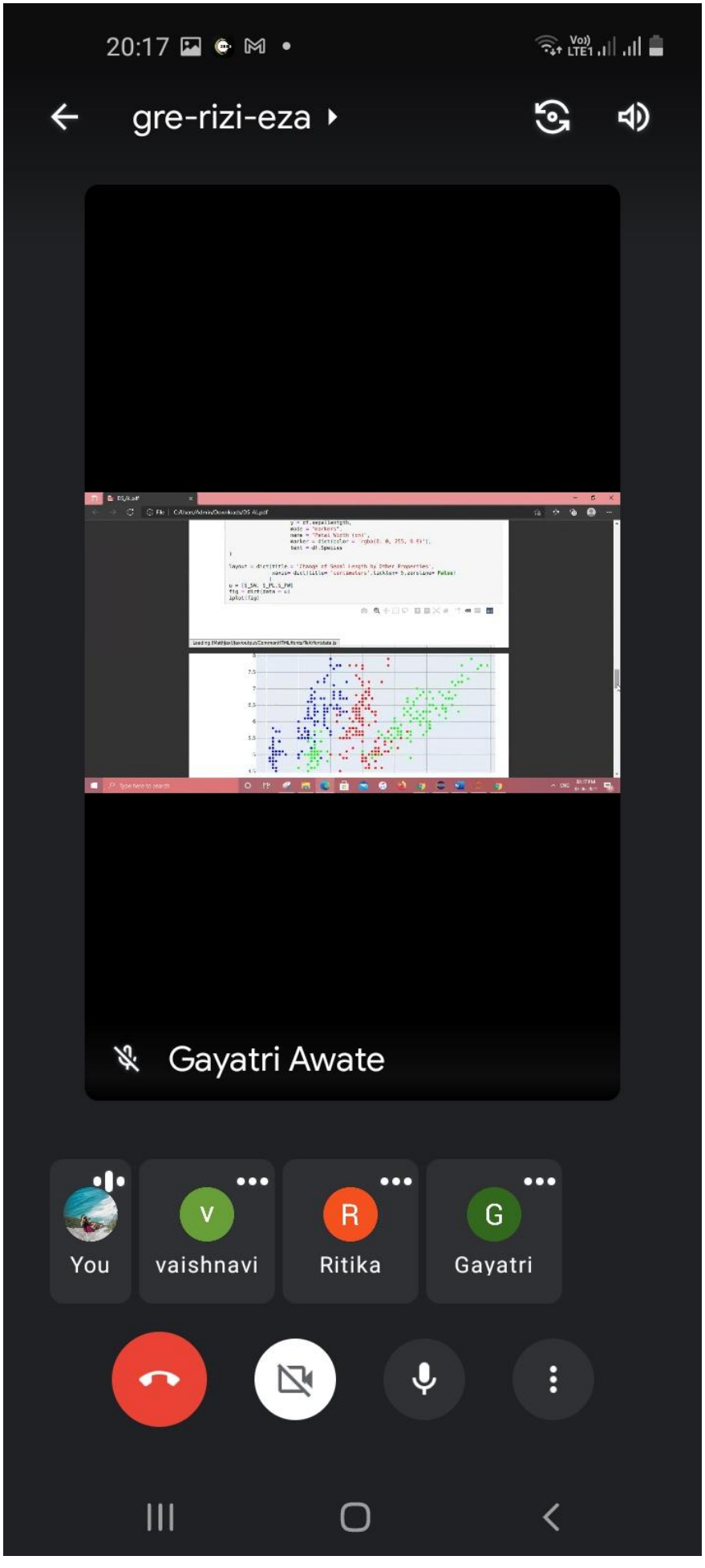
In [15]:
```
fig = px.scatter_matrix(df,dimensions=["sepalwidth", "sepallentgth", "petalwidth", "petal
    color="Species")
fig.show()
```

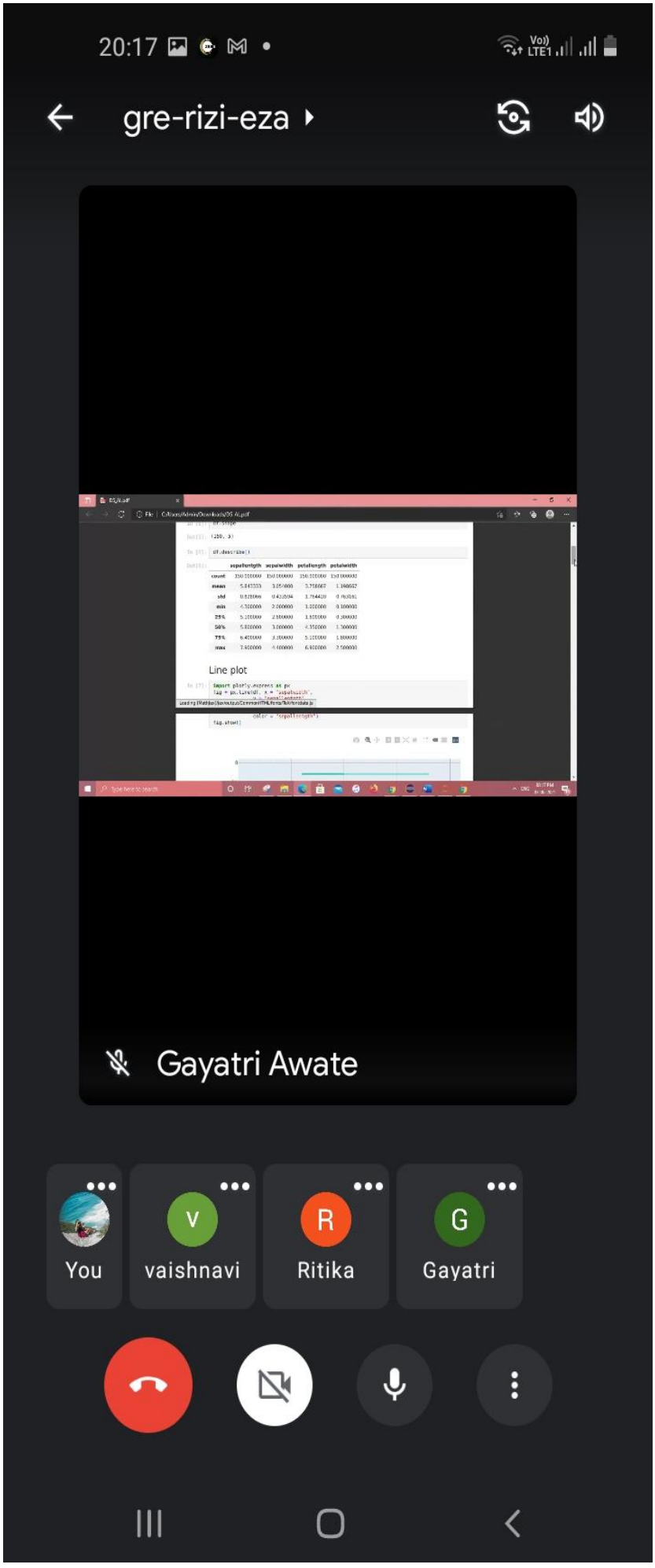


## Observation & Inferences

We have used **Plotly Python** library which is an interactive, open-source plotting library that supports over 40 unique chart types covering a wide range of statistical, financial, geographic, scientific, and 3-dimensional use-cases. Using Ploty Library we have plotted Line , Box , Bar ,Scatter, ML graph

## Screenshot of group activity


20:17
gre-rizi-eza
Gayatri Awate
You
vaishnavi
Ritika
Gayatri


20:17
gre-rizi-eza
Line plot
Gayatri Awate
You
vaishnavi
Ritika
Gayatri

## Conclusion

Thus , we have successfully plotted Line ,Box , Bar ,Scatter, ML graphs using Plotly Library.