**DATA VISUALIZATION** Data: iris.csv SET A In [2]: #Q1. from matplotlib import pyplot as plt import numpy as np # generate random array using NumPy a1 = np.random.randn(50)a2 = np.random.randn(50) plt.plot(a1,color="k",linewidth=1,linestyle=':') plt.title("Line Chart") plt.show() Line Chart 2 1 0 -1-2 10 20 30 40 50 In [3]: plt.scatter(a1,a2,c=np.random.randn(50) ,marker ='\*' ,alpha = 0.9)plt.title("Scatter Plot") plt.show() Scatter Plot 2 1 0 -1-2 In [4]: plt.hist(a2,bins=15,facecolor ='lawngreen',edgecolor = "k",alpha=0.7) print("Histogram") Histogram 8 7 6 5 4 2 1 In [5]: box=plt.boxplot(a2, vert=False, patch artist = True) print("Boxplot") Boxplot -2 In [6]: #Q2. a3=np.append(a2,[[5,-4]]) plt.boxplot(a3, vert=False) print("Boxplot with outliers") plt.show() Boxplot with outliers In [7]: from matplotlib import pyplot as plt import numpy as np subjects=['English','Comp Sci','Maths','Physics','Statistics','Algebra','Mechanics'] marks = [45, 74, 62, 31, 21, 87, 95]plt.pie(marks,labels = subjects,autopct='%1.1f%%') print("Pie Plot") plt.show() Pie Plot Comp Sci Maths 17.8% 14.9% English 10.8% Physics 5.1% Statistics 22.9% 21.0% Mechanics Algebra In [8]: print("Bar Plot") bar=plt.bar(subjects, marks, color='g') def gradientbars(bars): grad = np.atleast\_2d(np.linspace(0,1,256)).T ax = bars[0].axeslim = ax.get xlim()+ax.get ylim() for bar in bars: bar.set\_zorder(1) bar.set facecolor("none") x,y = bar.get xy()w, h = bar.get\_width(), bar.get\_height() ax.imshow(grad, extent=[x,x+w,y,y+h], aspect="auto", zorder=0) ax.axis(lim) gradientbars(bar) plt.show() Bar Plot 80 60 40 20 English Comp Sci Maths Physics Statistics AlgebraMechanics In [14]: #Q4. Data.csv import pandas as pd import seaborn as sns import matplotlib.pyplot as plt data=pd.read\_csv("C:\\iris.csv") sns.countplot(x='variety',data = data) plt.title("Iris Species Count") plt.show() Iris Species Count 50 40 20 10 0 Setosa Versicolor Virginica variety In [15]: #Q5. import pandas as pd import seaborn as sns import matplotlib.pyplot as plt data=pd.read\_csv("C:\\iris.csv") ax=plt.subplots(1,1,figsize=(10,8)) data['variety'].value counts().plot.pie(explode=[0.1,0.1,0.1], autopct='%1.1f%%', shadow=True, figsize=(10,8)) plt.title("Iris Species %") plt.show() Iris Species % Setosa 33.3% Versicellor 33.3% 33.3% Virginica In [16]: #Q6. import seaborn as sns iris\_setosa=data.loc[data["variety"]=="Setosa"] iris\_virginica=data.loc[data["variety"]=="Virginica"] iris\_versicolor=data.loc[data["variety"]=="Versicolor"] sns.FacetGrid(data, hue="variety").map(sns.histplot, "petal.length").add legend() sns.FacetGrid(data,hue="variety").map(sns.histplot,"petal.width").add\_legend() sns.FacetGrid(data, hue="variety").map(sns.histplot, "sepal.length").add\_legend() sns.FacetGrid(data,hue="variety").map(sns.histplot,"sepal.width").add\_legend() plt.show() 14 12 10 Count variety 8 6 Versicolor Virginica 4 2 petal.length 30 25 20 Count 15 Setosa Versicolor 10 Virginica 5 petal.width 15.0 12.5 10.0 8 7.5 variety Setosa Versicolor 5.0 Virginica 2.5 0.0 sepal.length 15.0 12.5 10.0 Count Setosa 7.5 Versicolor 5.0 Virginica 2.5 0.0 3 sepal.width **SET B** In [17]: #Q1. import pandas as pd import matplotlib.pyplot as plt data=pd.read\_csv("C:\\iris.csv") fig = data[data.variety=='Setosa'].plot.scatter(x='petal.length',y='petal.width',color='cyan', label='Setosa') data[data.variety=='Versicolor'].plot.scatter(x='petal.length',y='petal.width',color='violet', label='versicological.com' data[data.variety=='Virginica'].plot.scatter(x='petal.length',y='petal.width',color='lawngreen', label='virgini fig.set\_xlabel("Petal Length") fig.set ylabel("Petal Width") fig.set title(" Petal Length VS Width") fig=plt.gcf() fig.set\_size\_inches(12,8) plt.show() Petal Length VS Width Setosa versicolor virginica 2.0 1.5 Petal Width 1.0 0.5 ż з Ś 6 Petal Length In [2]: #Q2. import pandas as pd import matplotlib.pyplot as plt data=pd.read csv("C:\\Users\\farhe\\Downloads\\Datasets\\iris.csv") fig = data[data.variety=='Setosa'].plot.scatter(x='sepal.length',y='sepal.width',color='g', label='Setosa') data[data.variety=='Versicolor'].plot.scatter(x='sepal.length',y='sepal.width',color='r', label='versicolor',ax data[data.variety=='Virginica'].plot.scatter(x='sepal.length',y='sepal.width',color='gold', label='virginica', fig.set xlabel("Sepal Length") fig.set ylabel("Sepal Width") fig.set\_title(" Sepal Length VS Width") fig=plt.gcf() fig.set\_size\_inches(12,8) plt.show() Sepal Length VS Width 4.5 Setosa versicolor virginica 4.0 3.5 Sepal Width 3.0 2.5 2.0 7.0 4.5 5.0 5.5 6.0 6.5 7.5 8.0 Sepal Length In [19]: #Q3. import seaborn as sns import matplotlib.pyplot as plt def graph(a): sns.boxplot(x="variety", y=a, data=data) plt.figure(figsize=(10,10)) plt.subplot(221) graph('sepal.length') plt.subplot(222) graph('sepal.width') plt.subplot(223) graph('petal.length') plt.subplot(224) graph('petal.width') plt.show() 4.5 8.0 7.5 4.0 sepal.width 3.0 3.5 6.5 sepal.length 6.0 5.5 2.5 5.0 4.5 2.0 Setosa Setosa Virginica Versicolor Virginica Versicolor variety variety 7 2.5 6 2.0 5 petal.width petal.length 2 0.5 0.0 Versicolor Virginica Virginica Setosa Versicolor variety variety **SET C** In [20]: #Q1. #Plot to compare all features of iris dataset import pandas as pd import seaborn as sns import matplotlib.pyplot as plt data=pd.read\_csv("C:\\iris.csv") sns.pairplot(data,hue='variety', height=2) plt.show() sepal.length 4.5 4.0 sepal.width 3.5 3.0 2.5 2.0 variety Setosa Versicolor 6 Virginica petal.length 2.5 2.0 petal.width 0.5 0.0 8 0 8 sepal.width petal.length petal.width sepal.length In [21]: #Q2. import numpy as np import seaborn as sns import matplotlib.pyplot as plt plt.figure(figsize=(10,10)) plt.subplot(221) sns.boxplot(x="variety", y="sepal.length", data=data,palette="bwr"); plt.subplot(222) sns.boxplot(x="variety", y="sepal.width", data=data,palette="magma") plt.subplot(223) sns.boxplot(x="variety", y="petal.length", data=data,palette="autumn") plt.subplot(224) sns.boxplot(x="variety", y="petal.width", data=data,palette="GnBu") plt.show() 8.0 7.5 4.0 7.0 sepal.width 3.0 3.5 6.5 sepal.length 6.0 5.5 2.5 5.0 4.5 2.0 Versicolor Versicolor Setosa Virginica Setosa Virginica variety variety 2.5 6 2.0 5 petal.width petal.length 3 2 0.5 1 0.0 Virginica Setosa Versicolor Virginica Setosa Versicolor variety variety In [23]: #Q3. import pandas as pd import seaborn as sns import matplotlib.pyplot as plt data=pd.read\_csv("C:\\iris.csv") g = sns.jointplot(x="sepal.length", y="sepal.width", shade=True, data=data, kind="kde", color="b") g.plot\_joint(plt.scatter, c="gold", s=40, linewidth=1, marker="\*") g.ax\_joint.collections[0].set\_alpha(0) g.set\_axis\_labels("\$SepalLength\$", "\$SepalWidth\$") plt.show() 4.5 4.0 3.5 SepalWidth 5 6 1 3.0 2.5 2.0 1.5 SepalLength THE END