

**Department of Computer Science and Engineering**

**29th Batch**

**Lab Report 6**

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| Course title | : Artificial Intelligence Lab |
| Course Code | : CSE - 414 |

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* **Question: Data processing with pandas, scikit-learn, seaborn, matplotlib and implement 7 plots.**
* **Solution(Code & Output):**

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| import pandas as pd  from sklearn.datasets import load\_iris  import seaborn as sns  import matplotlib.pyplot as plt  **#Load Data**  iris = load\_iris()  print(iris)  iris.feature\_names  iris.data  df = pd.DataFrame(iris.data, columns=iris.feature\_names)  df['species'] = iris.target  df.head(10)  df.info()  df.shape  df.columns  df.describe()  print(df['species'].value\_counts()) |  |

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| **Box Plot:**  plt.figure(figsize=(15,10))  sns.boxplot(data=df, orient='h')  plt.title("Box Plot")  Shows data spread, median, and outliers across multiple variables. It's useful for comparing distributions side by side. |  |
| **Histogram:**  df.hist(figsize=(10,6))  plt.title('Histogram')  plt.show()  visualizes how often values occur within set ranges (bins),  showing distribution shape like skewness or modality. |  |

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| **Bar Plot:**  plt.figure(figsize=(15,10))  sns.boxplot(data=df, orient='h')  plt.title("Box Plot")  shows the mean (or another aggregation) of data for each category, with optional error bars. |  |

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| **Pair Plot:**  sns.pairplot(df,hue='species')  plt.title(pair Plot')  plt.show()  Pair Plot creates a grid of scatter plots for each variable pair, useful for  spotting trends or clustering |  |

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| **Violin Plot:**  sns.violinplot(df)  plt.title('violin Plot')  plt.show()  Violin Plot merges a box plot with a density plot, showing distribution shape and summary stats across categories. |  |

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| **Scatter Plot:**  sns.scatterplot(x='sepal length (cm)', y='sepal width (cm)', data=df)  plt.title("Scatter Plot")  plt.show()  displays the relationship between two numeric variables. Adding color (hue) helps distinguish categories like species. |  |

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| **Count Plot:**  sns.countplot(df)  plt.title('count Plot')  plt.show()  Shows data spread, median, and outliers across multiple variables. It's useful for comparing distributions side by side. |  |

* **Conclusion:**

In this lab, I learned how to visualize data using different types of plots. It helped me understand patterns and relationships in the dataset more clearly. I practiced using pandas, seaborn, matplotlib, and scikit-learn for data analysis and visualization.