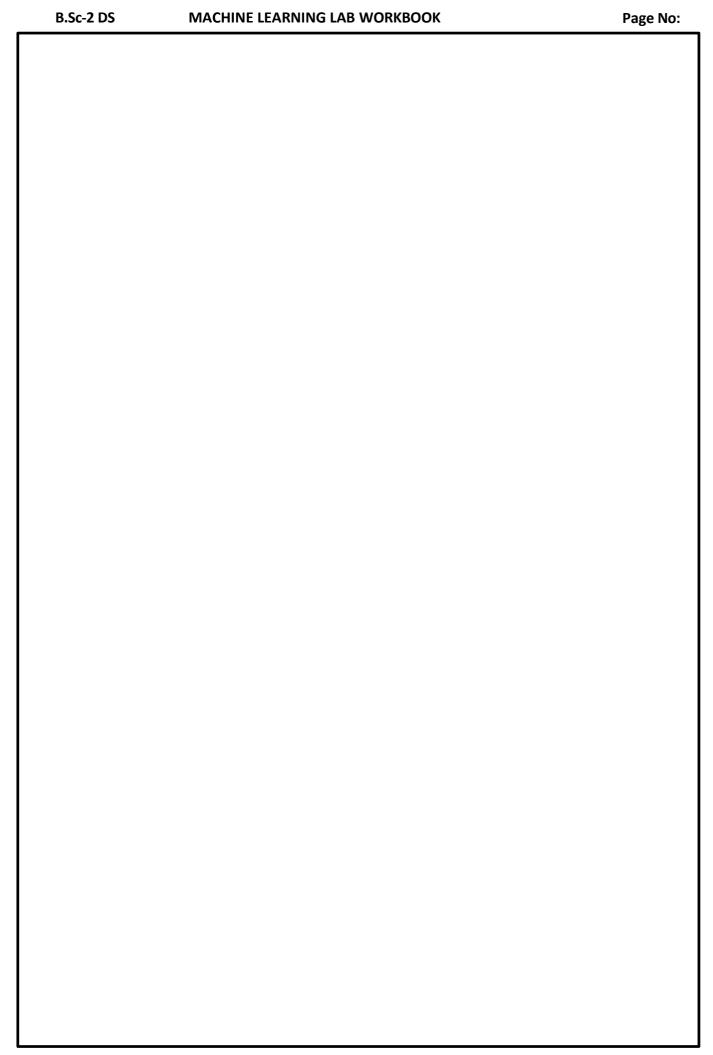| WEEK -1	Lab Exercise Programs	DATE:
1. Write a program to perform basic array operations using NumPy? 2. Write a program to perform linear algebra operations (like matrix multiplication) using NumPy? 3. Write a program to clean and preprocess data using Pandas (handling missing values, removing duplicates, etc.)? 4. Write a Python program to load the csv file data into dataframe and print dataframe. 5. Write a program to analyze and manipulate time series data using Pandas? 6. Write a program to aggregate data using the Pandas groupby function?		**LAB FACULTY SIGN:** **CLASS FACULTY SIGN:**

WEEK -2	Lab Exercise Programs	DATE:
7. Write a program to create and visualize a histogram using Matplotlib? 8. Write a program to plot a line graph to show trends over time with Matplotlib? 9. Write a program to create a scatter plot to visualize the relationship between two variables using Matplotlib? 10. Write a program to use Seaborn's pairplot for exploratory data analysis? 11. Write a program to create a boxplot to visualize the distribution of numerical data with Seaborn? **Assessment**: Write a program to convert the values in column A to a NumPy array and perform element-wise multiplication with the values in column B of the DataFrame, then add the result as a new column C in the DataFrame. df = pd.DataFrame({'A': [1, 2, 3, 4, 5], &{'B': [6, 7, 8, 9, 10]}).	**LAB FACULTY SIGN:** **CLASS FACULTY SIGN:**

WEEK -3	Lab Exercise Programs	DATE:
12. Write a program to create a heatmap to visualize data intensity or correlations using Seaborn? 13. Write a program to plot a bar chart to compare categories of data with Seaborn? 14. Write a program to create a pie chart to represent proportions of categories in a dataset with Matplotlib? 15. Write a program to create a stacked bar chart to show composition of categories in a dataset with Matplotlib? 16. Write a program to plot a normal distribution curve and add a Kernel Density Estimate (KDE) using Seaborn? 17. Write a program to create a grid of subplots to display multiple visualizations in a single figure using Matplotlib?		**LAB FACULTY SIGN:** **CLASS FACULTY SIGN:**

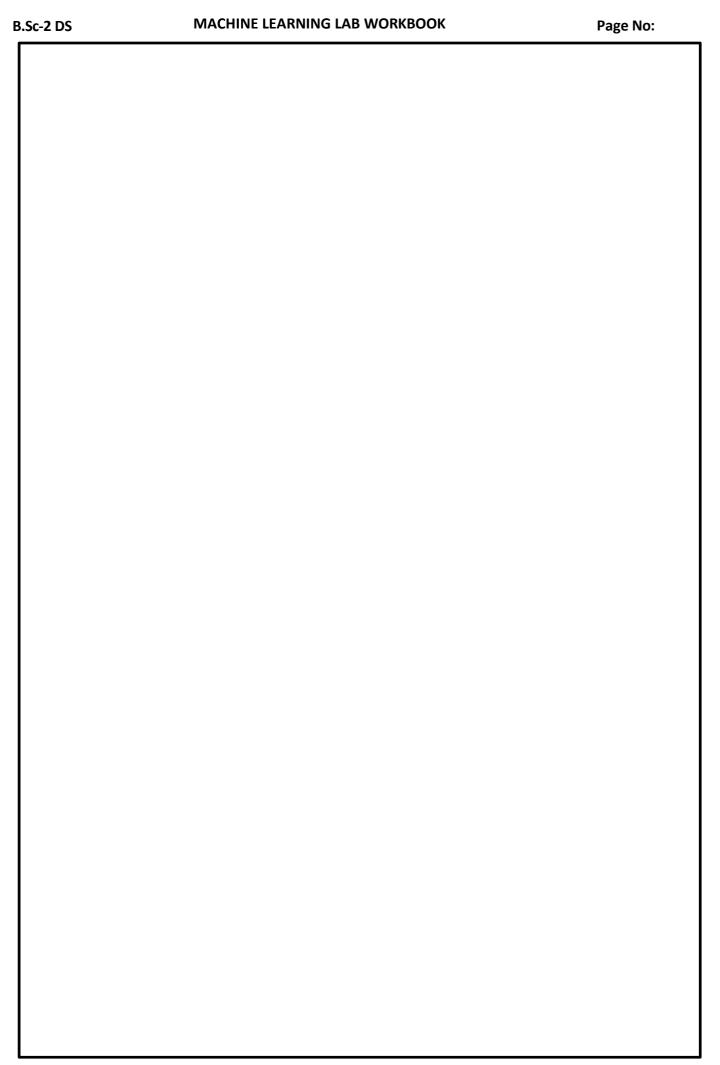| WEEK -4	Lab Exercise Programs	DATE:
18. Write a program to visualize the correlation matrix of a dataset with a heatmap in Seaborn? 19. Write a program to apply data aggregation and summarization using pivot tables inPandas? 20. Write a program to sort and filter data based on certain conditions using Pandas? 21. Write a program to plot multiple lines or scatter plots on the same axis to compare different datasets in Matplotlib? **Assessment:** Write a program to create a 3D scatter plot using Matplotlib. The dataset should contain random points in 3D		**LAB FACULTY SIGN:** **CLASS FACULTY SIGN:**

WEEK -5	Lab Exercise Programs	DATE:
22. Write a Python program to read the data randomly of 100 samples and split the data into 20% testing data and display it without using sklearn 23. Write a Python program to create dataframe using random data and draw a plot (Clasification) without using sklearn 24. Write a Python program to create dataframe using random data and draw a plot for test data (Clasification) without using sklearn 25. Write a Python program to load csv into dataframe and draw a plot for fiting data (predict) between traing & testing data (Clasification) without using sklearn 26. Split a dataset into 80% training and 20% test sets using Scikit-learn's train_test_split().		**LAB FACULTY SIGN:** **CLASS FACULTY SIGN:**

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WEEK -6	Lab Exercise Programs	DATE:
27. Experiment with different test_size values (e.g., 0.2, 0.3, 0.4) and observe model performance. 28. Use a fixed random_state value for reproducibility when splitting data, and test with different random_state values. 29. Clean and preprocess a dataset (handle missing values, scale features) before splitting into training and test sets. 30. Compare results when applying feature scaling before or after splitting the data. **Assessment**: Write a Python program using Scikit-learn to split the iris dataset into 70% train data and 30% test data. Out of total 150 records, the training set will contain 120 records and the test set contains 30 of those records. Print both datasets	**LAB FACULTY SIGN:** **CLASS FACULTY SIGN:**

WEEK -7	Lab Exercise Programs	DATE:
31. Write a program to classify the Iris dataset using a Decision Tree classifier. 32. Write a program to create and visualize a Decision Tree for the Iris dataset. 33. Write a program to train a Decision Tree classifier on a simple dataset and make predictions. 34. Write a program to handle missing values in a dataset and train a Decision Tree classifier. 35. Write a program to train a Decision Tree classifier on the Breast Cancer dataset and print the accuracy score.		**LAB FACULTY SIGN:** **CLASS FACULTY SIGN:**

WEEK -8	Lab Exercise Programs	DATE:
36. Write down the Procedure for Implementation of KNN using sklearn. 37. Write a program to implement k-Nearest Neighbour algorithm to classify the iris data set. Print both correct and wrong predictions 38. Write a python program to calculate Gini Impurity for the attributes of data set 39. Write a python program to calculate Gini gain values to select the splitting position **Assessment**: Write Python program to use sklearn'sDecisionTreeClassifier to build a decision tree for the sklearn's datasets. Implement functions to find the importance of a split (entropy,information gain, gini measure).		**LAB FACULTY SIGN:** **CLASS FACULTY SIGN:**

WEEK -9	Lab Exercise Programs	DATE:
40. Procedure for Implementation of K-Means using sklearn 41. Write a python program using Scikit-learn for K Means Clustering Algorithm 42. Write a Python program to Implementation of K-Means using sklearn 43. Write a program to apply the K-Means algorithm to the Breast Cancer dataset and visualize the clusters.		**LAB FACULTY SIGN:** **CLASS FACULTY SIGN:**

WEEK -10	Lab Exercise Programs	DATE:
47. Write a program to implement the Perceptron algorithm for binary classification on a simple 2D dataset. 48. Write a program to train a Perceptron on the Iris dataset and make predictions. 49. Write a program to use the Perceptron algorithm to classify emails as spam or not spam using a text dataset. 50. Write a program to train a Perceptron on the Diabetes dataset and predict the outcomes. 51. Write a Python program for breast cancer Wisconsin dataset by using the Naïve Bayes Classifier		**LAB FACULTY SIGN:** **CLASS FACULTY SIGN:**

WEEK -11	Lab Exercise Programs	DATE:
52. Write a Python program to classify text as spam or not spam using the Naïve BayesClassifier 53. Implementation of Gaussian Naive Bayes classifier using scikit-learn 54. Write a python code for backpropagation algorithm. 55. Implement the finite words classification system using Back-propagation algorithm 56. Write a Python program to Sentiment analysis using the Naïve Bayes Classifier. **Assessment**: Design a perceptron classifier to classify handwritten numerical digits (0-9). Implement using scikit.	**LAB FACULTY SIGN:** **CLASS FACULTY SIGN:**	

WEEK -12	Lab Exercise Programs	DATE:
57. Design and Run your First Experiment in Weka 58. Write a python code for Agglomerative clustering with different metrics in Scikit Learn 59. Implement How frequent itemsets are singled out in the transactions using apriori algorithm using weka 60. Illustrates the progression of agglomerative clustering on a two-dimensional dataset, looking for three clusters using weka		**LAB FACULTY SIGN:** **CLASS FACULTY SIGN:**

WEEK -13	Lab Exercise Programs	DATE:
61. Write a Program to Standardize Data Before Agglomerative Clustering 62. Write a Program to Visualize Agglomerative Clustering Results 63. Write a Program to Handle Missing Values Before Agglomerative Clustering using weka 64. Write a Program to Compare Divisive and Agglomerative Clustering Results 65. Write a Program to Handle Missing Data in Divisive Clustering. 66. Write a Program to Perform Divisive Clustering Using Weka's API.	**LAB FACULTY SIGN:** **CLASS FACULTY SIGN:**

WEEK -14	Lab Exercise Programs	DATE:
67. Compute the segmentation of a 2D image with Ward hierarchical clustering 68. Implement the association rules method for analyse buyer baskets and detect cross-category purchase correlations 65 Implement the association ruleS method for Amazon's"Frequently bought together" recommendations. 69. Implement How frequent itemsets are singled out in the transactions using apriori algorithm. 70. Illustrates the progression of agglomerative clustering on a two-dimensional dataset, looking for three clusters		**LAB FACULTY SIGN:** **CLASS FACULTY SIGN:**

WEEK -15	**Lab Exercise Programs**	**DATE:**
71.Write a program that performs Agglomerative Clustering on a 2D dataset and outputs the number of clusters formed at each iteration of the merging process. 72.Write a program that takes a dataset of 2D points and performs Agglomerative Clustering. The program should allow the user to visualize the merging process and the final clusters. **Assessment:** Use WEKA and experiment with the Association Rule Mining (A-priori),Agglomerative and Divisive Clustering	**LAB FACULTY SIGN:** **CLASS FACULTY SIGN:**