Lab Code	CSL604	**Lab Name**	Machine Learning Lab
Academic Year	2024-2025	**Semester**	VI
Class	TE (13)	**Course Incharge**	Mr. Shubham Bakal

Laboratory Outcomes (LO)

LO No.	**LO Statement** (At the end of the course, students will be able to …)	**BL**
1	Implement various Machine learning models.	3
2	Apply suitable Machine learning models for a given problem.	3
3	Implement Neural Network based models.	3
4	Apply Dimensionality Reduction techniques.	3

List of Experiments

Sr. No.	**Title**
1	Study of Machine Learning Libraries and tools (Python library, tensorflow, keras,...)
2	Exploratory Data Analysis and Metrics Perform the following operation on the given dataset: A. Find Shape of Data. B. Find Missing Values. C. Find data type of each column. D. Finding out Zero's. E. Find Mean age of patients. F. Now extract only Age, Sex, ChestPain, RestBP, Chol. Randomly divide the dataset in training (75%) and testing (25%). Through the diagnosis test I predicted 48 report as COVID positive, but only 45 of those were actually positive. Total 40 people in my sample were actually COVID positive. I have total 100 samples Create Confusion Matrix based on above data and find a) Accuracy b) Precision C)Recall d) F1.Score
3	Regression Analysis A. Apply Linear Regression using a suitable library function and predict the Month-wise temperature. B. Assess the performance of regression models using MSE, MAE, and R-Square metrics. C. Visualize a simple regression model.
4	Demonstrate Support Vector Machine

5	Decision Trees and Classification A. Apply Data pre-processing (Label Encoding, Data Transformation….) techniques if necessary. B. Perform data-preparation (Train-Test Split). C. Apply Machine Learning Algorithms. D. Evaluate Model.
6	SMS Spam Detection A. Apply Data pre-processing (Label Encoding, Data Transformation….) techniques if necessary. B. Perform data-preparation (Train-Test Split). C. Apply at least two Machine Learning Algorithms and Evaluate Models. D. Apply Cross-Validation and Evaluate Models and compare performance. E. Apply Hyperparameter tuning and evaluate models and compare performance.
7	Demonstrate K-means Clustering
8	Customer Segmentation A. Apply Data pre-processing (Label Encoding, Data Transformation….) techniques if necessary. B. Perform data-preparation(Train-Test Split). C. Apply Machine Learning Algorithms. D. Evaluate Model. E. Apply Cross-Validation and Evaluate Model.
9	Market Basket Analysis A. Follow the following steps: B. Data Preprocessing. C. Generate the list of transactions from the dataset. D. Train Apriori algorithm on the dataset. E. Visualize the list of rules. F. Generated rules depend on the values of hyper parameters. By increasing the minimum confidence value and find the rules accordingly.
10	Multilayer Neural Network A. Load the dataset in the program. Define the ANN Model with Keras. Define at least two hidden layers. Specify the ReLU function as the activation function for the hidden layer and Sigmoid for the output layer. B. Compile the model with necessary parameters. Set the number of epochs and batch size and fit the model. C. Evaluate the performance of the model for different values of epochs and batch sizes. D. Evaluate model performance using different activation functions Visualize the model using ANN Visualizer.

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Signature:

Date: 6/1/2025