Charotar University of Science and Technology
Devang Patel Institute of Advance Technology and Research
Department of Computer Engineering
Department of Computer Science & Engineering

Subject: Machine Learning   **Semester: 6**
Subject Code: CS 344   **Academic Year: 2021-22**
Student ID: 19DCS098   **Student Name: Parth Niteshkumar Patel**

Practical Index

Sr. No.	AIM	COs	Assignment Date	Completion Date	Grade	Assessment Date	Sign
1	Perform the following using Python Pandas and Matplotlib library on given dataset: i) Deal with missing values in the data either by deleting records or using mean/median/mode imputation. ii) Detect if Outliers exist and Plot the data distribution using Box Plots, Scatter Plots and Histograms of matplotlib library iii) Create and display the correlation matrix of all features of the data. Record and Analyze Observations.						
2	For given Dataset (you may continue to use the same processed dataset from experiment 1 only for this experiment) , perform the following using Python Pandas and scikit-learn library or by writing your own user-defined function:						

	i) Perform Data Standardization and Normalization ii) Select the 10 best features of the data using different statistical scoring methods. (Hint: Chi-Squared Statistical Test is a good scoring method) iii) Split the data into training and testing sets in a ratio of 80:20.						
3	Implement the linear regression and calculate the different evaluation measure (MAE, RMSE etc.). for the same. Also implement gradient descent and observe the cost with linear regression using gradient descent. Do not use any Python library for linear regression. (Hint: Linear Regression Formula is $Y = mX + b$ where Y is target variable and X is independent variable)						
4	Create Visual analysis for the given data set using Matlab.						
5	Implement logistic regression and						

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	calculate the different evaluation measure (F-measures, Confusion Matrix etc.) for the same. Also implement gradient descent and observe the cost with logistic regression using gradient descent. (Hint: Confusion Matrix and F-measures involve use of True Negatives, True Positives, False Negatives and False Positives). Also implement Cross-Validation.						
6	Implement K-Nearest Neighbours, Support Vector Machine (SVM) and Naïve Bayes Classifier with python's Scikit-Learn on different datasets. Compare the classifiers based on their evaluation measures.						
7	Use K-Means Clustering and Hierarchical Clustering algorithm for following datasets.						
8	Implement following using Tensorflow: Constants, Variables, Placeholder, and						

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	operations, creating Graph and executing graph. Perform 3rd practical using TensorFlow.						
9	Implement the Multi-Layer Perceptron from scratch with at least 3 layers for a classification or a regression problem of your choice, implement Backpropogation and observe Underfitting, Overfitting and Regularization.						
10	Implement a Convolutional Neural Network (CNN) using Keras library for a face classification problem. Create dataset of faces of your 5 friends. Also use data augmentation technique to increase dataset.						
11	Train a Reinforcement Learning Agent for the Multi-Armed Bandit Problem and visualize the results using matplotlib or seaborn libraries in Python. Consider at least 15 arms (n=15).						
12	Implement Deep LearningAlgorithm to Predict stock priceson past price variation.						

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