Amrutvahini College of Engineering

Department of Artificial Intelligence And Data Science

Innovative Pedagogy Techniques

Name of Faculty: Ms. S.N. Nawale	**Subject:** Data Science
Class: SE (A,B)	**Academic year:** 2025-26 (Sem-II)

1. Brainstorming was used for following topics:

Unit no.	Name of the topic
1	Case study -A telecom business wants to proactively identify customers who are likely to quit because of the high rate of customer turnover.
2	Case study -In a dataset, you have a feature matrix and output vector .Elaborate, How does matrix multiplication help in solving linear regression using the Normal Equation.
3	Case study -Write a case study on E-commerce Data. Key Components of the Analytical Plan are: Problem statement and objectives, Data Collection and Preparation, Data Analysis and Model Development, Analysis Outcomes and Takeaways
4	Case study -Exploratory Data Analysis (EDA) and Visualizations 2. Create simple plot to visualize a distribution of variables using python
5	Case study -A retail company wants to predict its future sales revenue based on various factors such as product pricing, marketing spends, seasonal trends, and customer demographics.

2. Seminar/ Presentation:-

Unit no.	Name of the topic
1	Case study - A telecom business wants to proactively identify customers who are likely to quit because of the high rate of customer turnover
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3. Animation:

Unit no.	Name of the topic
2	Role of mathematical statistics in building data models,
4.	Exploratory Data Analysis (EDA)
5.	Tools and Technologies.

4. Videos:

Unit no.	Name of the topic
3	Matplotlib: Basic & Advanced Plots, Customization, Subplots, Interactive Features.

5. Quiz

Unit no.	Name of the topic
4	Data Preprocessing, Data Cleaning: Handling missing data, outliers.
5	Open-source Tools and Environments: Python, R, Jupyter, Git, VS Code and its roles in data science.

6. Role-play

Unit no.	Name of the topic
On the basis of all units	After completion of All Data Transformation students performed role play on Which Data Transformation is better?

Ms. S.N. Nawale
Subject Teacher

Dr. A. R. Panhalkar
Head of Department

Amrutvahini College of Engineering

Department of Computer Engineering

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Case Study Presentation

Unit no.	Name of the topic	Students Name
1	Case Study – A telecom business wants to proactively identify customers who are likely to quit because of the high rate of customer turnover.	Ms. Balsane Prerna Roll No- 309
2	Case Study- In a dataset, you have a feature matrix and output vector .Elaborate, How does matrix multiplication help in solving linear regression using the Normal Equation.	Mr. Darndale Harshal Roll No- 323
3	Case Study- Write a case study on E-commerce Data. Key Components of the Analytical Plan are: Problem statement and objectives, Data Collection and Preparation, Data Analysis and Model Development, Analysis Outcomes and Takeaways.	Mr. Mande Vedant Roll No-411
4	Case study- Exploratory Data Analysis (EDA) and Visualizations 2. Create simple plot to visualize a distribution of variables using python.	Ms. Shaikh Sofin Roll No-439
5	Case Study- A retail company wants to predict its future sales revenue based on various factors such as product pricing, marketing spends, seasonal trends, and customer demographics.	Mr. Mundhe Vaibhav Roll No- 315

Quiz

1)What is the purpose of the term "feature engineering" in machine learning?

A) Extracting valuable information from the target variable
B) Creating new features or modifying existing ones to improve model performance
C) Selecting the most important features for model training
D) Normalizing feature values to have zero mean and unit variance

2)In machine learning, what is feature scaling?

A) Modifying features to have comparable scales
B) Creating new features from existing ones
C) Removing irrelevant features from the dataset
D) Encoding categorical variables

3)What is the primary purpose of the term "word embedding" in natural language processing (NLP)?

A) Representing words as sparse binary vectors
B) Encoding words into numerical vectors with continuous values
C) Tokenizing sentences into individual words
D) Reducing the dimensionality of word representations

4)In statistics, what does the term "p-value" represent in hypothesis testing?

A) The probability of making a Type II error
B) The probability of observing the data given that the null hypothesis is true
C) The significance level for the test
D) The probability of rejecting the null hypothesis

5)Explain the concept of the "bias-variance trade-off" in machine learning.

A) The trade-off between the number of features and model complexity
B) Balancing precision and recall in classification problems
C)The trade-off between model flexibility and stability
D)Minimizing both training and testing errors

6)What is the purpose of the term "Bayesian inference" in statistics and machine learning?

A) Estimating parameters based on prior knowledge and observed data
B) Fitting models to the training data using maximum likelihood estimation
C) Combining predictions from multiple models using Bayesian averaging
D) Evaluating models using cross-validation

7)What is the role of the "learning rate" in gradient descent optimization?

A) The size of the steps taken during each iteration
B) The regularization strength applied to the mod
C)The number of iterations in the optimization process
D)The speed at which the algorithm converges

8)Explain the term "Gini impurity" in the context of decision trees.

A) A measure of impurity or disorder in a set of data
B) A measure of information gain in feature selection
C) A criterion used to split nodes in a decision tree
D) A method for pruning decision trees

9)What is the role of the term "dropout" in neural networks?
A) Improving model interpretability
B) Reducing the learning rate during training
C) Introducing non-linearity to the model
D) Preventing overfitting by randomly dropping neurons during training

10)Explain the term "precision" in the context of binary classification.
A) The ratio of true positive predictions to the total positive predictions
B) The ratio of true positive predictions to the sum of true positives and false negatives
C) The ratio of true positive predictions to the sum of true positives and false positives
D)The ratio of true positive predictions to the total predictions made by the model

Ms. S.N. Nawale
Subject Teacher

Dr. A. R. Panhalkar
Head of Department

Mr. V.K.Abhang
Subject Teacher

Dr. S. K. Sonkar
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