Topics for 5-Day Program To be Conducted in Offline-Online Mode

Session Plan

Overview -
This workshop will be conducted in 2 days in Classroom format, 2 sessions daily.
9am - 10am: Breakfast
10am - 1pm: Session 1
1pm - 2pm: Lunch
2pm - 5pm: Session 2

Takeaways:

- Master implementation of machine learning algorithms
- Learn how to visualise and get insights from your data
- Build Movie/Product Recommendation engine using collaborative filtering
- Build neural networks for image recognition
- Techniques for analysing textual data
- Build your smart search engine
- Hackathon and certificate

Pre-work:

- Python for Machine learning
- Intro to pandas
- Intro to numpy
- Intro to Matplotlib

1. Day 1 : Session 1 **(CR)**:
    a. Engaging audience with scope and potential of machine learning and data science.
    b. Intro to Data Science -
        i. What is Big Data, ML, AI?
        ii. Different types of problems - Supervised/Unsupervised
        iii. Differentiating between Classification, Regression, Clustering, Collaborative filtering, Time series/Forecasting problem.
    c. Python Intro
    d. Data Visualisation Techniques using Matplotlib

2. Day 1 : Session 2 **(CR)**:
    a. Pandas
    b. Regression Algorithms :
        i. Linear Regression
        ii. Multiple linear regression
        iii. Intro to Decision trees, Random forest, SVM

c. Classification Algorithms:
    i. Logistic regression
    ii. KNN

3. Day 2 - Session 1 **(CR)** :
    a. Decision Trees
        i. Training and Visualizing a Decision Tree
        ii. Predictions and Class Probabilities
        iii. CART Training algorithms
    b. Random Forests
        i. Extra trees
        ii. Feature Importance

4. Day 2 : Session 2 **(CR)**
    a. Artificial neural networks
        i. How does our brain work?
        ii. How do Neural Networks work?
        iii. Understanding components of a neural network.
            1. Types of layers of a neural network
            2. Activation functions
            3. Gradient Descent
            4. Stochastic Gradient Descent
            5. Backpropagation
        iv. Building a Neural network:
    b. Voice Bot Building

5. Day 3 - Session 1 **ONLINE**
    a. Advanced Topics:
        i. Training Sets - Test Sets (Split-Test-Train)
        ii. Cross-Validation - k Fold
        iii. Feature Scaling
        iv. Feature Creation
        v. Dealing with Categorical Data
        vi. Dealing with Missing Data
        vii. Outlier Detection and Removal
        viii. Feature Importance
        ix. Model Evaluation techniques:
            1. MAE
            2. RMSE
            3. Confusion Matrix

6. Day 3 - Session 2 **ONLINE**
    a. Unsupervised Algorithms:
        i. K Means clustering
        ii. Recommendation Engine using Collaborative filtering
        iii. Association Rule Mining - Apriori and Eclat

7. Day 4 : Session 1 **ONLINE**
    a. Project 1: End to End Data Visualization case study
8. Day 4 : Session 2 **ONLINE**
    a. Project 2: End to End Data Regression Problem

9. Day 5 : Session 1 **ONLINE**
    a. Project 3: End to End Classification Problem
10. Day 5 : Session 2 **ONLINE**
    a. Project 4: End to End Voice Bot Building or ANN Problem

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