5-Day Workshop Plan

Mastering Artificial Intelligence and Machine Learning

Day 1: Introduction to AI & ML

Session Overview: This session will introduce the basics of Artificial Intelligence and Machine Learning, their significance, and practical applications.

Schedule:

- **10:00 AM - 10:15 AM: Welcome & Introduction**
- **Introduction to the workshop agenda and overview of AI & ML.**
- **10:15 AM - 11:15 AM: Foundations of AI & ML**
- **Understanding the types of AI and ML: Supervised, Unsupervised, and Reinforcement Learning.**
- **11:15 AM - 11:30 AM: Break**
- **11:30 AM - 1:00 PM: Basic Terminology and Concepts**
- **Learn fundamental terms such as data, features, labels, models, algorithms, training, and testing.**
- **2:00 PM - 2:15 PM: Recap and Q&A**
- **Opportunity to address questions and review key concepts.**
- **2:15 PM - 3:15 PM: Tools for AI/ML**
- **Introduction to Python and libraries (NumPy, Pandas, Scikit-learn, Matplotlib).**
- **3:15 PM - 3:30 PM: Break**
- **3:30 PM - 5:00 PM: Hands-on: Setting up a Python Environment**
- **Installing necessary libraries, writing the first Python script, and exploring datasets.**

sltechhsolutions@gmail.com

91-8341475919

5-Day Workshop Plan

Mastering Artificial Intelligence and Machine Learning

Day 2: Supervised Learning – Regression and Classification

Session Overview: Day 2 focuses on understanding and implementing Regression and Classification models, which are foundational techniques in supervised learning.

Schedule:

- **10:00 AM - 10:15 AM: Recap of Day 1**
- **Quick review of the previous day's content and opportunity for questions.**
- **10:15 AM - 11:15 AM: Linear Regression**
- **Overview of Linear Regression, cost functions, and gradient descent.**
- **11:15 AM - 11:30 AM: Break**
- **11:30 AM - 1:00 PM: Logistic Regression**
- **Learn about logistic regression, activation functions, and decision boundaries.**
- **2:00 PM - 2:15 PM: Recap and Q&A**
- **Open session for addressing questions from participants.**
- **2:15 PM - 3:15 PM: K-Nearest Neighbors (KNN)**
- **Explore KNN as a classification technique, understanding its algorithm and applications.**
- **3:15 PM - 3:30 PM: Break**
- **3:30 PM - 5:00 PM: Hands-on: Implementing Regression and KNN**
- **Implement Linear Regression and KNN algorithms and evaluate their performance on datasets.**

sltechhsolutions@gmail.com

91-8341475919

5-Day Workshop Plan

Mastering Artificial Intelligence and Machine Learning

Day 3: Clustering and Dimensionality Reduction

Session Overview: On Day 3, the focus will shift to unsupervised learning techniques such as clustering and dimensionality reduction, including K-Means and PCA.

Schedule:

- **10:00 AM - 10:15 AM: Recap of Day 2**
- **Quick session to clarify concepts from the previous day.**
- **10:15 AM - 11:15 AM: Clustering: K-Means**
- **Learn the K-Means clustering algorithm and its use in grouping similar data points.**
- **11:15 AM - 11:30 AM: Break**
- **11:30 AM - 1:00 PM: Hierarchical Clustering**
- **Introduction to agglomerative and divisive hierarchical clustering methods.**
- **2:00 PM - 2:15 PM: Recap and Q&A**
- **Opportunity for participants to ask questions and clarify doubts.**
- **2:15 PM - 3:15 PM: Principal Component Analysis (PCA)**
- **Understanding PCA for dimensionality reduction and its use in simplifying data for visualization.**
- **3:15 PM - 3:30 PM: Break**
- **3:30 PM - 5:00 PM: Hands-on: Clustering & PCA**
- **Implement K-Means, hierarchical clustering, and PCA on sample datasets.**

sltechhsolutions@gmail.com

91-8341475919

5-Day Workshop Plan

Mastering Artificial Intelligence and Machine Learning

Day 4: Model Evaluation and Hyperparameter Tuning

Session Overview: Day 4 will focus on evaluating the performance of ML models and learning techniques to improve them, including cross-validation and hyperparameter tuning.

Schedule:

- **10:00 AM - 10:15 AM: Recap of Day 3**
- **Review the material covered on Day 3 and address any queries.**
- **10:15 AM - 11:15 AM: Model Evaluation Metrics**
- **Learn how to evaluate models using metrics like accuracy, precision, recall, F1-score, and ROC-AUC.**
- **11:15 AM - 11:30 AM: Break**
- **11:30 AM - 1:00 PM: Cross-Validation & Grid Search**
- **Learn about cross-validation techniques and how to use grid search for hyperparameter tuning.**
- **2:00 PM - 2:15 PM: Recap and Q&A**
- **Review and clarify any questions regarding model evaluation and tuning.**
- **2:15 PM - 3:15 PM: Regularization Techniques**
- **Understand L1 and L2 regularization methods to avoid overfitting in models.**
- **3:15 PM - 3:30 PM: Break**
- **3:30 PM - 5:00 PM: Hands-on: Model Evaluation & Tuning**
- **Hands-on session on evaluating models and performing hyperparameter tuning using cross-validation and grid search.**

sltechhsolutions@gmail.com

91-8341475919

5-Day Workshop Plan

Mastering Artificial Intelligence and Machine Learning

Day 5: Deep Learning and Neural Networks

Session Overview: Day 5 will cover advanced topics in machine learning, focusing on deep learning techniques, including neural networks and convolutional neural networks (CNNs).

Schedule:

- **10:00 AM - 10:15 AM: Recap of Day 4**
- **A quick recap of Day 4 and a Q&A session to clarify doubts.**
- **10:15 AM - 11:15 AM: Introduction to Neural Networks**
- **Participants will learn the basics of neural networks, including architecture, activation functions, and forward/backward propagation.**
- **11:15 AM - 11:30 AM: Break**
- **11:30 AM - 1:00 PM: Building a Simple Neural Network**
- **Hands-on session on building and training a neural network using Keras or TensorFlow.**
- **2:00 PM - 2:15 PM: Recap and Q&A**
- **Review and address any questions regarding neural networks.**
- **2:15 PM - 3:15 PM: Convolutional Neural Networks (CNNs)**
- **Introduction to CNNs, their use in image classification, and hands-on implementation.**
- **3:15 PM - 3:30 PM: Break**
- **3:30 PM - 5:00 PM: Hands-on: Deep Learning Projects**
- **Implement and train CNN models for image classification using datasets like MNIST.**

sltechhsolutions@gmail.com

91-8341475919