PYTHON AI

1: Introduction to Artificial Intelligence

1.1. What is Artificial Intelligence?
1.2. AI History and Milestones
1.3. Types of AI: Narrow vs. General AI
1.4. Review of Python Basics
1.5. NumPy and SciPy for Scientific Computing
1.6. Pandas for Data Manipulation

2: Machine Learning Fundamentals

2.1. Machine Learning Introduction
2.2. Types of Machine Learning: Supervised, Unsupervised, Reinforcement
2.3. The Machine Learning Workflow
2.4. Scikit-Learn Overview
2.5. Data Preprocessing and Cleaning
2.6. Handling Missing Data
2.7. Exploratory Data Analysis (EDA)
2.8. Matplotlib and Seaborn for Data Visualization

3: Supervised Learning

3.1. Linear Regression
3.2. Simple Linear Regression
3.3. Multiple Linear Regression
3.4. Classification Algorithms
3.5. Logistic Regression
3.6. K-Nearest Neighbors (KNN)
3.7. Decision Trees and Random Forest

4. Unsupervised Learning
4.1. Clustering Algorithms
4.2. K-Means Clustering
4.3. Hierarchical Clustering
4.4. Dimensionality Reduction
4.5. Principal Component Analysis (PCA)
4.6. t-Distributed Stochastic Neighbor Embedding (t-SNE)

5: Neural Networks and Deep Learning
5.1. Introduction to Neural Networks
5.2. Perceptrons and Activation Functions
5.3. Building Neural Networks with TensorFlow/Keras
5.4. Deep Learning
5.5. Convolutional Neural Networks (CNNs)
5.6. Recurrent Neural Networks (RNNs)
5.7. Transfer Learning

6:Advanced AI Topics
6.1. Natural Language Processing (NLP)
6.2. Tokenization and Text Preprocessing
6.3. Building NLP Models with Python (e.g., SpaCy, NLTK)
6.4. Reinforcement Learning and AI Ethics
6.5. Markov Decision Processes (MDPs)
6.6. Q-Learning and Deep Q-Networks (DQNs)
6.7. Ethical Considerations in AI

7:Final Project and Course Review
7.1. Capstone Project: Students will work on a real-world AI project

of their choice, applying the skills learned throughout the course.
7.2. Course Review and Exam: A final review of key concepts and an assessment to test students' knowledge.

8:Additional Topics (Optional, depending on course duration)

8.1.Time Series Analysis
8.2.Generative Adversarial Networks (GANs)
8.3.AI Deployment and Model Serving
8.4.Explainable AI (XAI)
8.5.AI in Computer Vision