Introduction to Artificial Intelligence and Machine Learning with Python

Course Objective:

This introductory course is designed to teach students the basics of artificial intelligence (AI) and machine learning (ML) using Python. Through hands-on projects and engaging lessons, students will explore the foundational concepts of data science, learn to use essential coding tools, and implement simple AI models. By the end of the course, students will have a basic understanding of AI and ML fundamentals and the skills to create basic models using Python.

Course Curriculum:

- ❖ Class 1: Introduction to Data Science and Machine Learning
  - Learn what data science and machine learning are and their real-world applications.
  - Introduction to coding tools: Google Colab for interactive coding and Python as the programming language of choice.
  - Set up Google Colab and write simple Python scripts to familiarize students with the environment.
- ❖ Class 2: Python Libraries for Data Science
  - Introduction to essential Python libraries: NumPy for numerical operations, Pandas for data manipulation, and Matplotlib for data visualization.
  - Hands-on exercises to explore data manipulation and visualization techniques.
  - Create simple plots and analyze data using these libraries to build a foundation for ML tasks.
- ❖ Class 3: Understanding Linear Regression
  - Learn the concept of linear regression and its use in predicting outcomes.
  - Implement linear regression from scratch using Python to understand the underlying mechanics.
  - Use scikit-learn to perform linear regression on the Iris dataset, comparing manual implementation with library functions.
- ❖ Class 4: Introduction to TensorFlow
  - Introduction to TensorFlow, a popular library for building AI models.
  - Set up a simple neural network and understand its components.
  - Explore basic TensorFlow operations and build a model for a simple classification task.
- ❖ Class 5: Advanced TensorFlow and TensorBoard
  - Delve deeper into TensorFlow by implementing more complex models.
  - Use TensorBoard to visualize model performance and understand training processes.
  - Apply TensorFlow to the MNIST dataset to create a handwritten digit recognition model.
- ❖ Class 6: Artificial Neural Networks (ANN) Competition
  - Introduce the concept of artificial neural networks and their applications.
  - Engage students in a friendly competition using the Fashion MNIST dataset.

- Encourage creativity and problem-solving by having students design and implement their own models.
- Share results and discuss different approaches taken by students, fostering collaboration and learning from peers.

This curriculum aims to provide a balanced mix of theoretical understanding and practical application, ensuring that students not only learn the basics of AI and ML but also enjoy the process of creating and experimenting with their own models.

Contact Us: **contact@brilliolearning.com**