Machine Learning & AI Internship Tasks (1-Month)

Domain: Machine Learning & Artificial Intelligence
Duration: 1 Month
Ideal For: Students with basic Python knowledge and interest in AI/ML
Tools & Libraries: Python, NumPy, Pandas, Scikit-learn, Matplotlib, Seaborn, TensorFlow/Keras (optional)

🔹 Task 1: Introduction to Machine Learning with Scikit-learn

Objective:
Understand core ML concepts and apply simple models on beginner datasets.

Tasks:

- Study types of ML (supervised, unsupervised)
- Load and analyze the Iris or Titanic dataset
- Apply classification algorithms: Logistic Regression, KNN
- Evaluate models using confusion matrix and accuracy

Deliverables:

- Jupyter Notebook with code and results
- Summary document explaining model choice and evaluation

🔹 Task 2: Linear Regression Project – Predicting House Prices

Objective:
Apply regression to predict numerical outcomes and handle preprocessing steps.

Tasks:

- Load housing dataset (e.g., Boston Housing)
- Perform feature selection and preprocessing (encoding, scaling)

- Train a Linear Regression model
- Evaluate using R^2 Score and Mean Squared Error

Deliverables:

- Jupyter Notebook with feature engineering and analysis
- Plots showing model fit and residuals

🔹 Task 3: Unsupervised Learning – Customer Segmentation

Objective:
Apply clustering techniques to segment customer data into different groups.

Tasks:

- Load a marketing or mall customer dataset
- Use K-Means clustering to create customer segments
- Visualize clusters using PCA or t-SNE

Deliverables:

- Notebook showing cluster analysis and visualizations
- Insights report on customer behavior by cluster

🔹 Task 4: AI Mini Project – Build a Handwritten Digit Classifier (MNIST)

Objective:
Use a neural network to recognize digits using the MNIST dataset.

Tasks:

- Load MNIST dataset using TensorFlow/Keras
- Build a basic neural network using Keras Sequential API

- Train and evaluate the model
- Display predictions on sample images

Deliverables:

- Complete notebook with model architecture, training logs, accuracy
- Screenshots of digit predictions

📌 General Instructions:

- Use Jupyter Notebook for all tasks
- Submit each task as a `.ipynb` or GitHub repo with a short write-up (PDF/Markdown)