Download Roadmap

1. Prerequisites

- Basic Math: Linear Algebra, Probability, Statistics
- Python Programming
- Basic Data Structures & Algorithms
- Git & Version Control

2. Python for Data Science

- Numpy
- Pandas
- Matplotlib / Seaborn
- Jupyter Notebooks

3. Data Preprocessing

- Data Cleaning
- Handling Missing Values
- Feature Engineering
- Data Normalization & Standardization

Exploratory Data Analysis (EDA)

- Data Visualization
- Correlation & Trends
- Univariate & Multivariate Analysis

5. Supervised Learning

- Linear & Logistic Regression
- Decision Trees
- Random Forests
- Gradient Boosting (XGBoost, LightGBM)
- Support Vector Machines (SVM)
- Model Evaluation: Accuracy, Precision, F1-Score

6. Unsupervised Learning

- Clustering (K-Means, Hierarchical)
- Dimensionality Reduction (PCA, t-SNE)
- Anomaly Detection

7. Model Deployment

- Model Serialization (Pickle, Joblib)
- Creating APIs with Flask or FastAPI
- Docker Basics
- Cloud Platforms (AWS, GCP, Azure)
- CI/CD Basics

8. Deep Learning Basics

- Neural Networks
- Backpropagation
- Activation Functions
- Overfitting, Underfitting
- Libraries: TensorFlow, Keras, PyTorch

9. Advanced Topics

- Transfer Learning
- Reinforcement Learning
- Natural Language Processing (NLP)
- Computer Vision (CV)
- Model Explainability (SHAP, LIME)