■ 1-Year ML/AI Learning Roadmap

Months 1–2: Foundations

- Python basics: numpy, pandas, matplotlib, seaborn
- Maths: Linear algebra, probability, statistics
- Mini projects: data cleaning, visualization (Iris dataset)

Months 3–4: Core Machine Learning

- Supervised vs Unsupervised learning
- Algorithms: Linear/Logistic Regression, Decision Trees, Random Forest, KNN, SVM, K-means
- Evaluation metrics: Accuracy, Precision, Recall, F1
- Mini projects: house price prediction, spam classifier, customer segmentation

Months 5–6: Deep Learning Basics

- Neural networks: perceptron, activation, backpropagation
- Frameworks: TensorFlow, PyTorch
- CNNs (images), RNNs/LSTMs (sequences)
- Mini projects: MNIST digit recognition, cats vs dogs classifier, sentiment analysis

Months 7–8: Advanced Deep Learning

- Transfer Learning: ResNet, VGG
- NLP with Transformers: BERT, GPT basics, Hugging Face
- Generative models: Autoencoders, GANs
- Mini projects: text summarizer, fake news detection, face generation

Months 9–10: Specialization

- Pick one: Computer Vision, NLP, or Reinforcement Learning
- CV: Object detection (YOLO, Faster R-CNN), OpenCV
- NLP: Chatbots, translation models
- RL: Game AI, robotics
- Mini projects: chatbot, object detection app, game agent

Months 11–12: MLOps & Projects

- Deployment: Flask/FastAPI, Streamlit
- MLOps basics: Git, Docker, Cloud (AWS, GCP, Azure)
- Capstone projects: recommendation system, AI assistant, end-to-end ML app
- Participate in Kaggle competitions