8-Week AI Learning Roadmap

Week 1: Python Logic & AI Essentials

- Loops, functions, classes, exception handling
- Practice on HackerRank, LeetCode (5 easy problems/day)
- Use Jupyter Notebooks for interactive coding

Week 2: Math for ML

- Linear Algebra: vectors, matrices
- Probability: mean, variance, distributions
- Code exercises using numpy, scipy, Khan Academy stats

Week 3: Intro to Machine Learning

- ML overview: Supervised vs Unsupervised
- Linear & Logistic Regression
- Hands-on with sklearn, project: Predict student scores

Week 4: Classification Models & Evaluation

- KNN, SVM, Decision Trees
- Confusion matrix, accuracy, precision, recall
- Project: Titanic survival prediction (Kaggle)

Week 5: Deep Learning Fundamentals

- Neural networks: perceptrons, activations
- Feedforward networks, backpropagation
- Use TensorFlow or PyTorch, MNIST digit recognizer

Week 6: CNNs & Image Classification

- Convolution, pooling layers
- CNN architecture in TensorFlow/PyTorch
- Project: CIFAR-10 or MNIST image classifier

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Week 7: NLP & Language Models

- Tokenization, stemming, stopwords
- Bag-of-Words, TF-IDF with NLTK or spaCy
- Project: Sentiment analysis of reviews

Week 8: Generative AI & LLMs

- Transformers, attention mechanism (basics)
- Prompt engineering, OpenAI & Hugging Face
- Project: Build GPT-powered assistant or chatbot