AI/ML Engineer Roadmap

**3 Fundamental Concept**

**Math, Python, Core DSA**

**Step 1: Mathematic Fundamentals:**

Vectors and Matrices **For Machine Learning Models**

* Linear Algebra
* Calculus
* Probability
* Discrete Mathematics

**Step 2:** **Programming Language – Python:**

* Variables
* Conditionals
* Loops
* Functions
* OOPS (Object oriented Programming)

**Step 3:** **Data Structure and Algorithms**

* Arrays
* Linkedlist
* Stack
* Queues
* Trees

**Step 4: Data Science:**

1. **Dealing with data**

* Clean Dataset
* Analyz and Pre-process Data

**Python Libraries:**

* Numpy
* Regex
* OpenCV
* Pandas

For Visualization:

* Matplotlib
* Seaborn

1. **Machine Learning**

**(Main Parts)**

* Supervised
* Unsupervised
* Reinforcement learning

**What we learn in Machine Learning:**

* Regression
* Classification
* Decision Trees
* SVM
* Clustering
* Reinforcement learning

In order to learn all of these we use **Scikit** library

1. **Deep Learning**

We learn **Neural Networks**

**Most Common:**

ANN (Artificial Neural Networks)

CNN (Convolutional Neural Network)

RNN (Recurrent Neural Network)

GAN (Generative Adversial Networks)

Back Propagation Algorithms

Forward Propagation Algorithms

1. **LLMs:**

**ChatGPT Gemini LLAMA2**

LLMs are a mixed of NLP (Natural Language Process) and GenAI (generative AI)

**STEP 5: REAL WORLD PROJECTS**

**Implementations:  
1. Finance**

- Loan Risk Analysis

- Fraud Detection

**2. Entertainment**

- Health Monitoring

- Drug Discovery

**3. Health care**

**4. E-commerce**

When we are discovering Machine Learning, Deep learning and GenAI we use scikit learn, Keras, PyTorch(Academic Focused) and Tensorflow (Industry Focused) libraries

**Project Ideas:**

1. **FAKE NEWS/BOT DETECTION PLATFORM**

* NLP Techniques
* Deep learning Models like BERT LSTM

1. **TEXT SUMMARIZATION TOOL**

* NLP Techniques and transformer **Hugging face**

1. **ART GENERATOR**