

Here's a clear and beginner-friendly breakdown of AI and ML, and how to start learning them from scratch.

1. What is AI (Artificial Intelligence)?

Artificial Intelligence (AI) is the science of making machines **think and act like humans**. It's about creating systems that can **learn, reason, plan, perceive, and understand natural language**.

Examples of AI in daily life:

- Voice assistants like Alexa, Siri
- Recommendation systems on Netflix or Amazon
- Self-driving cars
- Spam email filters

Key idea: AI is the broad field; it covers anything that makes machines “intelligent.”

2. What is ML (Machine Learning)?

Machine Learning (ML) is a **subset of AI**. It's about teaching machines to **learn from data and make predictions or decisions without being explicitly programmed**.

Examples of ML:

- Predicting house prices
- Detecting fraud in banking transactions
- Recognizing faces in photos
- Predicting stock prices

Key idea: AI is the goal (intelligent behavior), ML is one way to achieve it (learning from data).

3. How to Start Learning AI and ML as a Beginner

Step 1: Learn the Basics of Math & Programming

- **Math:** Focus on

- Linear Algebra (matrices, vectors)
- Probability & Statistics
- Basic Calculus (derivatives, optimization)
- **Programming:** Learn Python
 - Libraries: NumPy, Pandas, Matplotlib, Seaborn

Notes on it:-

<https://geocities.ws/ommauryasir/python/lectures/python-lecture-on-numpy-pandas-matplotlib.pdf>

pandas notes:-

<https://geocities.ws/ommauryasir/data-analysis-with-python/pandas.pdf>

filter data using pandas:-

<https://geocities.ws/ommauryasir/data-analysis-with-python/panda-filter.pdf>

matplotlib notes:-

<https://geocities.ws/ommauryasir/data-analysis-with-python/matplotlib.pdf>

example on pandas and matplotlib with csv data analysis:-

<https://geocities.ws/ommauryasir/data-analysis-with-python/data-analysis-admission-sources.pdf>

Step 2: Learn Core Machine Learning Concepts

Start with simple ML concepts and gradually move to complex ones.

- **Supervised Learning:** Regression (predict numbers), Classification (predict categories)
- **Unsupervised Learning:** Clustering, Dimensionality reduction
- **Basic model evaluation:** Accuracy, Precision, Recall

Tools: Scikit-learn (Python library for ML)

Notes on Machine Learning :-

<https://geocities.ws/ommauryasir/ml/ml2.pdf>

Notes on What is Ai Model and how to develop it :-

<https://geocities.ws/ommauryasir/ai/ai-model/What%20Is%20an%20AI%20Model%20and%20How%20to%20develop%20ai%20model.pdf>

<https://geocities.ws/ommauryasir/ai/ai-model/scikit-learn.pdf>

Step 3: Practice with Small Projects

Hands-on practice is key. Start small:

- Predict housing prices (regression)

Notes:-

<https://geocities.ws/ommauryasir/ai/ai-model/ai-model-for-house-price-prediction.pdf>

- Classify emails as spam or not spam
- Predict customer churn for a company

Use datasets from:

- Kaggle
- UCI Machine Learning Repository

Step 4: Learn Deep Learning

Once comfortable with ML, explore **Deep Learning**, which is used in AI applications like image recognition and NLP.

- **Tools:** TensorFlow, PyTorch, Keras
- **Concepts:** Neural Networks, CNN (images), RNN (text)

Deep learning notes:-

<https://geocities.ws/ommauryasir/ai/deep-learning/deep-learning-tensorflow.pdf>

Tensorflow notes for house price prediction model :-

<https://geocities.ws/ommauryasir/ai/deep-learning/House%20price%20prediction-model-with-tensorflow.pdf>

Pytorch notes for house price prediction model:-

<https://geocities.ws/ommauryasir/ai/deep-learning/houese-price-prediction-ai-model-using-pytorch.pdf>