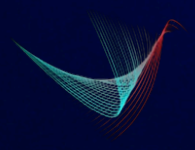
ML Mastery

Roadmap To Machine Learning



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Programming

This is your foundation:

- **Python:**
  - Learn core programming concepts.
- **NumPy & Pandas:**
  - Master **NumPy** for vector/matrix math and **Pandas** for data cleaning and manipulation.
- **Scikit-Learn**
  - This library is your testing ground for models.

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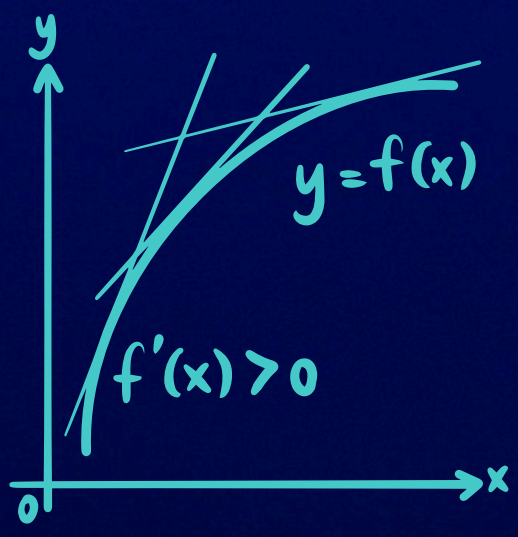
Mathematics

This explains why the algorithms work.

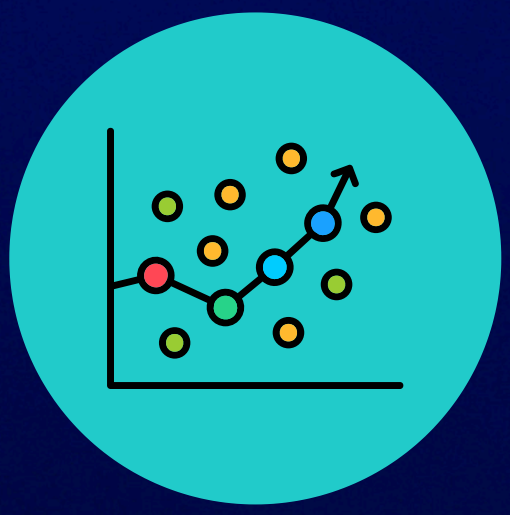
- **Linear Algebra**
  - Vectors, matrices, matrix multiplication, transpose, and SVD. The language of ML!
- **Calculus**
  - Understand **Gradients** and the **Chain Rule** (essential for training Neural Networks).
- **Probability/Statistics**
  - Grasp distributions, probability, and key concepts like **bias/variance.**



Classical Machine Learning

Core algorithms to understand concepts like prediction, classification, & evaluation.

- **Supervised Learning**
  - Linear & Logistic Regression, Decision Trees, Random Forest
- **Unsupervised Learning**
  - K-Means Clustering, PCA (Dimensionality Reduction)
- **Model Evaluation**
  - Accuracy, Precision, Recall, F1



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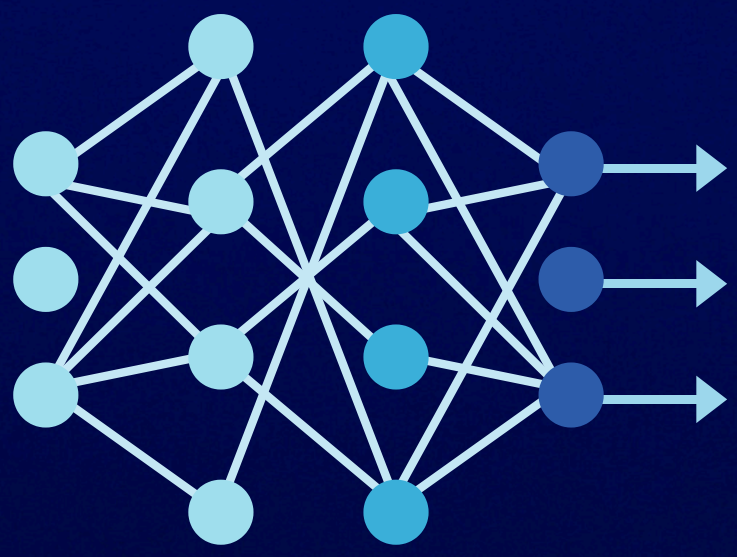
Deep Learning

Transition to large-scale, complex models using modern frameworks.

- **Fundamentals**
  - Master Neural Network architecture (layers, forward pass, backpropagation)
- **Frameworks**
  - PyTorch, TensorFlow, and how to work with tensors.
- **Specialized Models**
  - CNNs, RNNs, and Transformers.



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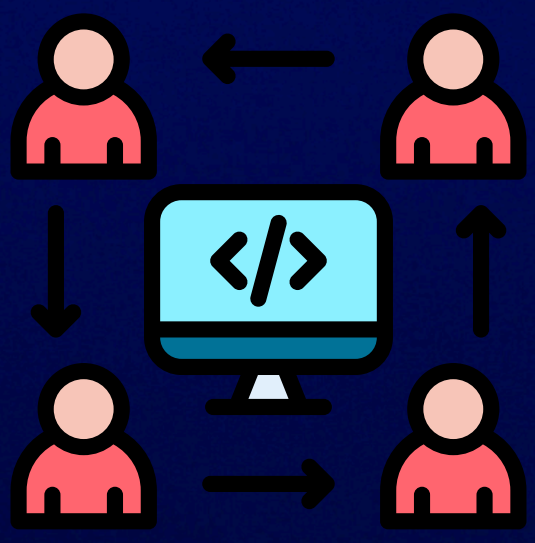
Deployment & MLOps

Learn how to deploy models so users can actually interact with them.

- **Deployment**
  - Practice packaging and hosting your models using Flask or Streamlit.
- **Cloud:**
  - Understand how to run and manage ML models on commercial platforms. (AWS, Azure, etc.)
- **MLOps:**
  - Learn concepts of monitoring models in production & updating them when performance degrades.



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Portfolio & Projects

Prove your skills!

- **End To End Projects**
  - Build 3-5 projects that showcase skills in different areas (e.g., a computer vision project, a time series forecast, and a natural language classification tool).
- **Storytelling**
  - Use a simple online portfolio (like GitHub Pages or a personal site) to explain the business impact of your projects, not just code.