🎓 Supervised Machine Learning – Regression & Classification

Based on the course by Andrew Ng | Stanford University | via Coursera (Free to audit)

📄 Cover Page (Optional in PDF Export)

Title: Supervised Machine Learning – Regression & Classification
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Course Instructor: Andrew Ng
Platform: Coursera (by DeepLearning.AI & Stanford University)

📓 Course Overview

This course introduces the **core concepts of supervised learning**, with a focus on **regression** and **classification**. It is part of the *Machine Learning Specialization* and taught by **Andrew Ng**, one of the most influential figures in AI education.

🔍 What You'll Learn

1. Supervised Learning Fundamentals

- What supervised learning is
- The difference between **regression** and **classification** tasks
- Real-world applications for each

2. Core Machine Learning Algorithms

- Linear Regression
- Logistic Regression
- Gradient Descent
- Multivariate Regression

3. Model Performance & Evaluation

- Loss functions: **MSE**, **Log Loss**
- Metrics: **Accuracy**, **Precision**, **Recall**, **F1 Score**
- Bias–variance tradeoff
- Avoiding **overfitting** and **underfitting**

4. Practical Tools & Techniques

- Training, validation, and test sets
- Feature scaling & normalization
- Polynomial regression
- Decision boundaries (intro)

🧠 Why This Course Matters

Understanding supervised learning is **fundamental to building real-world AI systems**. Whether you're working on email spam detection, sales forecasting, or recommendation engines — these are the building blocks of applied machine learning.

🛠️ Technologies / Tools Used

- Python (examples provided in code cells)
- Jupyter Notebooks (for hands-on practice)
- Assignments to reinforce each concept

👤 Who Is This Course For?

- Beginners in Machine Learning
- Software developers entering the AI space
- Data analysts and engineers seeking to upskill

🔗 Course Link

👉 Supervised Machine Learning: Regression and Classification – Coursera

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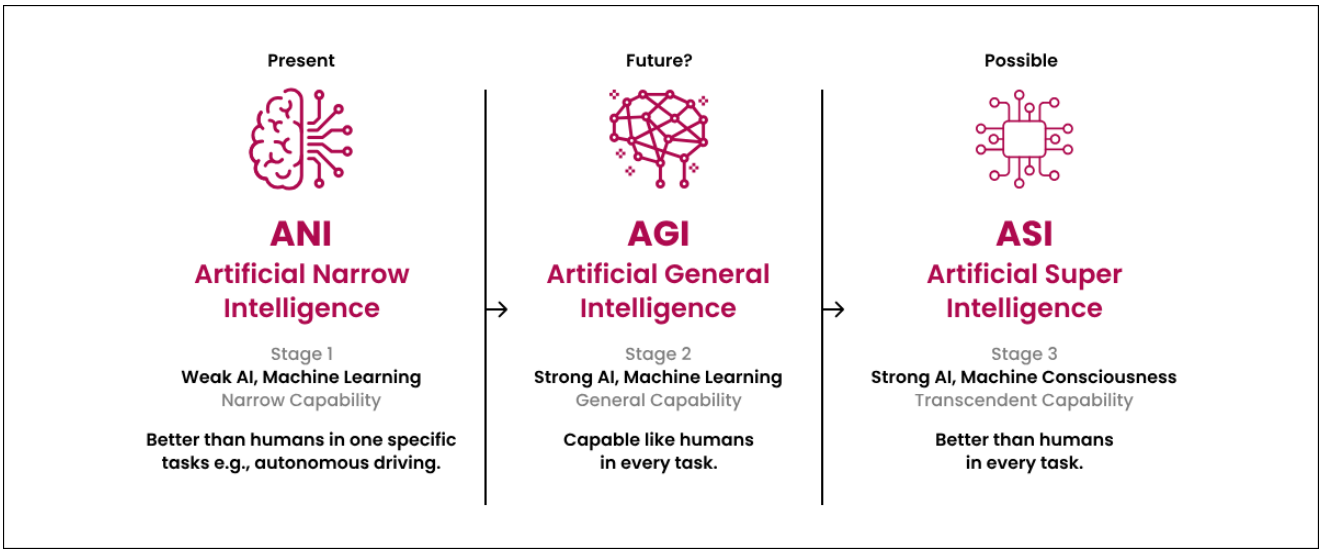
🤖 Introduction to Artificial Intelligence

Artificial Intelligence (AI) is the science of building systems that simulate human intelligence — like reasoning, learning, and decision-making.

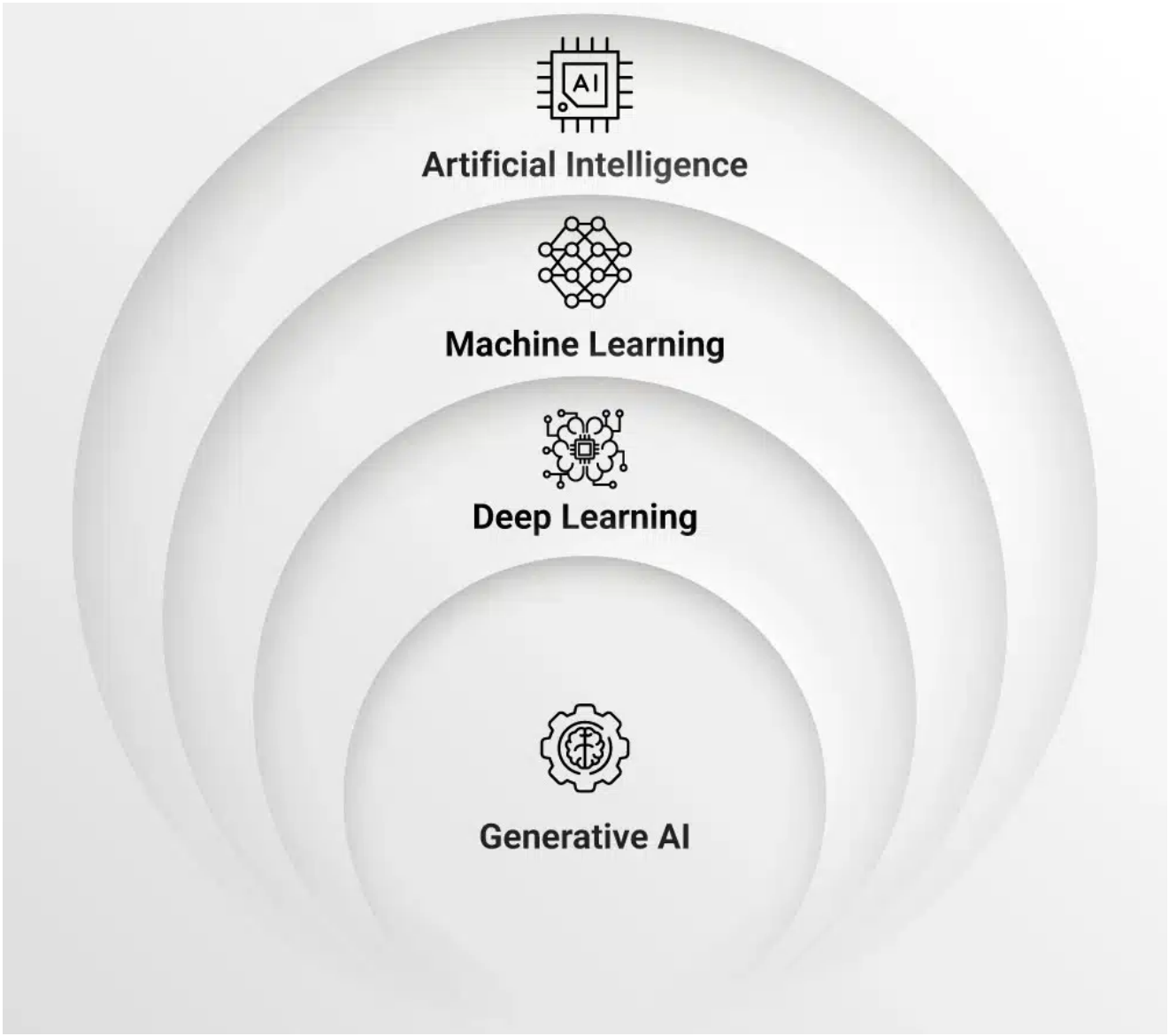
Ai Stages :



◇ AGI (Artificial General Intelligence)

A future goal: machines with **human-level intelligence**, able to learn and adapt across any task.
Status: Not yet achieved.

🧠 Ai subsets (layers) :



◇ AI (Artificial Intelligence)

The broadest field — includes any system that mimics human thinking (rules or data-driven).
Examples: Virtual assistants, self-driving tech.

◇ ML (Machine Learning)

A subset of AI — systems that **learn from data** to predict or decide.
Examples: Spam filters, recommendations.

◇ DL (Deep Learning)

A subset of ML — uses **neural networks** for complex tasks like image or speech recognition.
Examples: Face ID, language translation.

◇ Generative AI

A branch of DL — creates new content like **text, images, or code**.
Examples: ChatGPT, DALL·E, GitHub Copilot.

Summary Table

Term	Type	What it Does	Example
AI	Broad concept	Simulates intelligence	Siri, automation
AGI	Future goal	Learns & thinks like humans	Still under research
ML	Subset of AI	Learns from data	Fraud detection
DL	Subset of ML	Uses neural networks	Image/speech recognition
GenAI	Subset of DL	Generates content	ChatGPT, DALL·E