Machine Learning Algorithm Summary Sheet

Tech/AI – Infographic-Style Overview

Supervised Learning

- Learns from **labeled data**
- Used for:
    - Regression (predicting continuous values)
    - Classification (predicting categories)
- Examples:
    - Linear Regression
    - Random Forest
    - Support Vector Machines (SVM)

Unsupervised Learning

- Works with **unlabeled data**
- Discovers hidden patterns, clusters, or structures
- Examples:
    - K-Means
    - PCA (Principal Component Analysis)
    - Hierarchical Clustering

Reinforcement Learning

- Learns by **interacting with an environment**
- Receives rewards or penalties
- Examples:
    - Q-Learning
    - Deep Q Networks (DQN)
    - Game-playing agents & robotics

Comparison Table

Aspect	Supervised Learning	Unsupervised Learning	Reinforcement Learning
Data Type	Labeled	Unlabeled	Environment + Rewards
Main Goal	Predict specific outcomes	Find hidden patterns	Maximize reward over time
Examples	Classification, Regression	Clustering, PCA	Q-Learning, DQN

Key Takeaways

- Use **Supervised Learning** when target labels are known
- Use **Unsupervised Learning** when exploring structure
- Use **Reinforcement Learning** for sequential decisions & agents