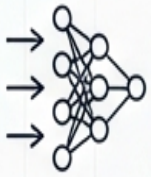
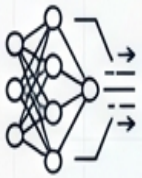
INTRODUCTION TO NEURAL NETWORKS

- Brain-inspired machine learning model
- Composed of interconnected neurons
- Enables pattern recognition

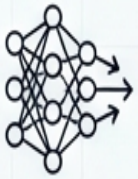
Key Components



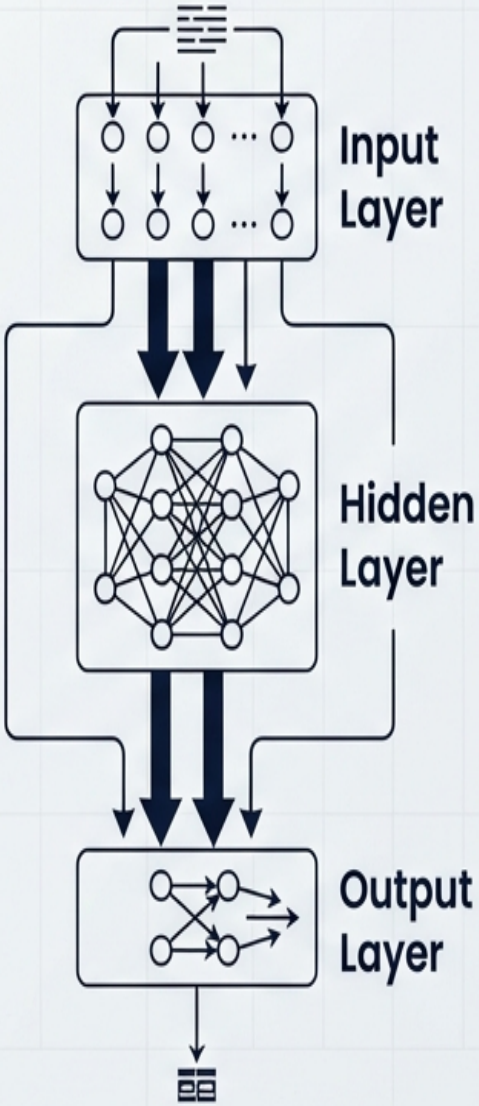
- **Input Layer** – receives data



- **Hidden Layer** – processes & extracts features

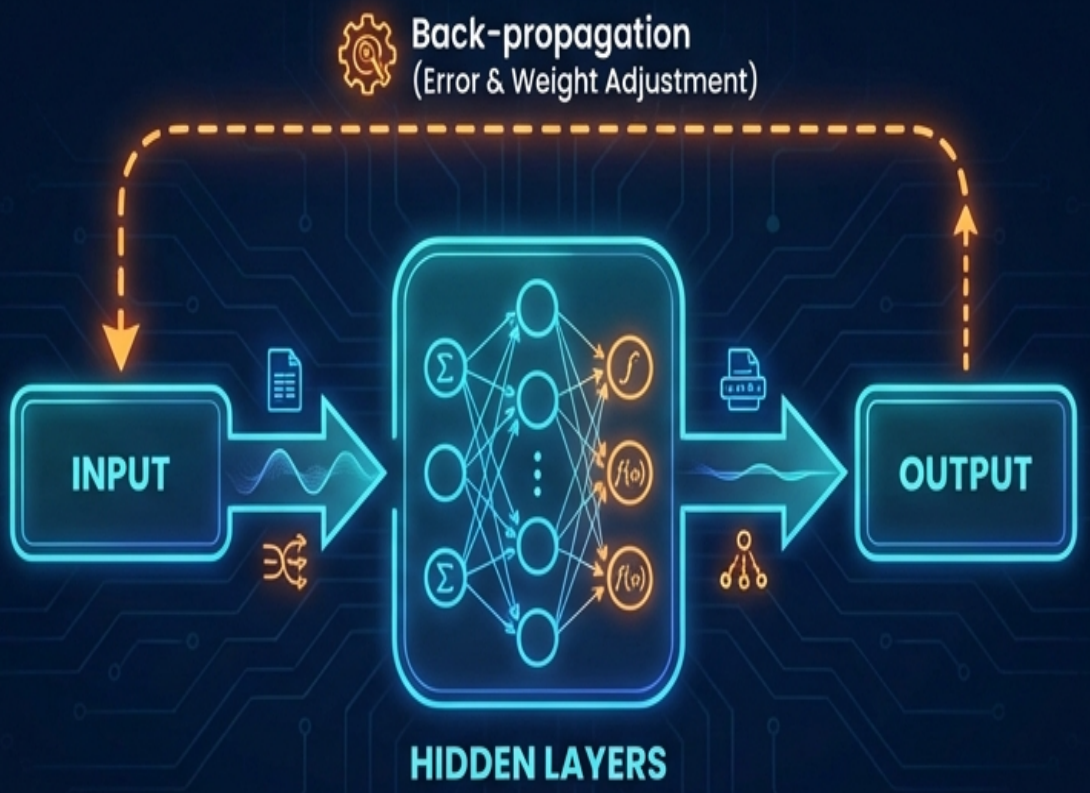


- **Output Layer** – produces predictions



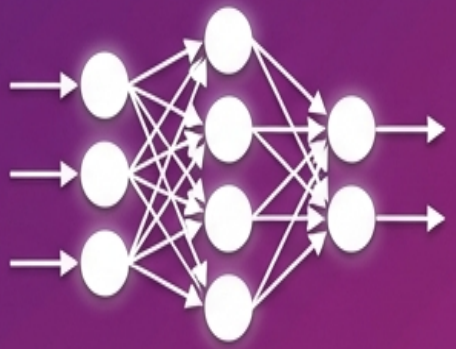
How Neural Networks Work

1. Input → Forward Propagation
2. Activation functions shape signals
3. Back-propagation tunes weights



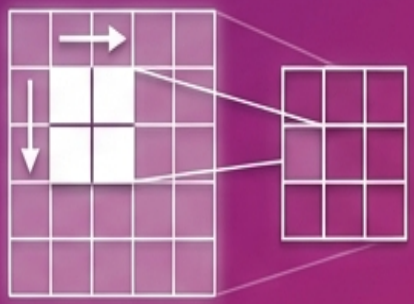
Common NN Architectures

- **Feed-forward** – single-direction flow



- **Recurrent** – loops for sequence data

- **Convolutional** – spatial feature extraction



Applications & Takeaway

- Image & speech recognition
- Natural language processing & generation
- Predictive modeling (finance, weather)