COMPETITIVE LEARNING NETWORKS

Only the winning neuron (best match) gets updated

WHAT IS A COMPETITIVE LEARNING NETWORK?

- A type of unsupervised neural network
- Neurons compete to become the winner
- The winning neuron adjusts its weights

HOW IT WORKS (STEP BY STEP)

1. Input is given to the network
2. Each neuron computes similarity
3. Neuron closest to input becomes the winner
4. Winner updates its weights to learn

EXAMPLE 1: GROUPING STUDENTS BY STUDY HABITS

- Students with study hours: A=2, B=4, C=9
- Network with 2 neurons
- Neuron 1 wins for A & B (low hours)
- Neuron 2 wins for C (high hours)

✓ Clusters formed automatically

EXAMPLE 2: COLOR RECOGNITION

- Inputs: RGB color values
- Network with 2 neurons
- Neuron 1: Warm colors (red, orange, yellow)
- Neuron 2: Cool colors (blue, green, purple)

✓ Network self-organizes into categories

KEY FEATURES

- Unsupervised learning (no labels needed)
- Produces clusters automatically
- Inspired by biological brain mechanisms

APPLICATIONS

- Customer segmentation
- Speech recognition
- Image compression