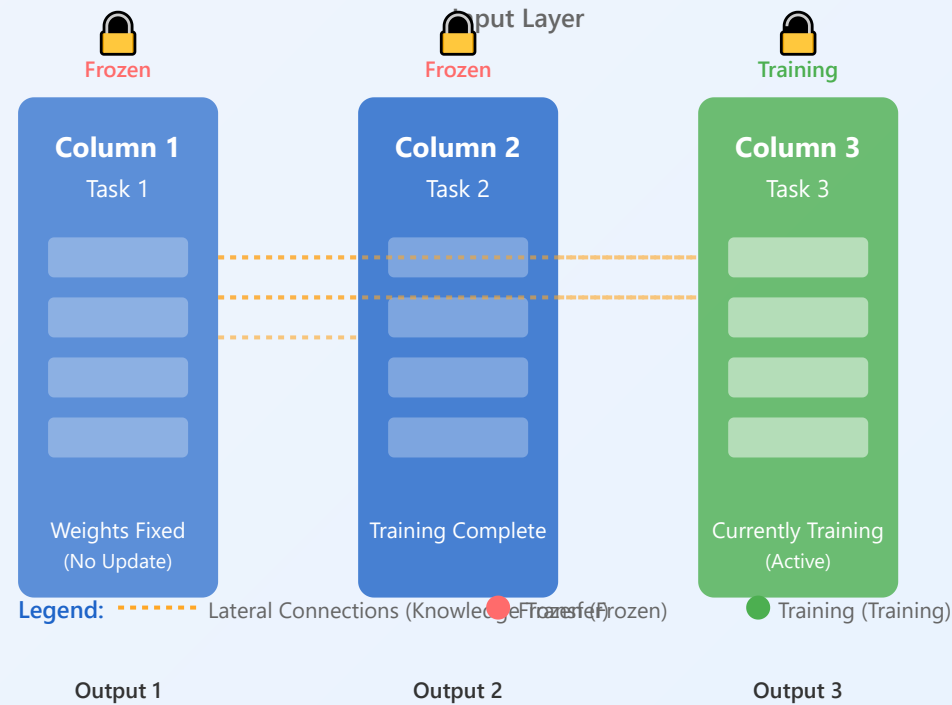


Progressive Neural Networks (PNN)



PNN Network Architecture (Progressive Expansion)



■ PNN Architecture

- Column Architecture: Add new network column for each task
- Lateral Connections: Transfer features from previous columns

- Frozen Columns: Freeze previous task weights
- Adapter Layers: Transform features between tasks

Expansion Process

- Step 1: Initial task learning (Column 1)
- Step 2: Add Column 2 for new task
- Step 3: Knowledge transfer via lateral connections
- Step 4: Continue expanding with additional columns as needed



Pros and Cons

- Pros: Complete forgetting prevention, knowledge transfer possible
- Pros: Minimize inter-task interference
- Cons: Linear model size growth
- Cons: Increased memory and computational cost