Recurrent Neural Networks (RNNs)

1. **Theoretical Overview**

# What is an RNN?

A **Recurrent Neural Network (RNN)** is a type of neural network designed to handle **sequential data**. Unlike traditional feedforward neural networks, RNNs have **loops** allowing information to persist, making them suitable for tasks like:

* + Text generation
  + Sentiment analysis
  + Machine translation
  + Speech recognition

# Key Idea

RNNs process sequences **one element at a time**, maintaining a hidden state that contains information from previous time steps. This allows RNNs to learn **temporal dependencies** in the data.

OR

## What are RNNs?

Recurrent Neural Networks (RNNs) are designed for sequential data (e.g., time series, text, speech). Unlike feedforward networks, RNNs have loops to retain information from previous steps, enabling them to model temporal dependencies.

## Key Features

Hidden State: A memory component capturing information from past inputs. Shared Parameters: The same weights are reused across all time steps.

Applications

Text generation, machine translation, speech recognition. Time series prediction (stock prices, weather).











