

Recurrent Neural Networks



What is an *artificial* neural network?

- Machine learning framework
- Mimics the learning pattern of the brain's neural networks

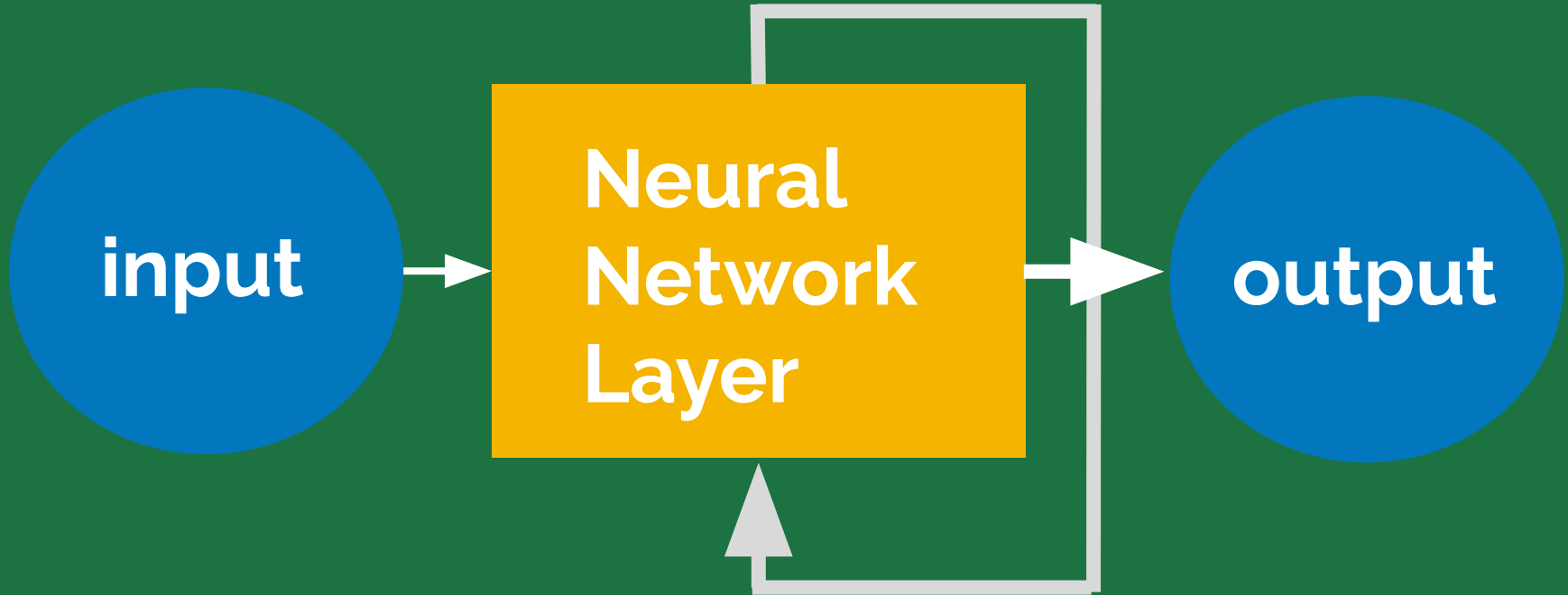
What is a *natural* neural network?

- Interconnected neurons that receive inputs
- Produce output signal through an axon to another neuron

How do you *build* a neural network?

- Input layer takes in feature inputs
- Add hidden layers
- Output layer makes outputs

Recurrent Neural Network



Recurrent Neural Networks

- Networks with loops
- Connect previous information for current understanding
- Example: Knowledge of words to understand this sentence

Recurrent neural networks

- Allow information to persist
- Use previous reasoning for future reasoning

Recurrent neural networks

- Pass messages in a chain
- Architecture suitable for sequences and lists

Types

- **Some only need recent information**
- **Others need long-term memory**
- **This can be difficult**

Long Short Term Memory Networks

- Type of Recurrent Neural Network
- Capable of long-term dependencies

Long Short Term Memory Structure

4 interacting layers

- Forget gate layer (info to throw away)
- Input gate layer (new information)
- Update previous cells layers
- Output layer

Recurrent Neural Networks ✓

**Let's
begin...**