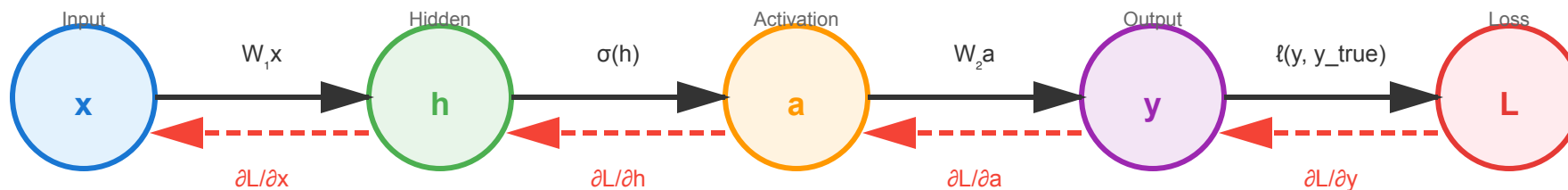


# Backpropagation Computational Graph

Forward Pass →



## Complexity

$O(n)$  for  $n$  operations

## Chain Rule Application

$$\frac{\partial L}{\partial W_1} = \frac{\partial L}{\partial h} \times \frac{\partial h}{\partial W_1}$$

## Key Insight

Each edge traversed exactly once

← **Backward Pass (Backpropagation)**

*Forward pass computes outputs; backward pass computes gradients using chain rule*