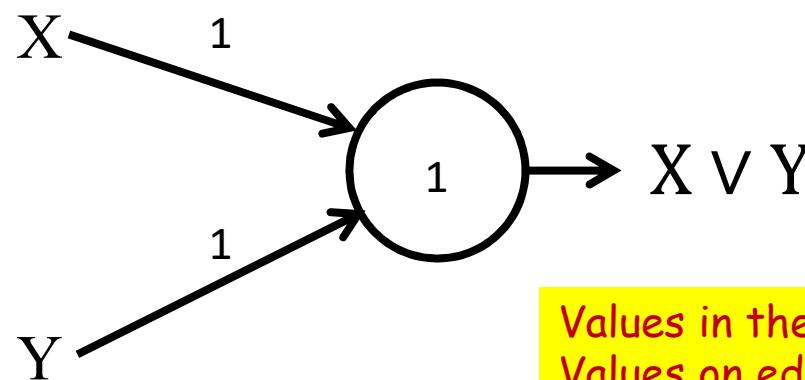
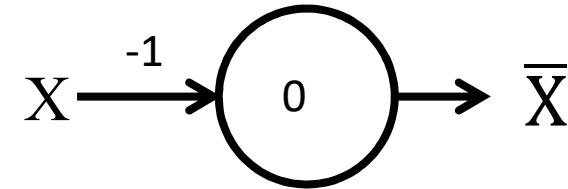
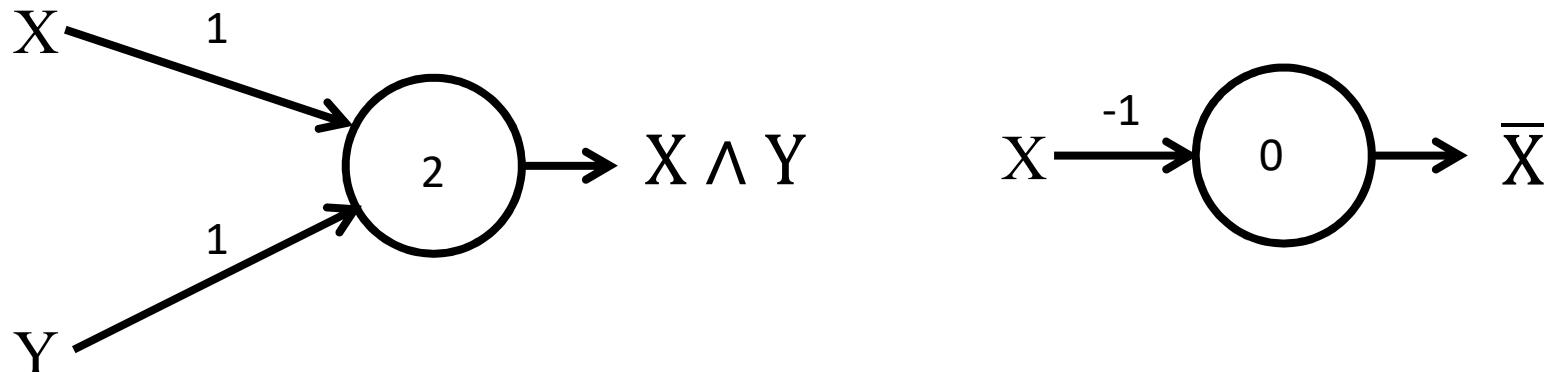


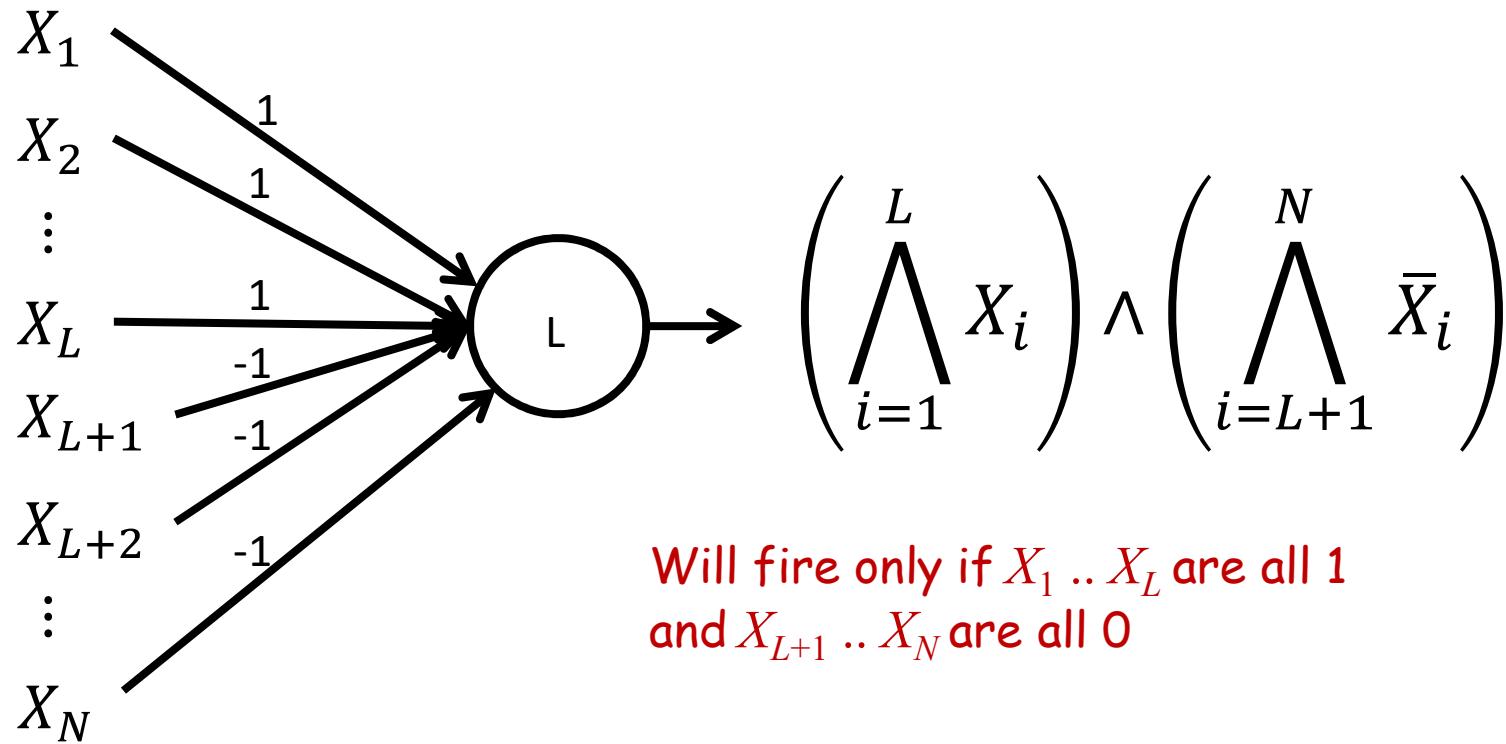
The perceptron as a Boolean gate



Values in the circles are thresholds
Values on edges are weights

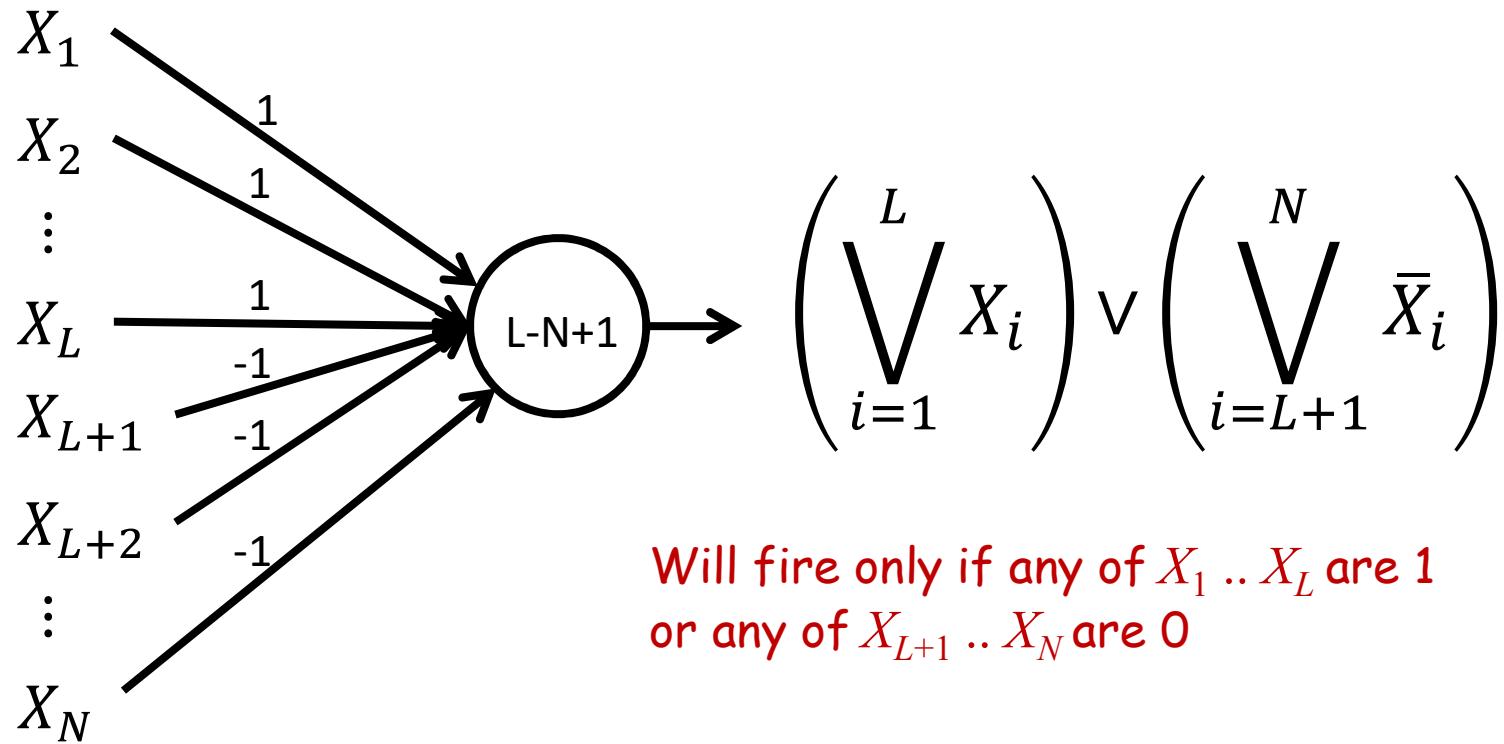
- A perceptron can model any simple binary Boolean gate

Perceptron as a Boolean gate



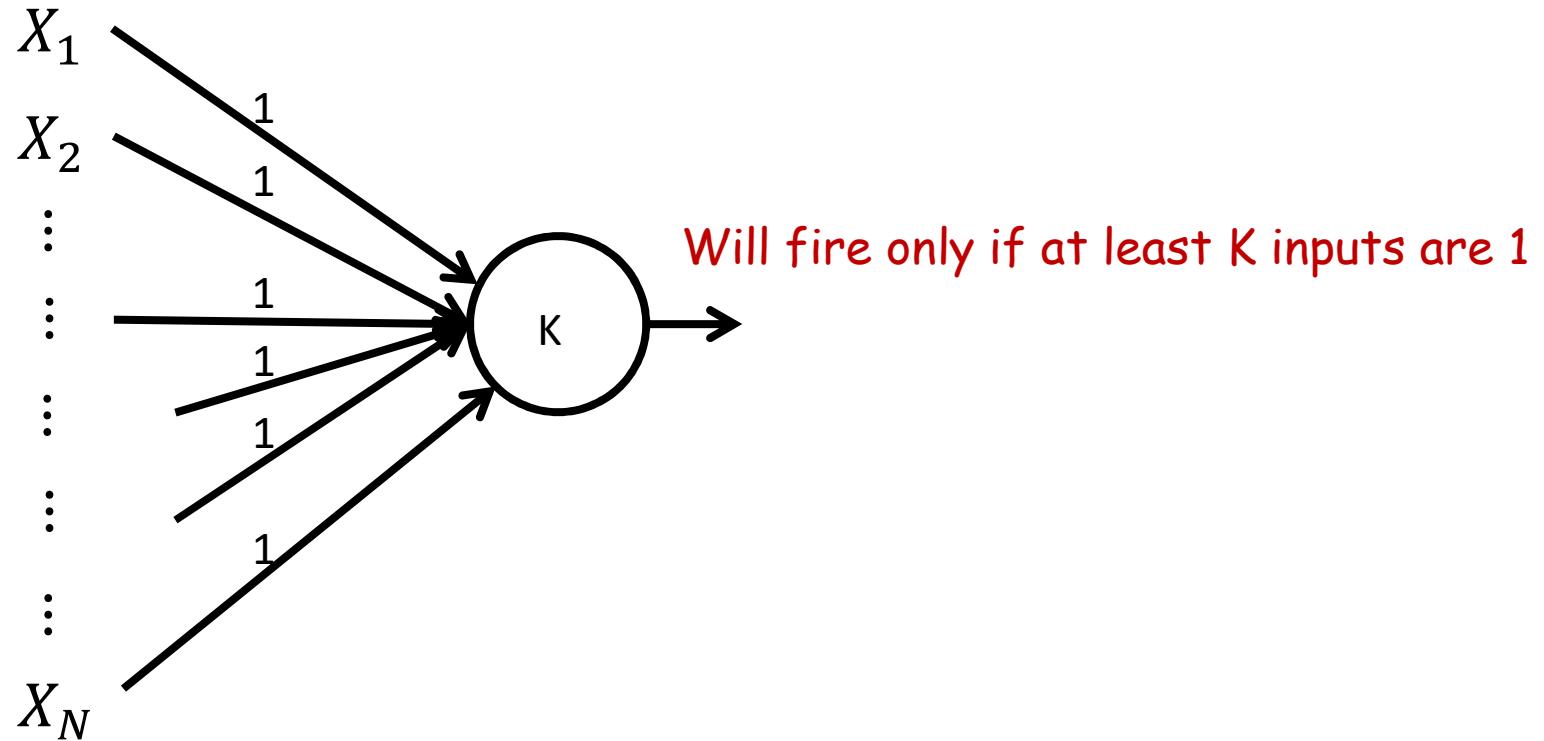
- The universal AND gate
 - AND any number of inputs
 - Any subset of who may be negated

Perceptron as a Boolean gate



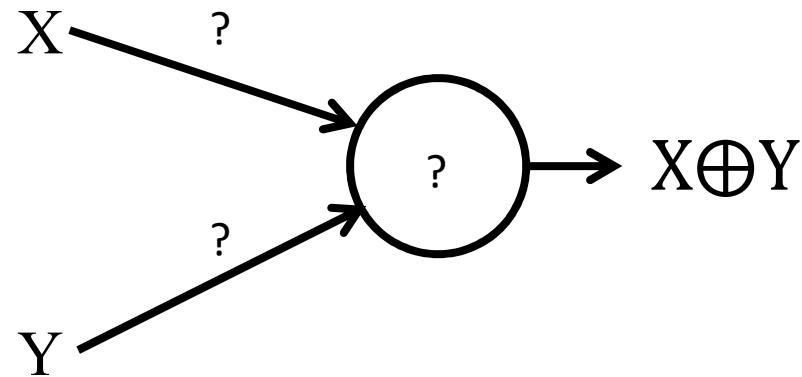
- The universal OR gate
 - OR any number of inputs
 - Any subset of who may be negated

Perceptron as a Boolean Gate



- Generalized *majority* gate
 - Fire if at least K inputs are of the desired polarity

The perceptron is not enough

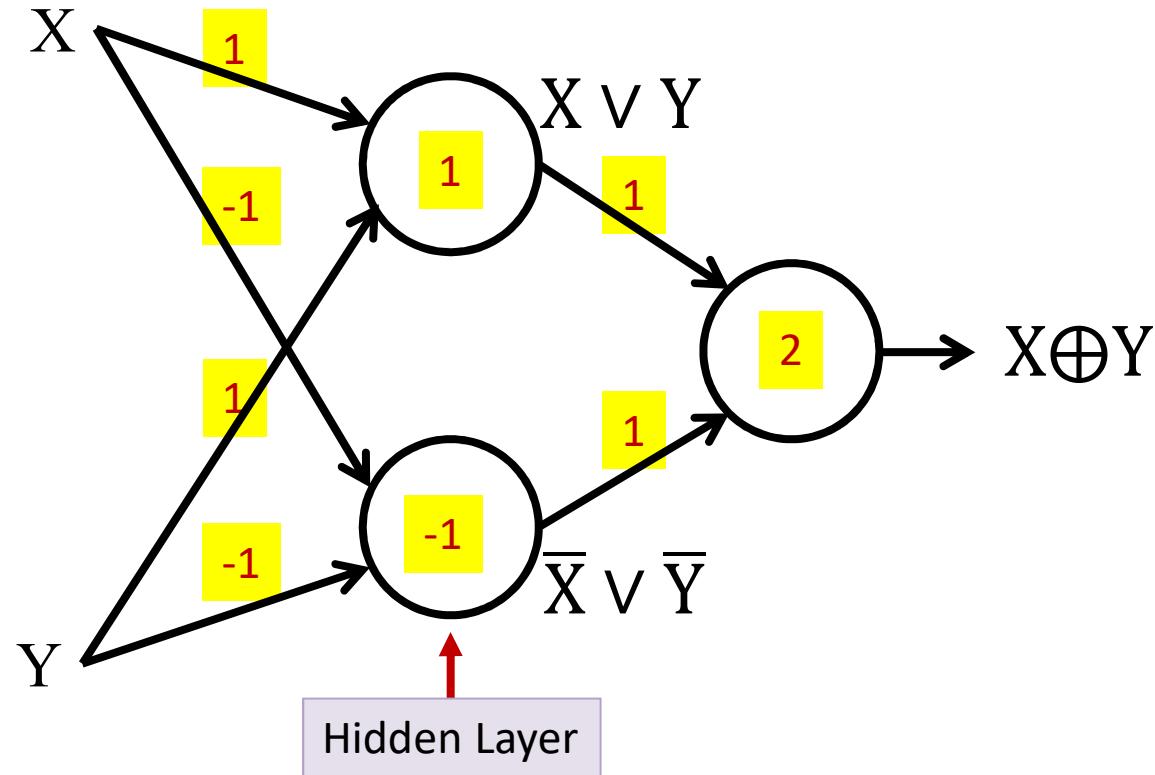


- Cannot compute an XOR

The MLP as a Boolean function

- How well do MLPs model Boolean functions?

Multi-layer perceptron



- MLPs can compute the XOR