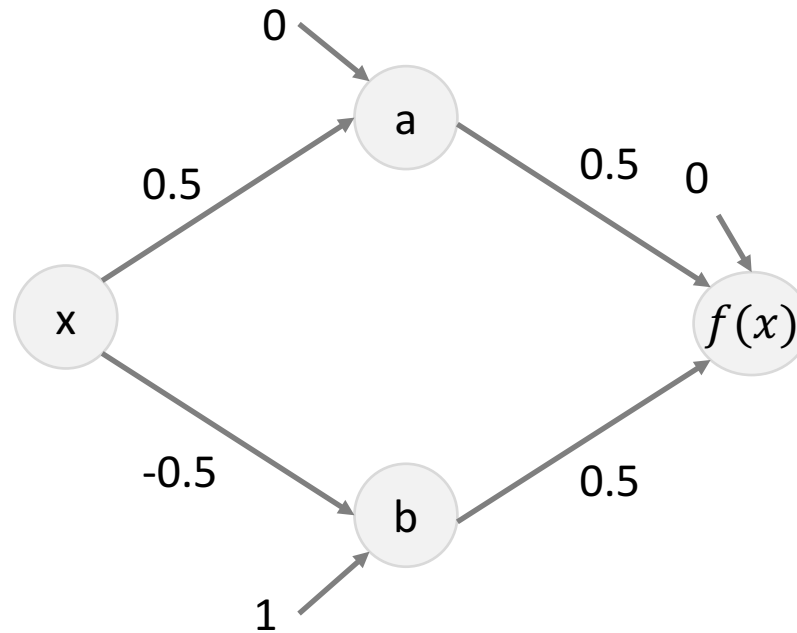
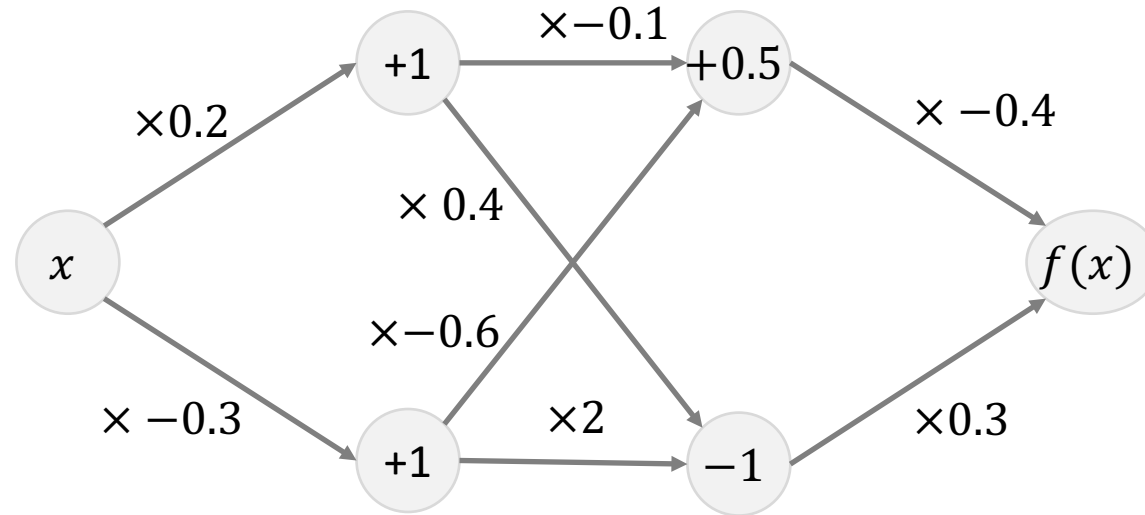


Interval Analysis of Fully-Connected Neural Networks



- 1) Evaluate the network f for inputs $x_1 = 1$ and $x_2 = 2$
- 2) Compute the set of possible outputs for any inputs from the set $\{x \mid x \in [1, 2]\}$
- 3) Use interval analysis to compute the possible outputs for the input set: $\{x \mid x \in [1, 2]\}$
- 4) Are there any spurious outputs due to over-approximation?
- 5) Can interval analysis prove the property that $(1 \leq x \leq 2) \Rightarrow (f(x) \geq 0.5)$

Bigger Example



- 1) Do interval analysis for input sets:
 $\{x \mid x \in [0.2, 0.3]\}$ and $\{x \mid x \in [1, 1.3]\}$
- 2) Is your interval analysis precise for these input sets?