

### Feedforward ( $\vec{x}$ )

- Given weight matrices  $W^2, \dots, W^L$  and bias vectors  $\vec{b}^2, \dots, \vec{b}^L$  of each layer,
- Declare vars:
  - $A$ , the list of activations for each layer
  - $\vec{a}$ , the activations in current layer
  - $\vec{a}'$ , the activations from previous layer
  - $\vec{z}$ , intermediary weighted sum in current layer
- Add  $\vec{x}$  to  $A$
- $\vec{a}' = \vec{x}$
- For each  $\vec{b}, W$  in bias, weights:
  - $\vec{z} = W\vec{a}' + \vec{b}$
  - $\vec{a} = \sigma(\vec{z})$
  - Add  $\vec{a}$  to  $A$
  - $\vec{a}' = \vec{a}$
- Return  $A$

### Classify ( $\vec{x}$ )

- Declare vars:
  - $\vec{a}$ , the activations in the last layer after feeding forward  $\vec{x}$
  - $y$ , the classification
- $\vec{a}$  = last item in Feedforward ( $\vec{x}$ )
- $y = \underset{i}{\operatorname{argmax}} \vec{a}$
- Return  $y$