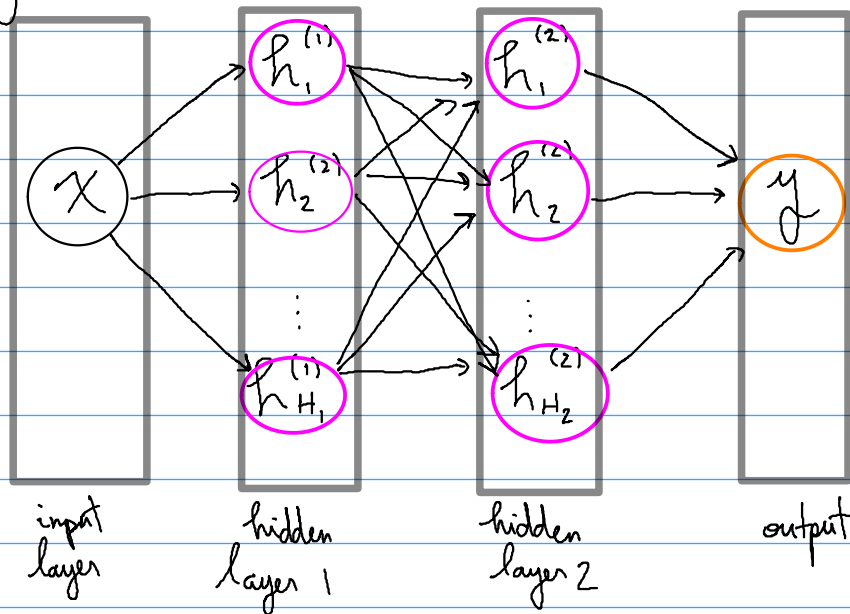


Artificial Neural Networks

$$F: \underset{\substack{\uparrow \\ \text{features}}}{X} \longrightarrow \underset{\substack{\uparrow \\ \text{output}}}{y}$$

- Fully-connected neural net:



$$\begin{aligned} n_{\text{Layers}} &= 2 \\ n_{\text{Nodes}} &= H_1 = H_2 \end{aligned}$$

$$h_j^{(i)} = g \left(w_j^{(i)} X + b_j^{(i)} \right), \quad i=1, 2, \dots$$

Diagram illustrating the calculation of hidden layer output $h_j^{(i)}$:

- g is the activation function (non-linear).
- $w_j^{(i)}$ are the weights.
- $b_j^{(i)}$ is the bias.

$$y = f \left(w_y X + b_y \right)$$

Diagram illustrating the calculation of output y :

- f is the activation function.
- w_y are the weights.
- b_y is the bias.

- NB: ANNs can be multidimensional, use different activation function, and others hyperparameters.