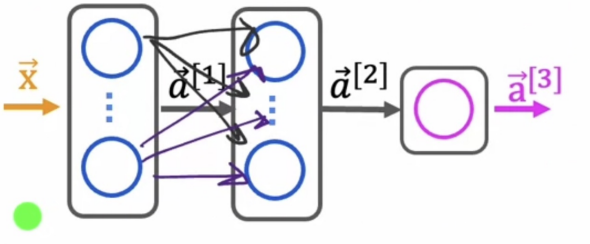
There are different layer types in a neural network.

Dense Layer

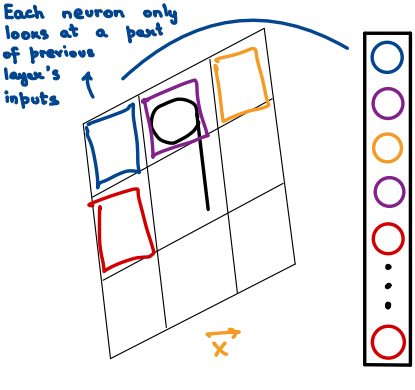
The conventionally used layer. In this type of layer each neuron output is a function of all the activation outputs of the previous layer.



$$\vec{a}_1^{[2]} = g\left(\vec{w}_1^{[2]} \cdot \vec{a}^{[1]} + b_1^{[2]}\right)$$

$\vec{a}^{[1]}$: output of previous layer

Convolutional Layer



, $\vec{x}$ is an input with handwritten digit 9.

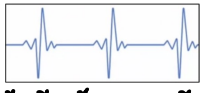
Looking at only a region of input image is called a convolutional layer.

→ Faster computing
→ Needs less training data

Convolutional layer is primarily used for image classification, object detection and image segmentation.

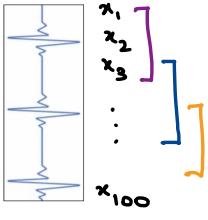
It is faster and requires less training data (lessens problems of overfitting) because it doesn't need to look at every part of the input

eg. EKG → correspond to heartbeat



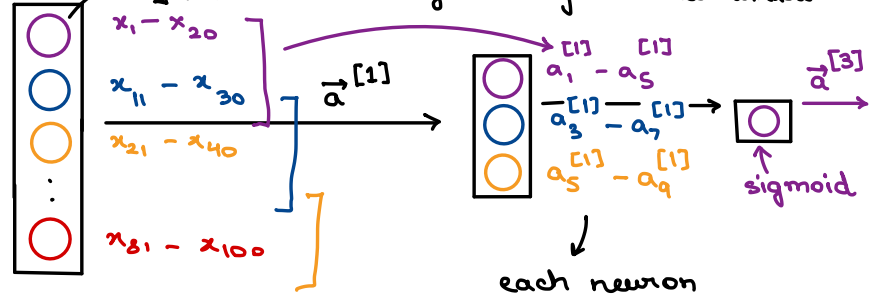
what if we want to diagnose if a person has heart issues?

rotate 90° to have it like an array



convolutional layer

this neuron looking at only a small window



each neuron looks only at a part of activations from previous layer

Summarising, in some cases a convolutional layer works better because you have control over the architecture of the network such as choosing how big is the window of inputs each neuron should have, etc.