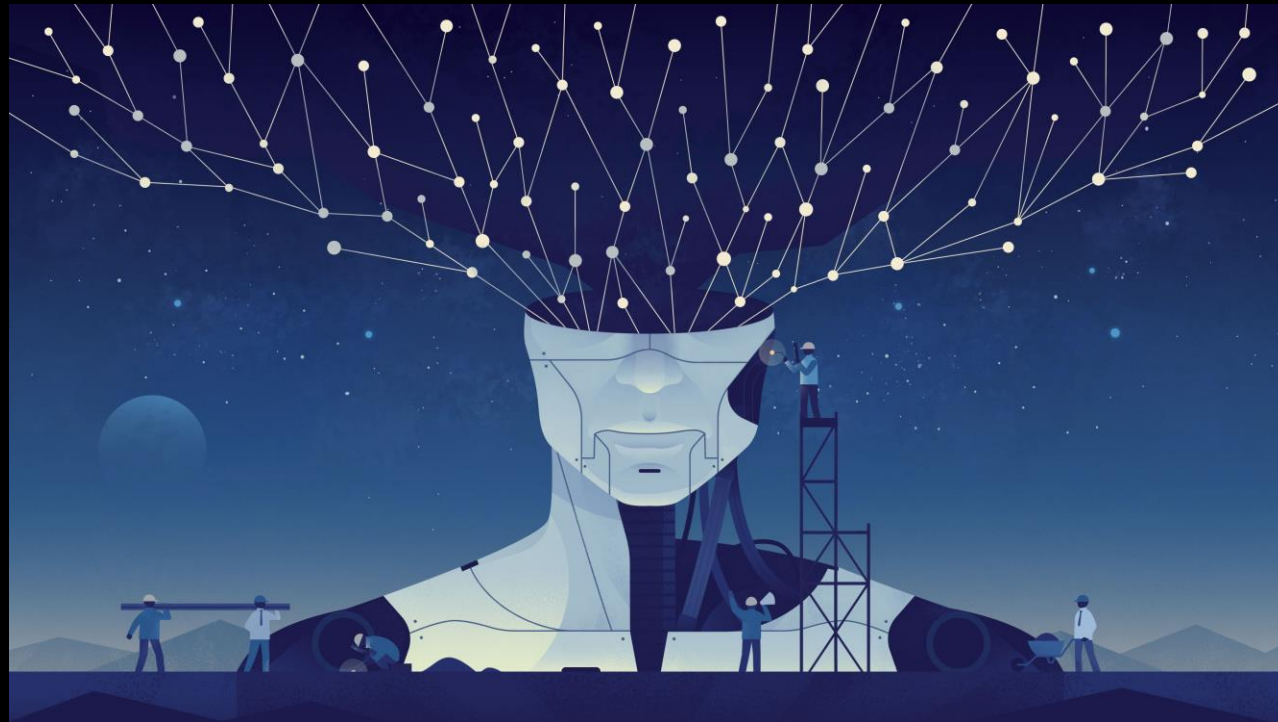


A very brief introduction to **Neural Networks**



Picture by: <https://www.quantamagazine.org/foundations-built-for-a-general-theory-of-neural-networks-20190131/>

What are Neural Networks?

Network of neurons.

Mathematical tool able to map heavily non linear functions.

“Mimicks how the human brain works”.

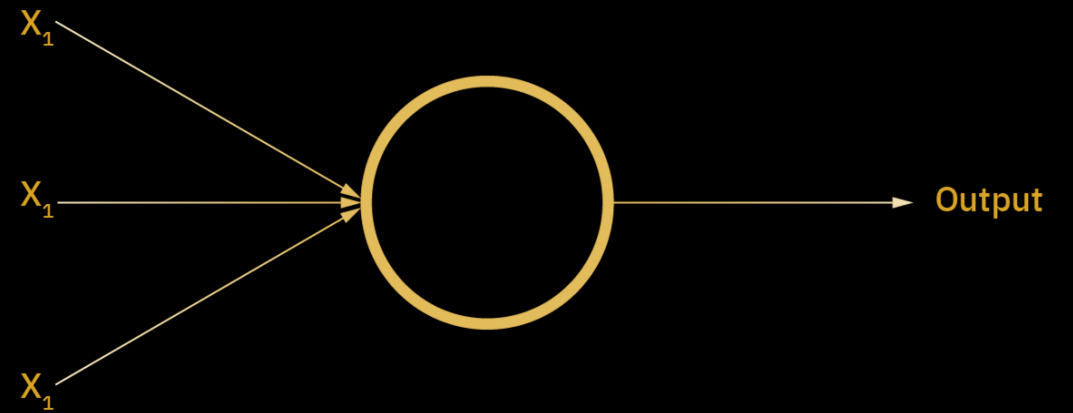
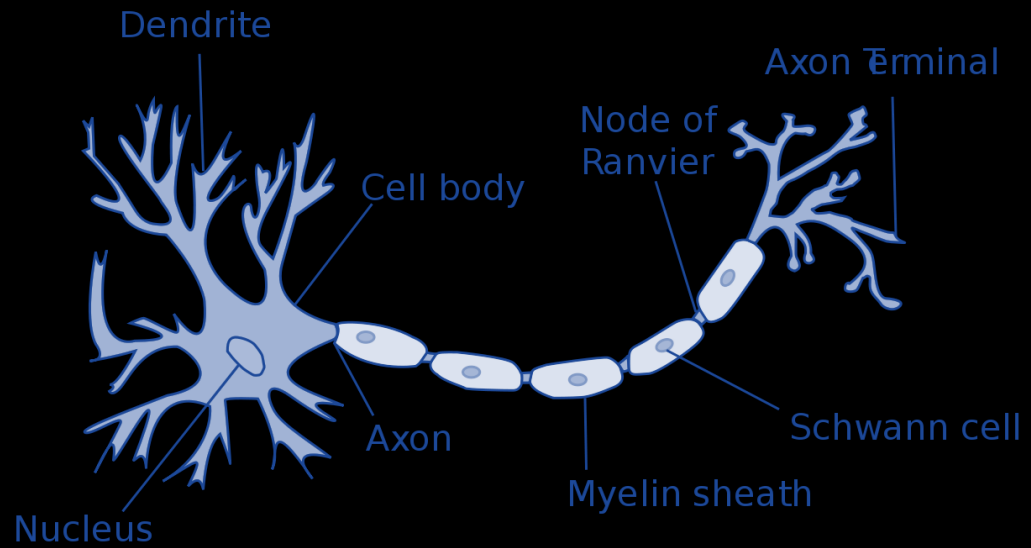
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What is a neuron?

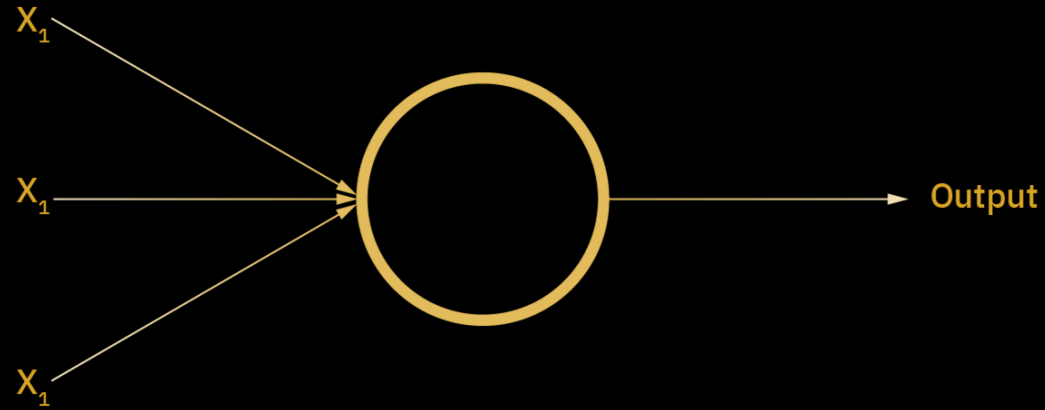


What does a mathematical neuron do?



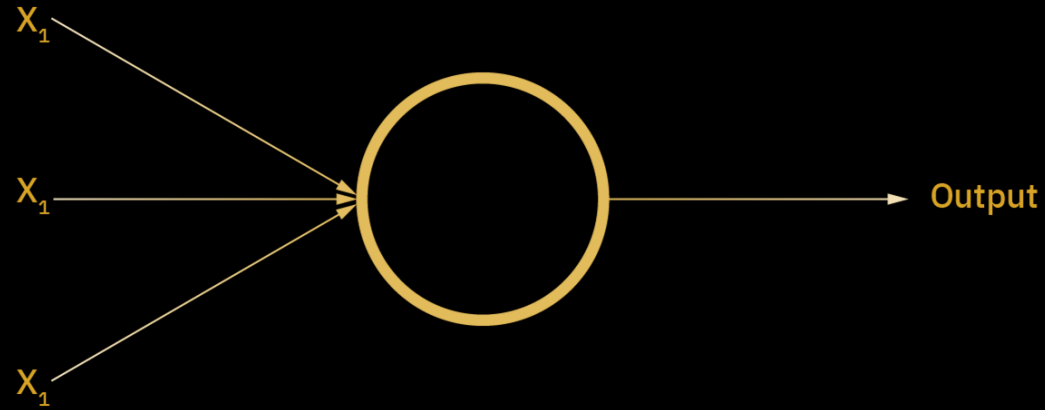
x_i

What does a mathematical neuron do?



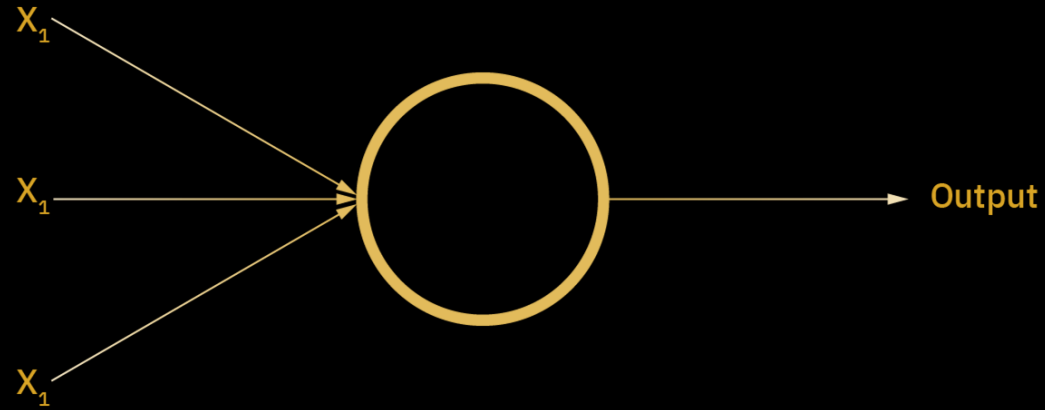
$$w_i X_i$$

What does a mathematical neuron do?



$$\sum w_i X_i$$

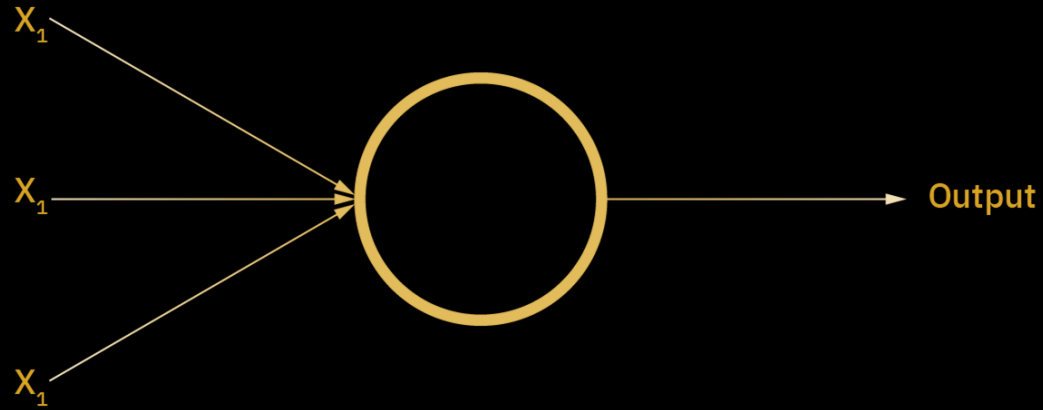
What does a mathematical neuron do?



Parameters

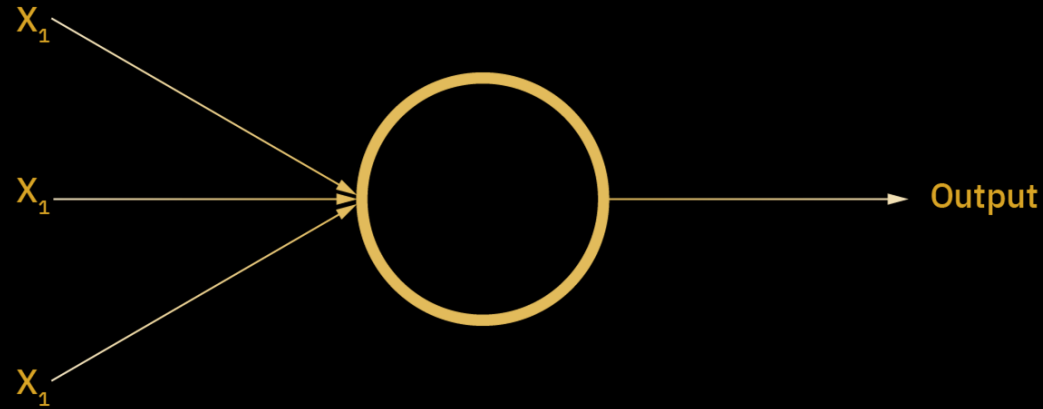
$$\sum w_i X_i + b$$

What does a mathematical neuron do?



$$\text{Output} = f(\sum w_i X_i + b)$$

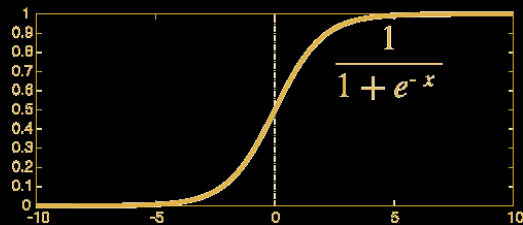
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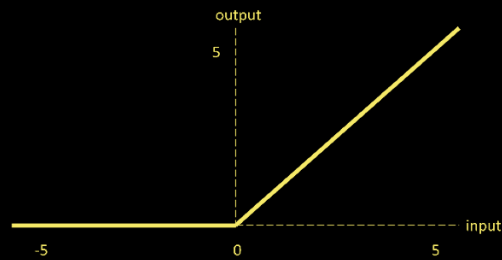
$$\text{Output} = f(\sum w_i X_i + b)$$

Where $f(x)$:

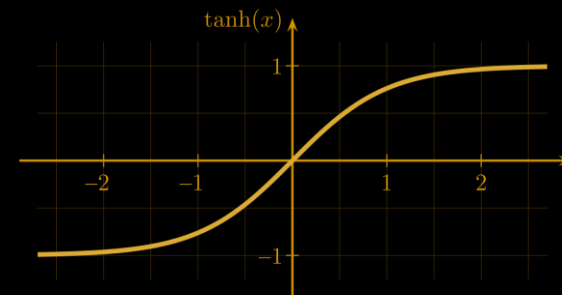
Sigmoid



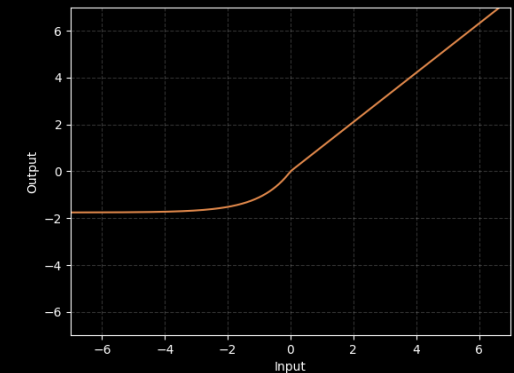
Relu



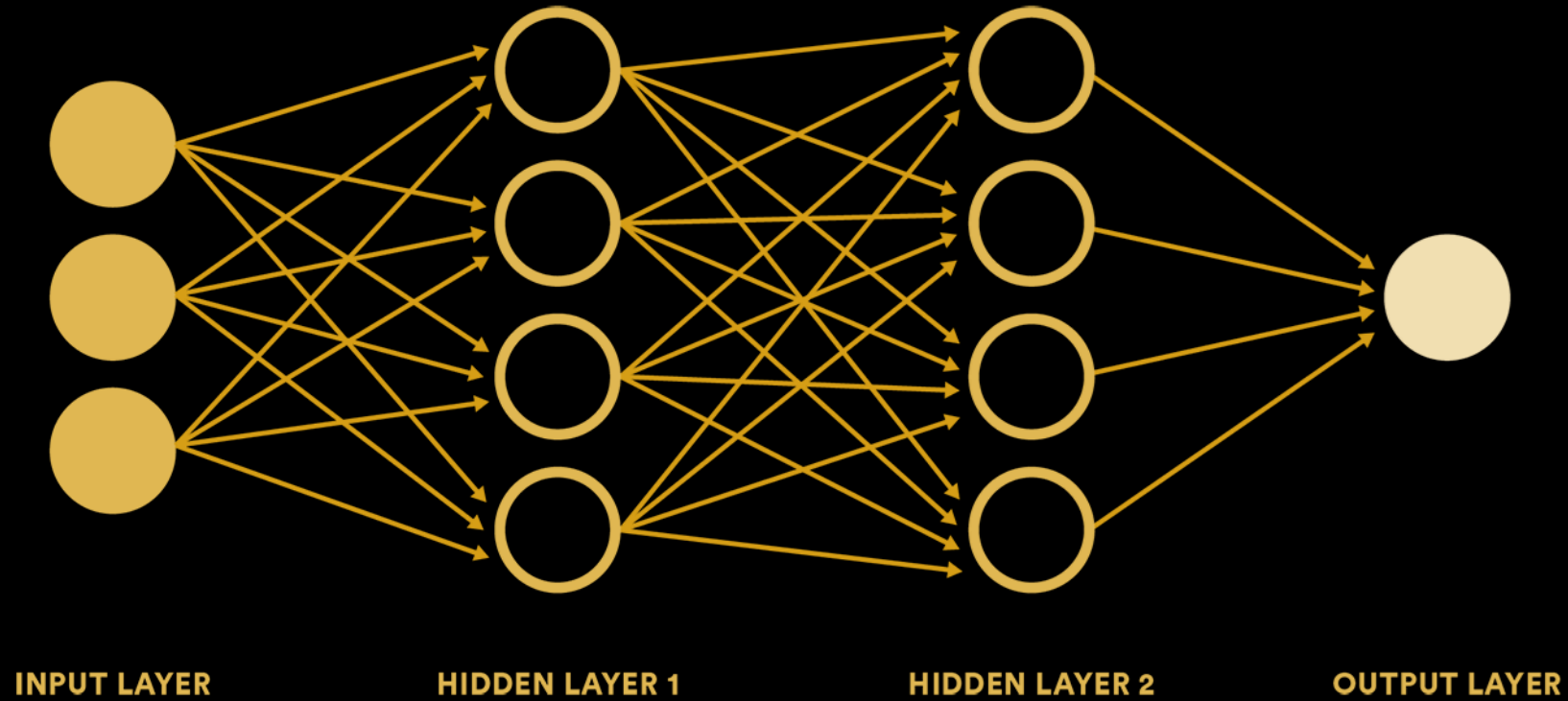
Tanh



Selu



What does the network bring?



3 layers NN

What data can NN tackle?

Timeseries

Audio

Text

Images

...

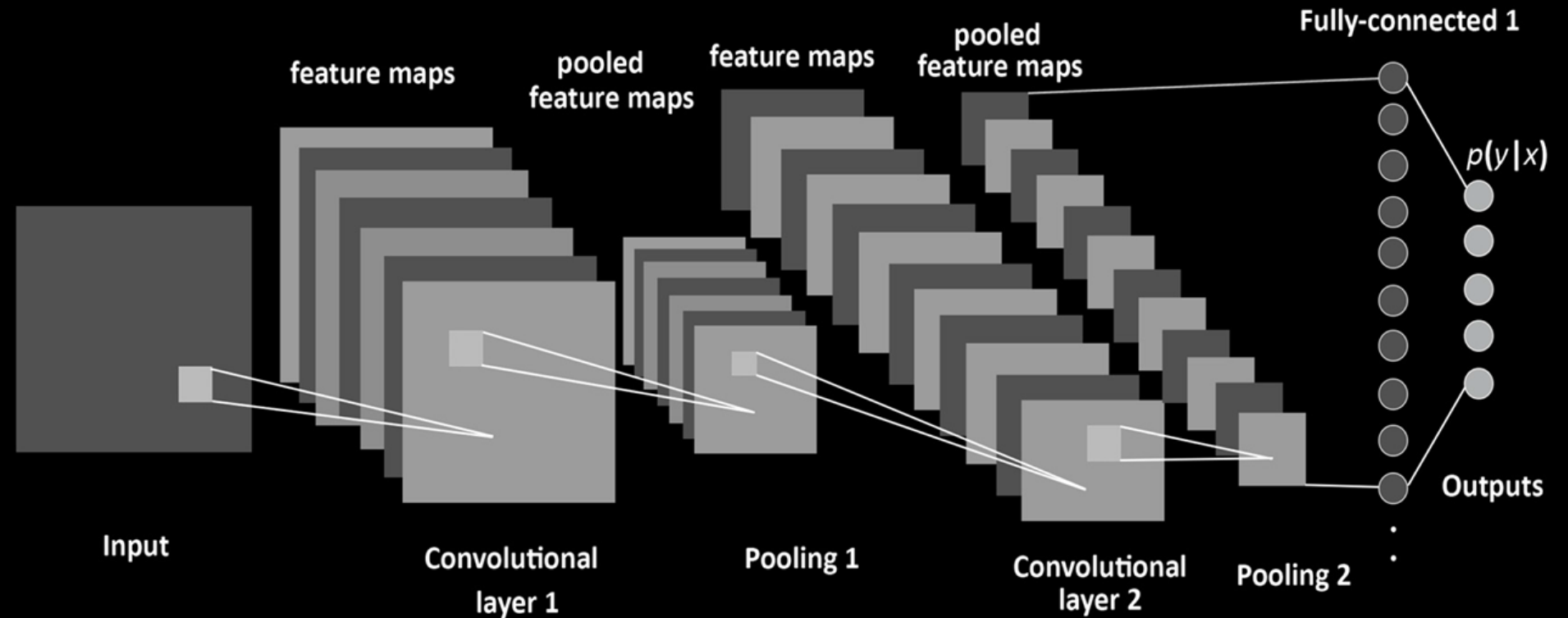
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<https://www.mdpi.com/1099-4300/19/6/242>

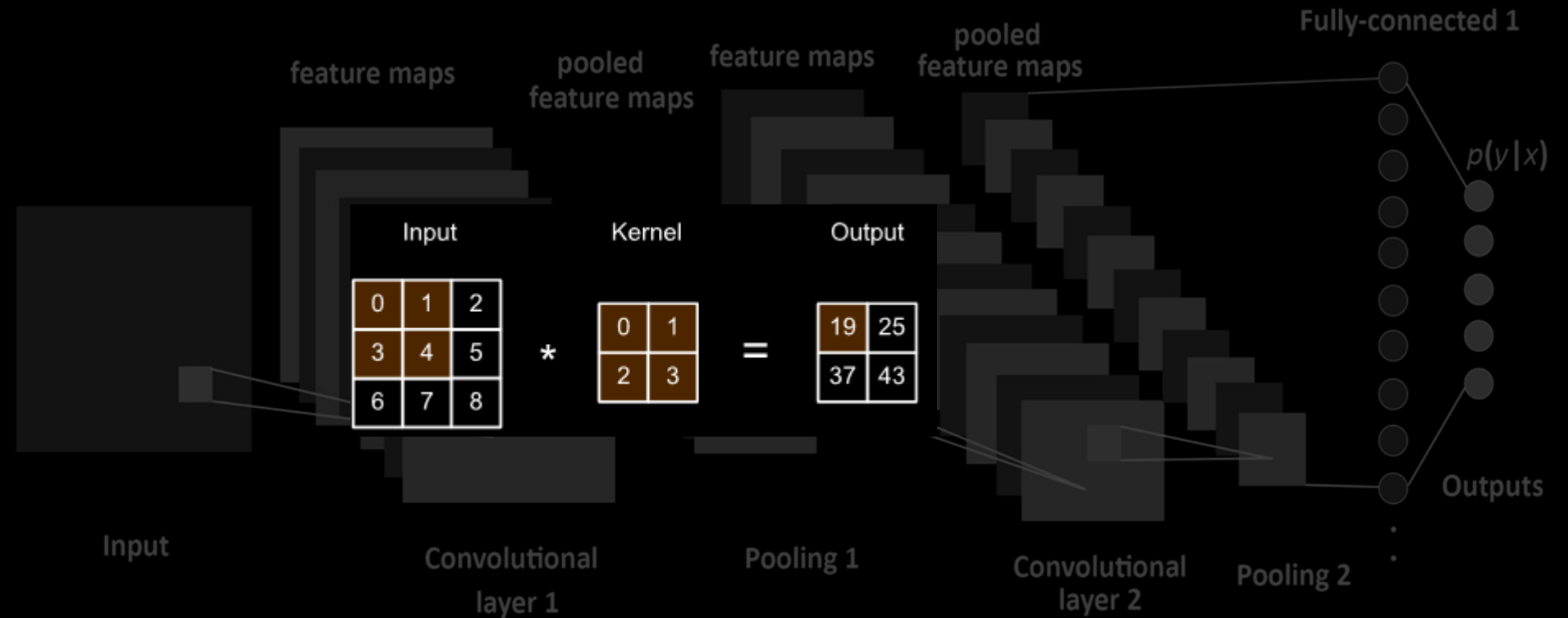
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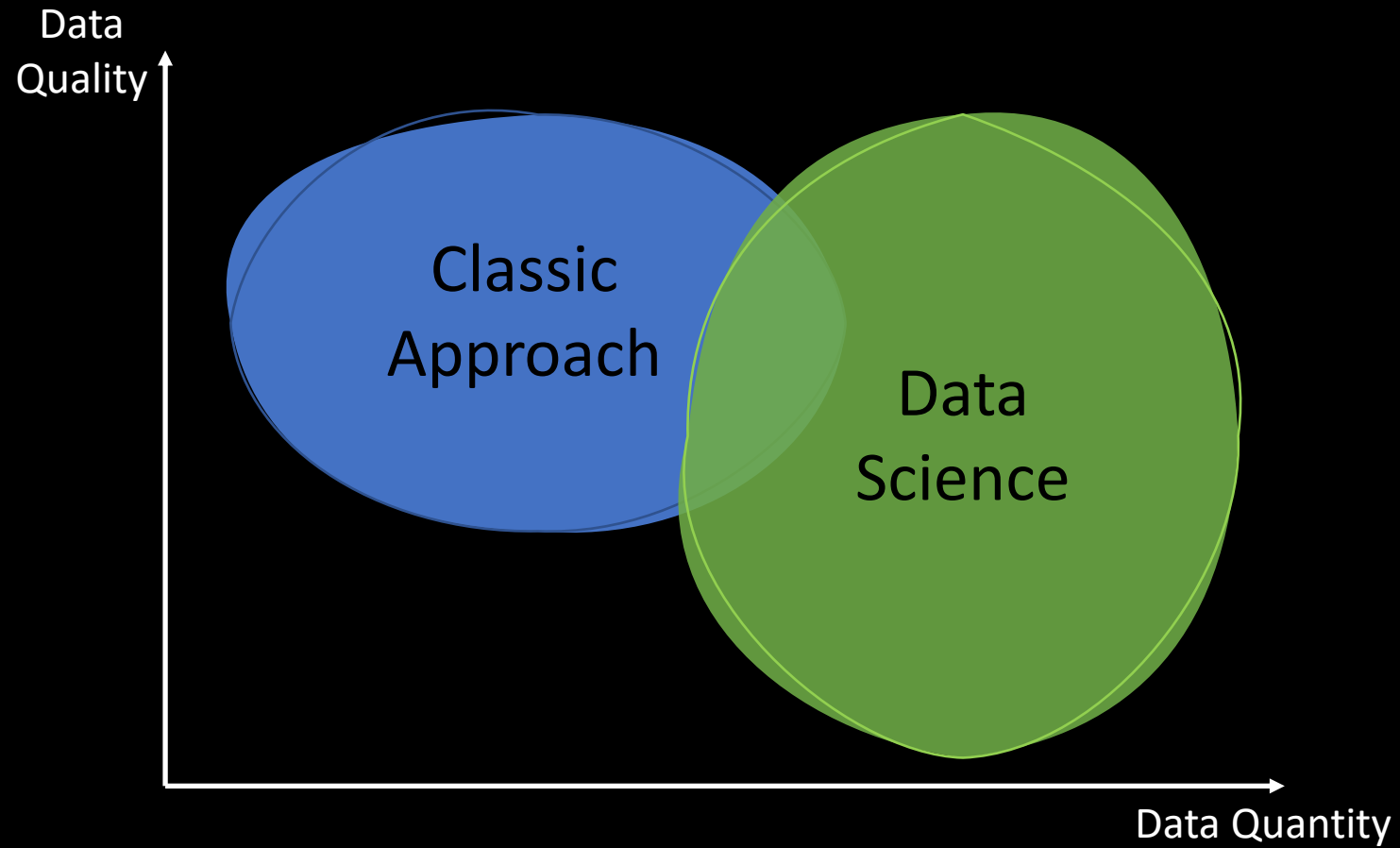
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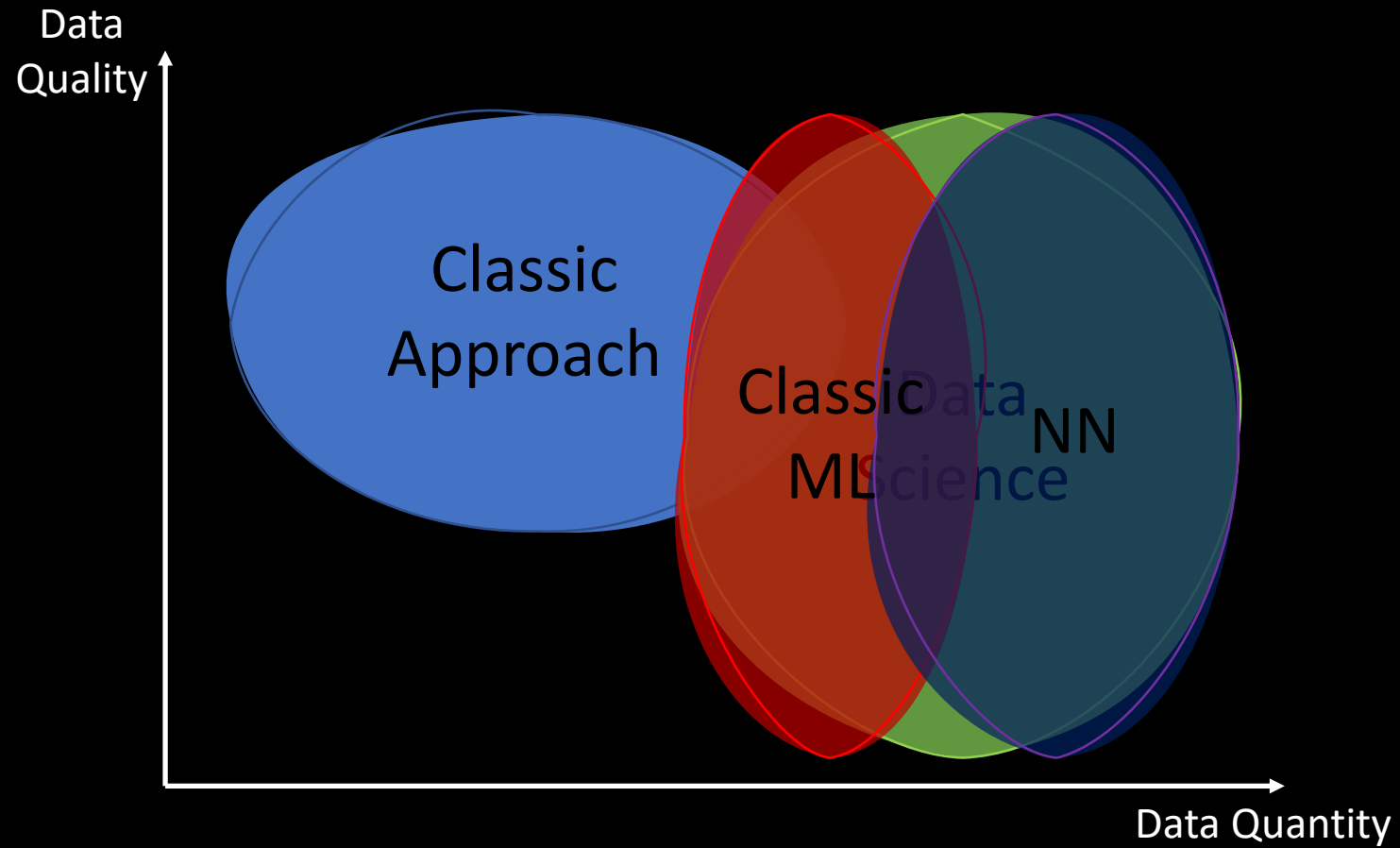
Images



When to use NN?



When to use NN?



How to use NN with Python?



How to use NN with Python?



Keras



TensorFlow

PYTORCH