دوره‌ی آموزشی «علم داده»
Data Science Course

جلسه سی و دوم (بخش اول)

نکاتی در خصوص دیتاست MNIST

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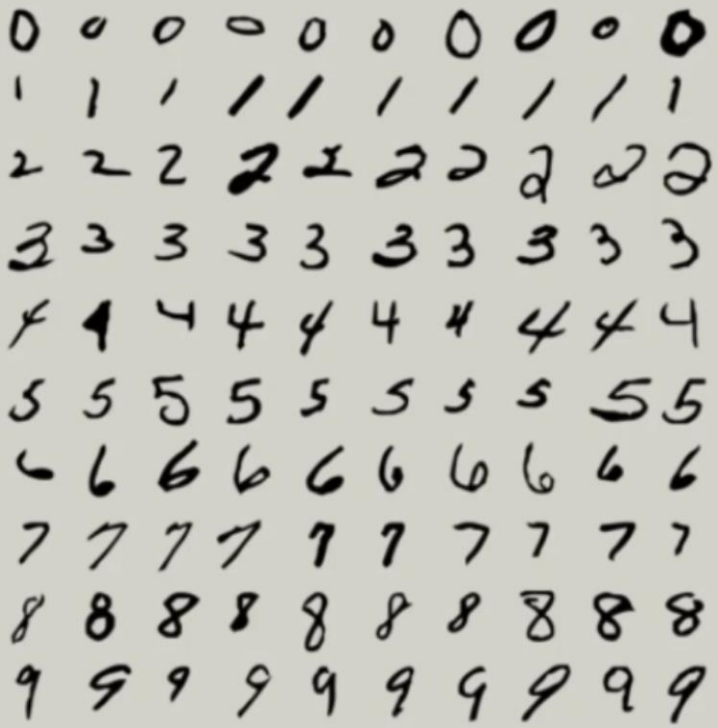
عضو هیئت علمی دانشگاه گنبدکاووس


HELLO
WORLD!

MNIST

~70,000 handwritten digits

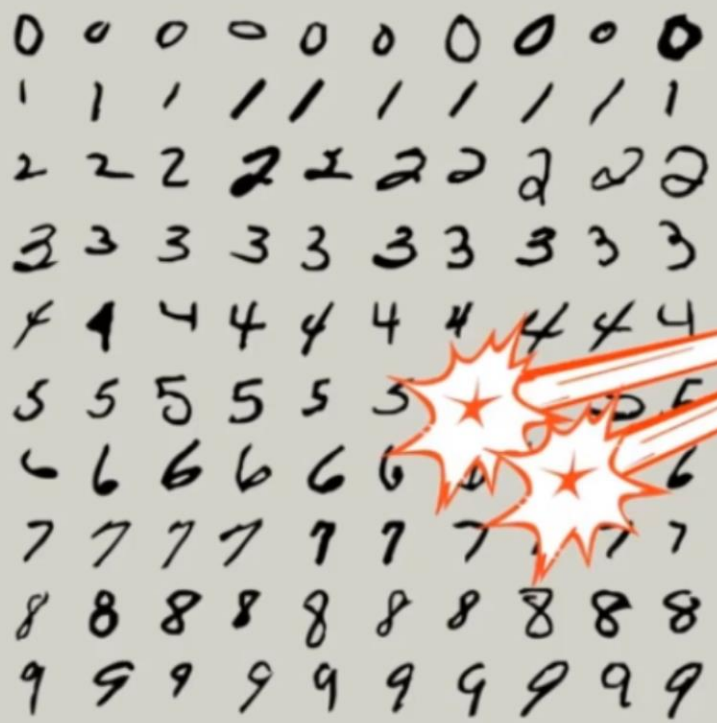


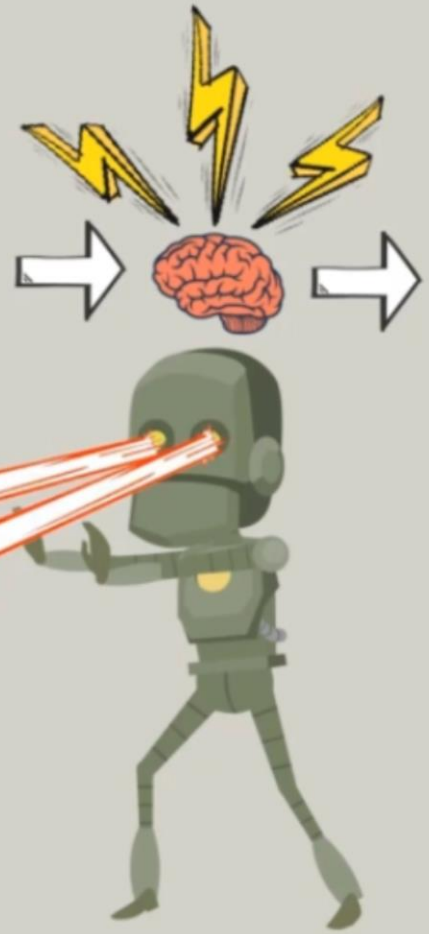
10 classes

0
1
2
3
4
5
6
7
8
9

MNIST

~70,000 handwritten digits





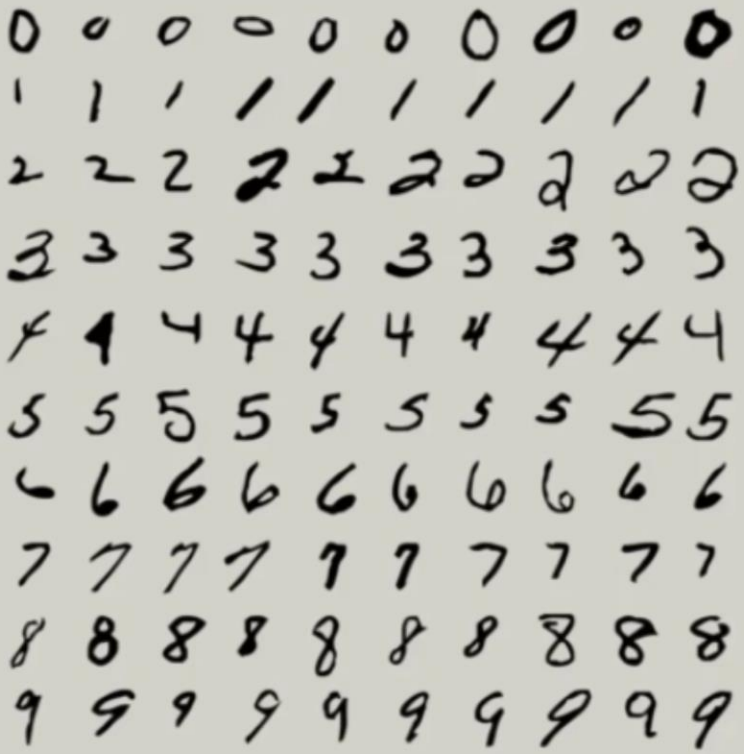
10 classes

0 0 0 0 0 0 0 0 0 0
1 1 1 1 1 1 1 1 1 1
2 2 2 2 2 2 2 2 2 2
3 3 3 3 3 3 3 3 3 3
4 4 4 4 4 4 4 4 4 4
5 5 5 5 5 5 5 5 5 5
6 6 6 6 6 6 6 6 6 6
7 7 7 7 7 7 7 7 7 7
8 8 8 8 8 8 8 8 8 8
9 9 9 9 9 9 9 9 9 9

MNIST

/"Hello world" of ML/

~70,000 handwritten digits



- Very visual problem
- Extremely common
- Easy to build up to CNN
- Very big and preprocessed

Credits

Yan LeCun

Corinna Cortes

Christopher Burges

More about MNIST

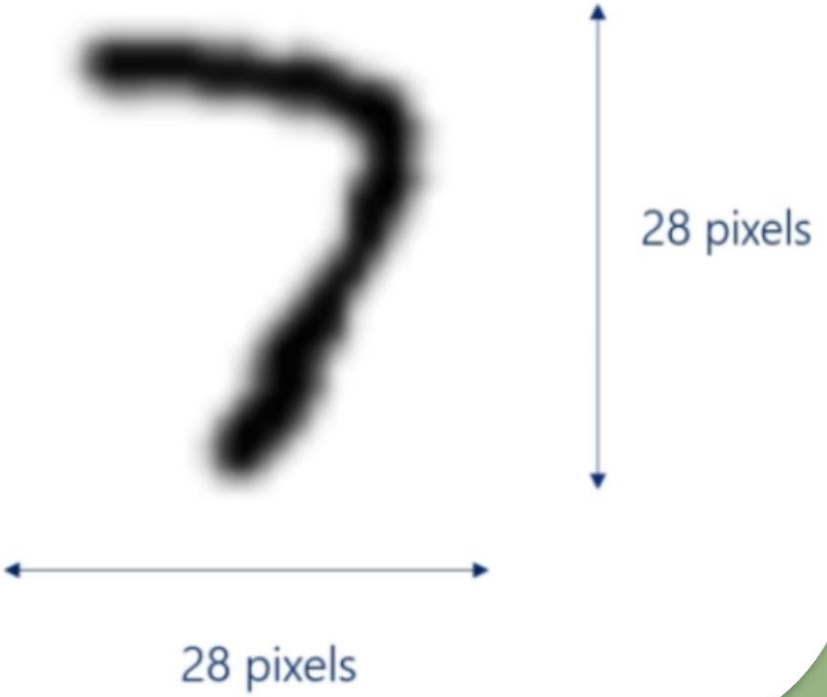
yann.lecun.com

More about Yann LeCun

- Founding father of CNNs
- Head of AI research at facebook.

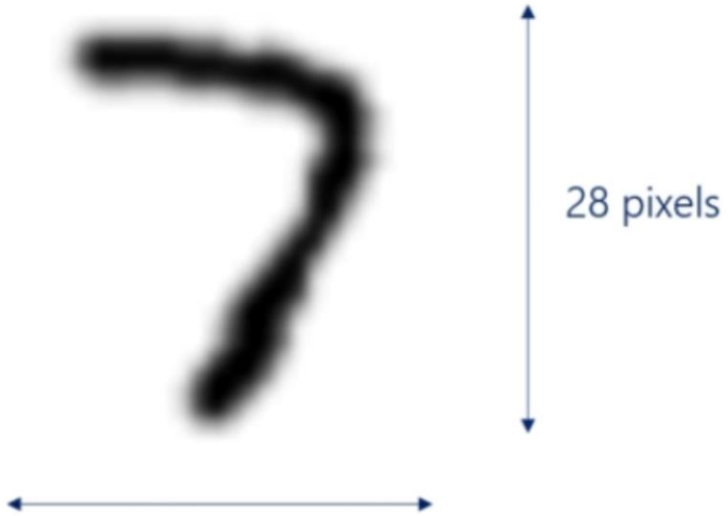
MNIST

Each photo looks like this



MNIST

Each photo looks like this

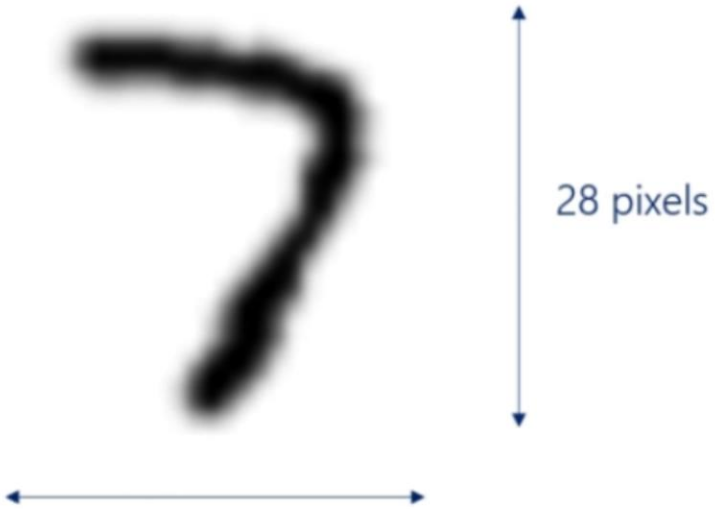


On a greyscale

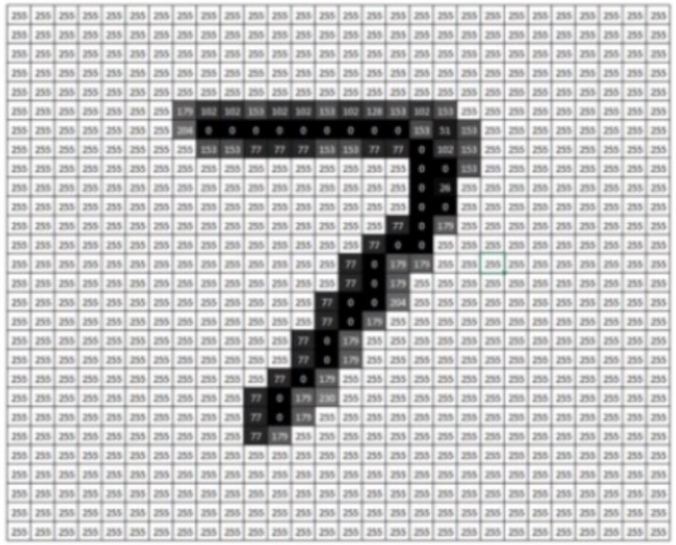
We can think about the problem as a 28x28 matrix, where input values are from 0 to 255

MNIST

Each photo looks like this



A handwritten 7 in a matrix

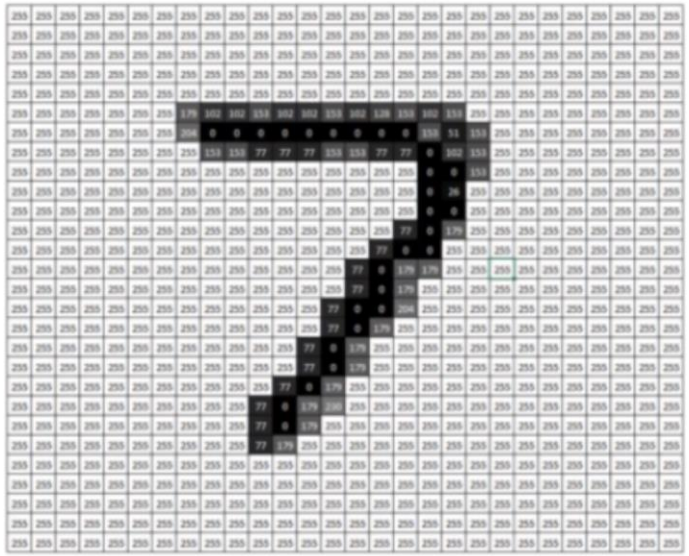


28x28

We can think about the problem as a 28x28 matrix, where input values are from 0 to 255

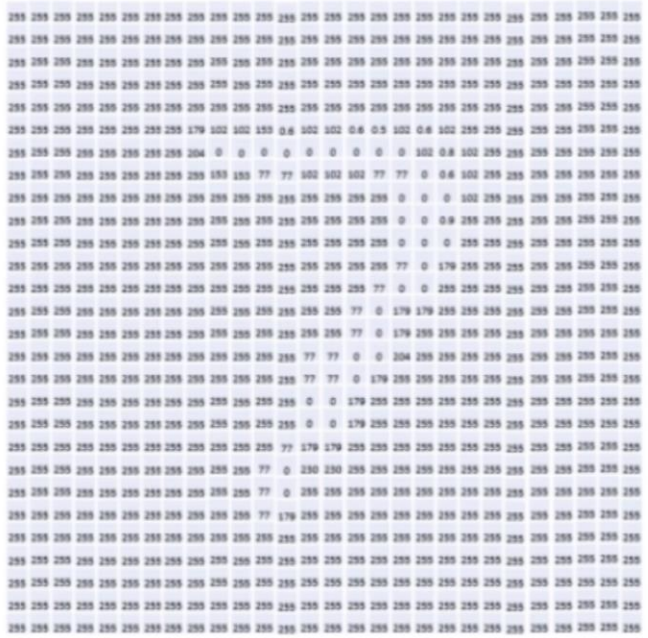
MNIST

A handwritten 7 in a matrix

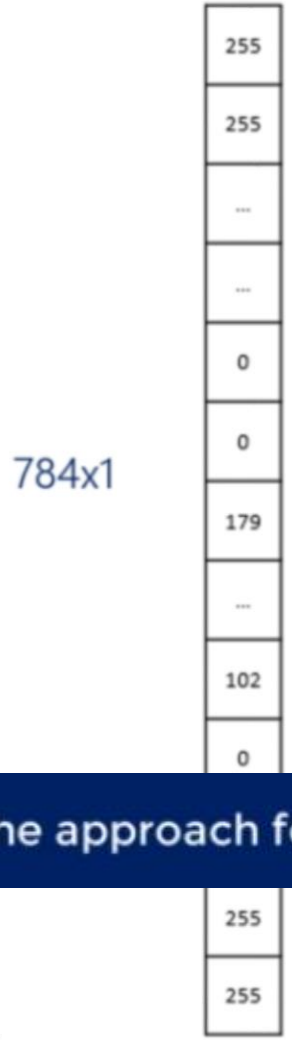


28x28=784

What the computer sees



The approach in deep neural networks



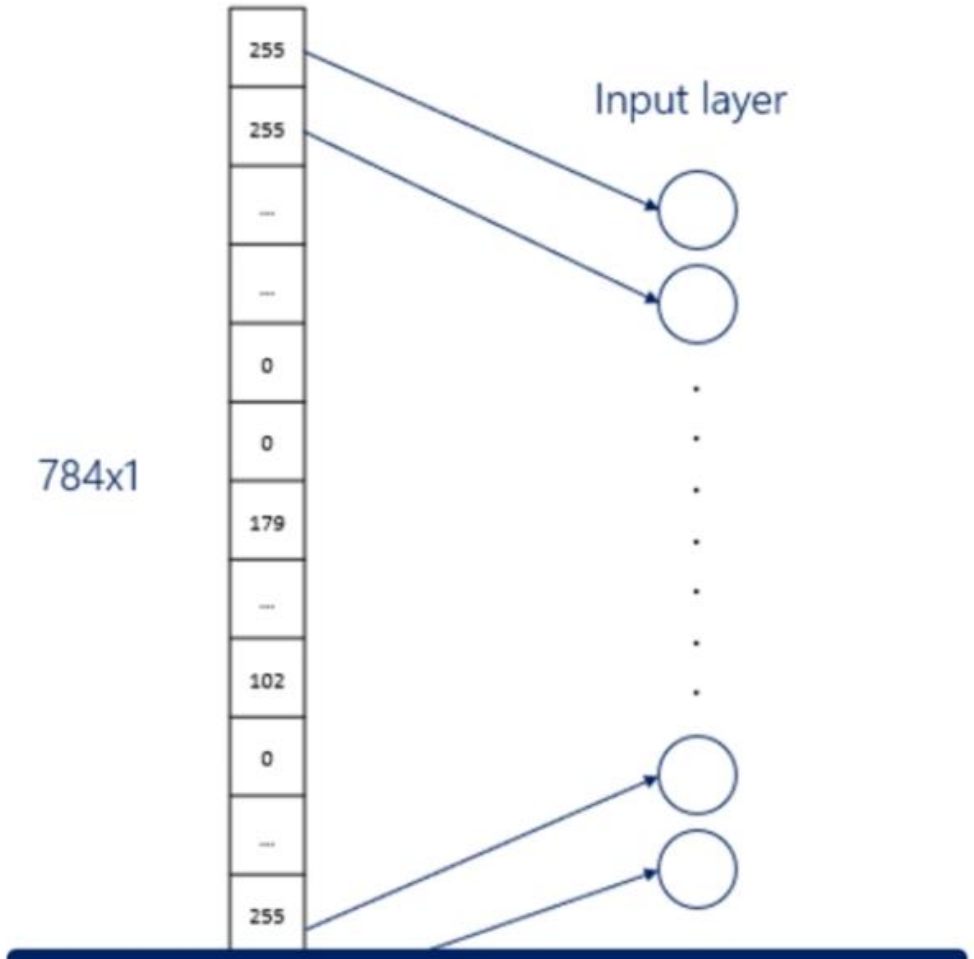
Each photo consists of 784 pixels.

Each pixel is an input for our neural network.

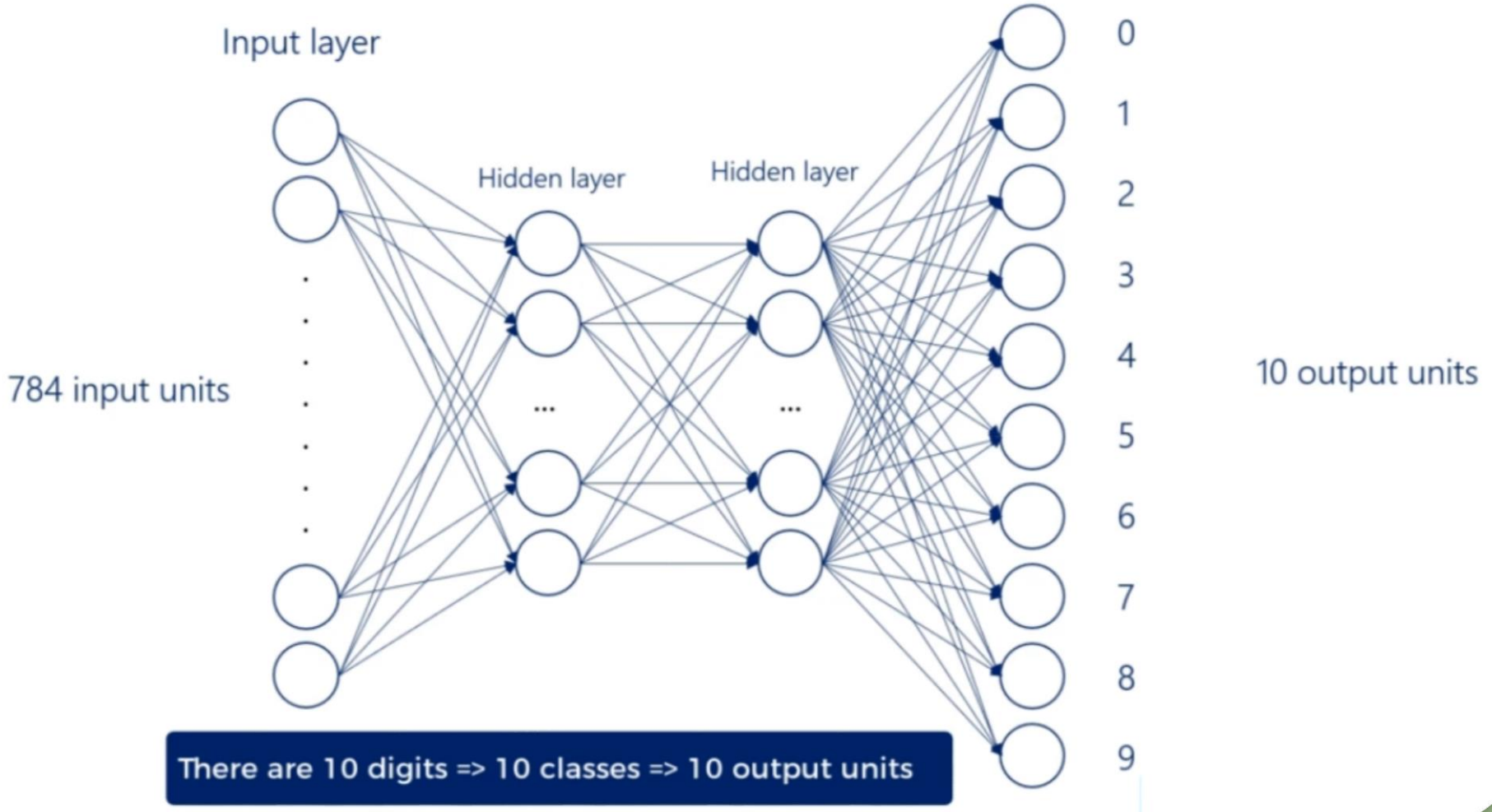
Each pixel corresponds to the intensity of the color (255 is white, 0 is black)

The approach for deep neural networks is to "flatten" each image into a vector 784 x 1

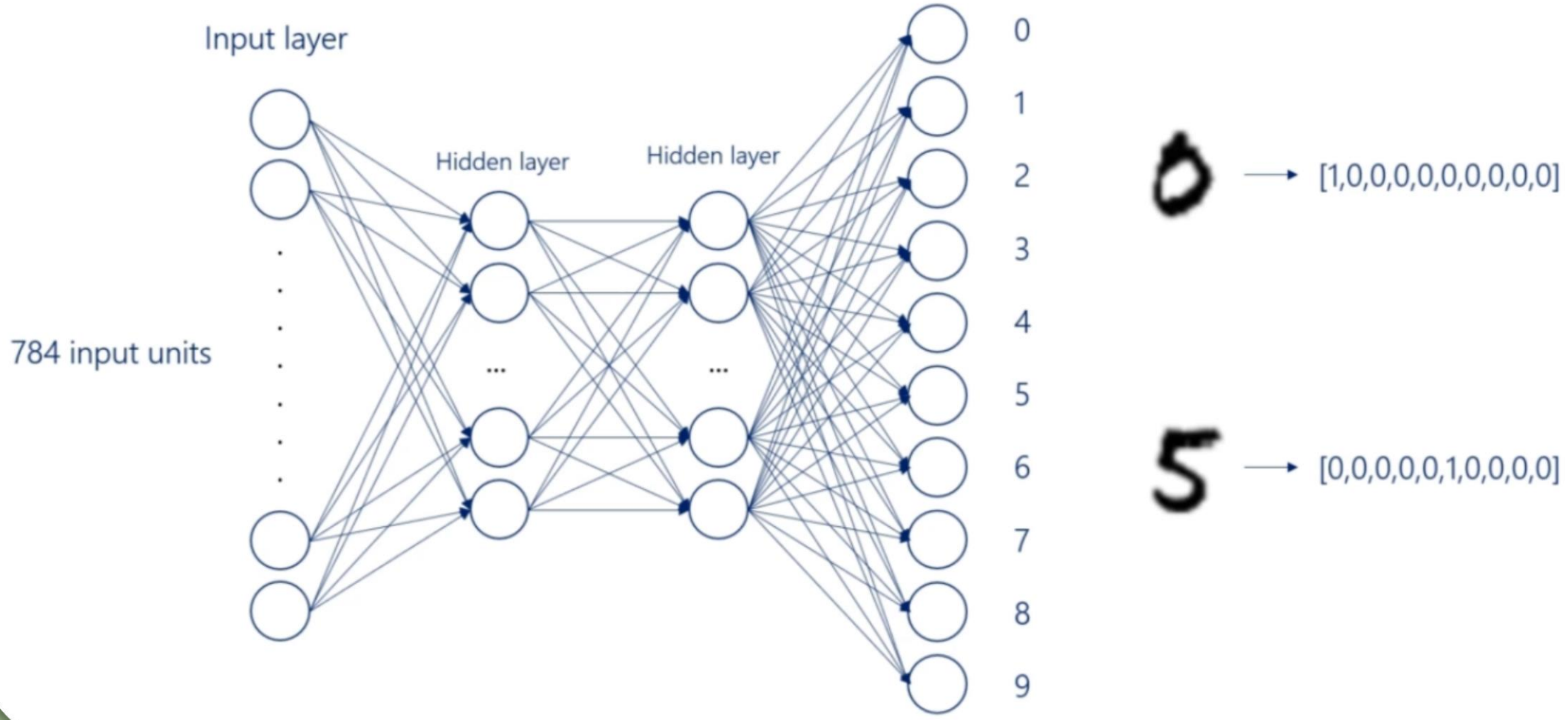
The MNIST deep net



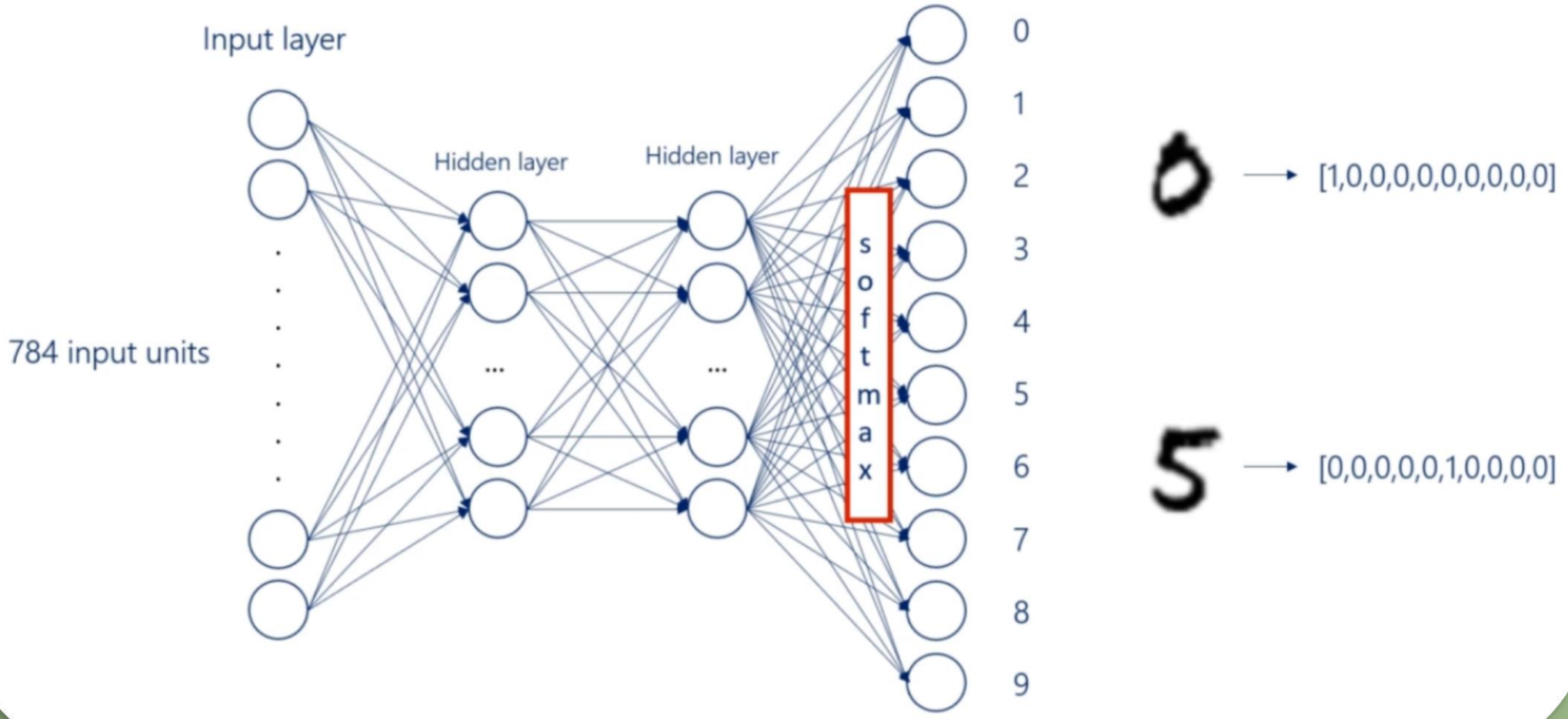
The MNIST deep net



The MNIST deep net



The MNIST deep net



The MNIST action plan

1. Prepare our data and preprocess it. Create training, validation and test datasets
2. Outline the model and choose the activation functions
3. Set the appropriate advanced optimizers and the loss function
4. Make it learn
5. Test the accuracy of the model

در ویدیوی بعدی میریم سراغ تنسورفلو
و کدزنی برای استخراج اعداد از این دیتاست

Stay Tuned and have FUN