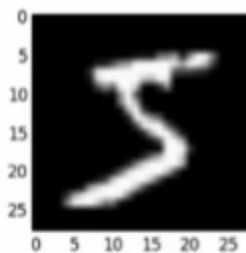


■ How many input Neurons does a Neural Network need?

➤ Kunai pani neural network maa kati input layer,hidden layer ra neurons hunxa vanni kura tesko input size le determine garxa.

➤ For eg :-

Number of neurons in input layer are determined based on input size



→ $28 \times 28 = 784$ input neurons

# Number	Digit	Stage	Type
1	Kuranon	Baby	Free
2	Pabunon	Baby	Free
3	Punimon	Baby	Free
4	Botanon	Baby	Free
5	Poyomon	Baby	Free
6	Koromon	In-Training	Free
7	Tanemon	In-Training	Free
8	Tsunonon	In-Training	Free
9	Tsunemon	In-Training	Free

→ 4 input neurons

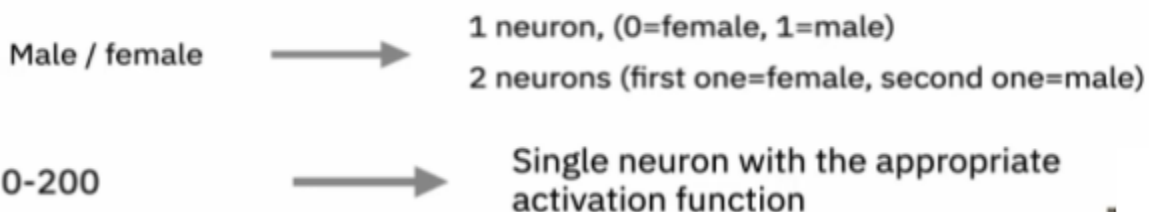
➤ Yedi hami sanga 28×28 pixel ko image data xa vane , hamle $28 \times 28 = 784$ input neuron dina parxa.

➤ Yedi hamro data table form maa xa with four features as that of in above image , then 4 input neuron hunxa.

■ How many output Neurons does a Neural Network need?

➤ No. of output layer pani data le nai dinxa, for eg :-

Number of neurons in output layer are determined based on the output type



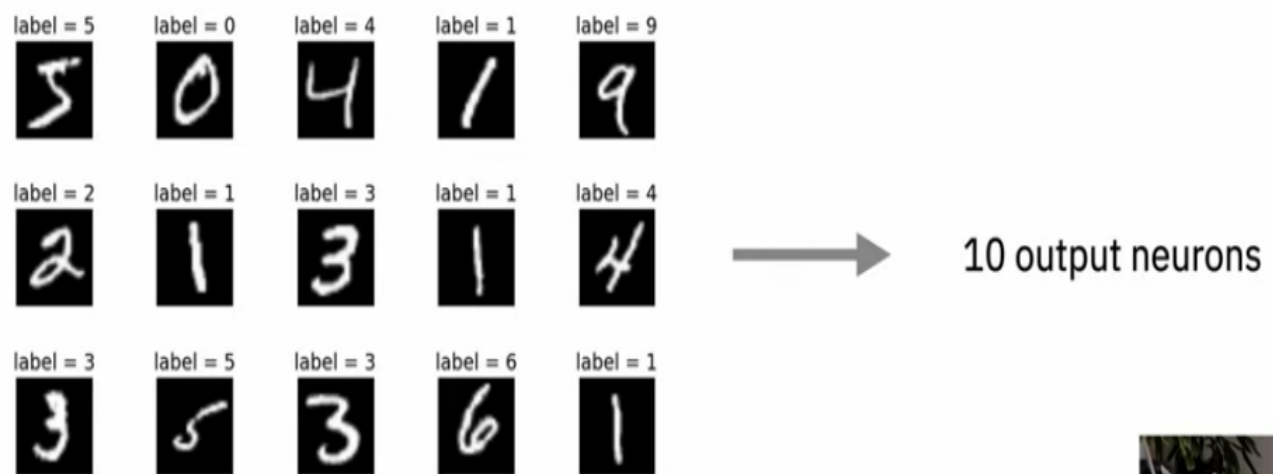
➤ Yedi hamle male / female ho vanni predict garna xa vane hame euta output neuron pani manna sakxau (0=female, 1=male) , 2 ota output neuron pani manna sakinx (1= female , 2=male)

(One Output Neuron: With one output neuron, we can use a sigmoid activation function. The network will output a single value between 0 and 1, representing the probability of the input belonging to the "male" class. This is a common setup for binary classification tasks, and we would use a threshold (e.g., 0.5) to decide whether the predicted probability corresponds to "male" or "female".

Two Output Neurons: With two output neurons, we can use a softmax activation function. Each neuron represents the probability of the input belonging to one of the classes ("male" or "female"). The output values would be probabilities that sum up to 1. We would assign the class label corresponding to the neuron with the highest probability as the predicted class.)

➤ For regression with an output range of 0 to 200, a single output neuron using a linear activation function is sufficient, predicting continuous values directly. We use a

regression loss function like MSE to train the network for accurate predictions within the specified range.



➤ yedi hamle 0-9 samma ko label maa predictions garna parxa vane ,we need 10 output neurons.

■ How many hidden layers does a Neural Network need?

➤ It is better to have a deeper network rather than a wider network.

(➤ dherai neurons vako network bhandha dherai layer bhako network badhi prefer garinx)

➤ Layers learn features at different complexity.

(In a neural network, think of the layers like detectives. The first layer looks for basic clues, like edges and shapes. As you go deeper, they find more complex details, like patterns and objects. Each layer focuses on different parts of the problem, working together to understand it fully.)

➤ 1,2 ota hidden layers haru enough nai hunxan for many problems

➤ 2 ota hidden layer bata suruwat garda hunxa ,ani paxi overfitting, underfitting jasto problem aauda tai anusar milaudai jani