

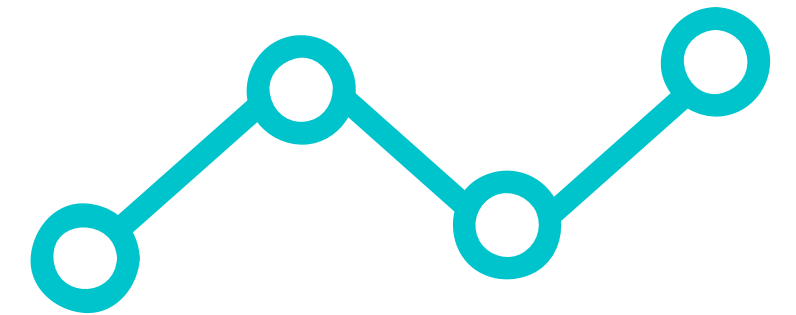
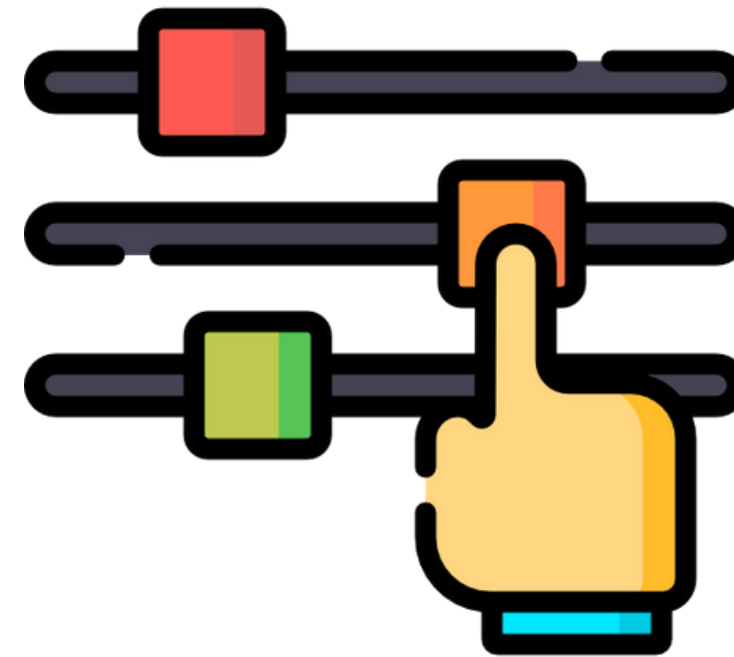
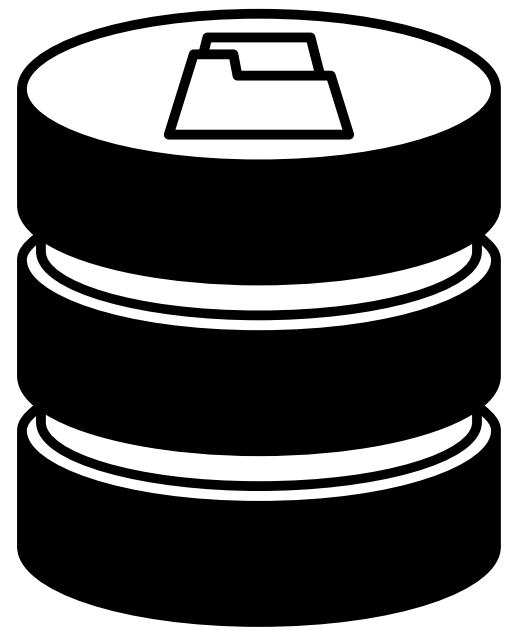
# Individual Assignment

CE889 Neural Network and Deeplearning

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# AGENDA



## Data detailing 01

- Partition of data
- Processing of data

## Design choices 02

- Architecture/Topology

## Parameters detailing 03

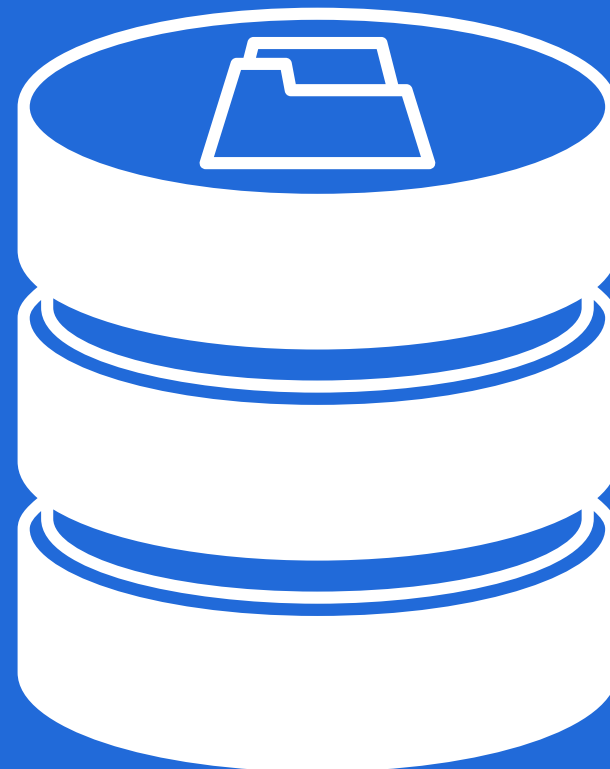
- What parameter
- How to pick them
- What effect did they have

## RMSE 04

- RMSE values
- early stopping criteria and why

C E 8 8 9

# DATA PRE-PROCESSING



## Partition of data

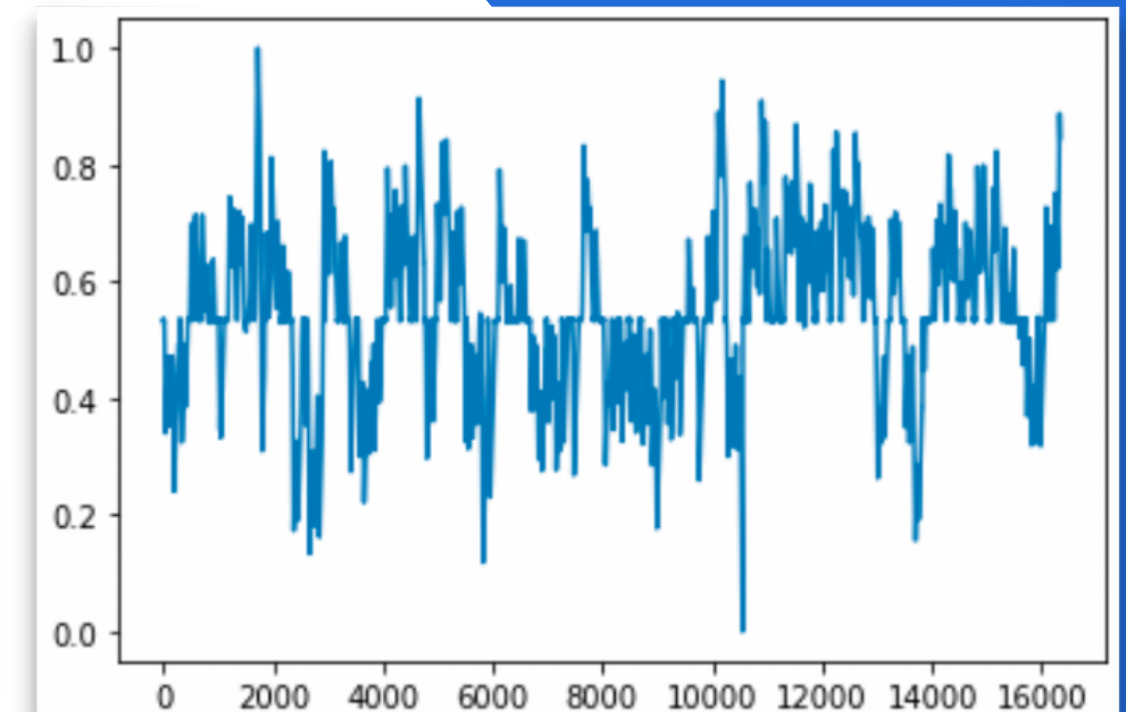
- 70% for Training.
- 30% for Testing

	A	B	C	D
1	-404.27155	437.399878	-1.099391	0.01906881
2	-404.29062	438.499269	-1.1982954	-0.0418369
3	-404.24878	439.697564	-1.296349	-0.0296715
4	-404.21911	440.993913	-1.3933105	-0.0244011
5	-404.19471	442.387224	-1.48894	-0.0259835
6	-404.16872	443.876164	-1.5829992	-0.0343679
7	-404.13436	445.459163	-1.6752515	-0.0494953
8	-404.08486	447.134415	-1.7654628	-0.0712987
9	-404.01356	448.899878	-1.8534014	-0.0997028
10	-403.91386	450.753279	-1.9388381	-0.1346241
11	-403.77924	452.692117	-2.0215472	-0.1759714
12	-403.60326	454.713664	-2.101306	-0.2236456
13	-403.37962	456.81497	-2.1778955	-0.2775399
14	-403.10208	458.992866	-2.2511006	-0.3375399
15	-402.76454	461.243966	-2.3207102	-0.4035238
16	-402.36101	463.564677	-2.3865178	-0.4753624
17	-401.88565	465.951194	-2.4483212	-0.5529194
18	-401.33273	468.399516	-2.5059233	-0.6360517
19	-400.69668	470.905439	-2.5591322	-0.7246092
20	-399.97207	473.464571	-2.6077612	-0.8184354
21	-399.15364	476.072332	-2.6516291	-0.917367
22	-398.23627	478.723961	-2.6905608	-1.021235
23	-397.21503	481.414522	-2.7243869	-1.129864
24	-396.08517	484.138909	-2.7529444	-1.2430729

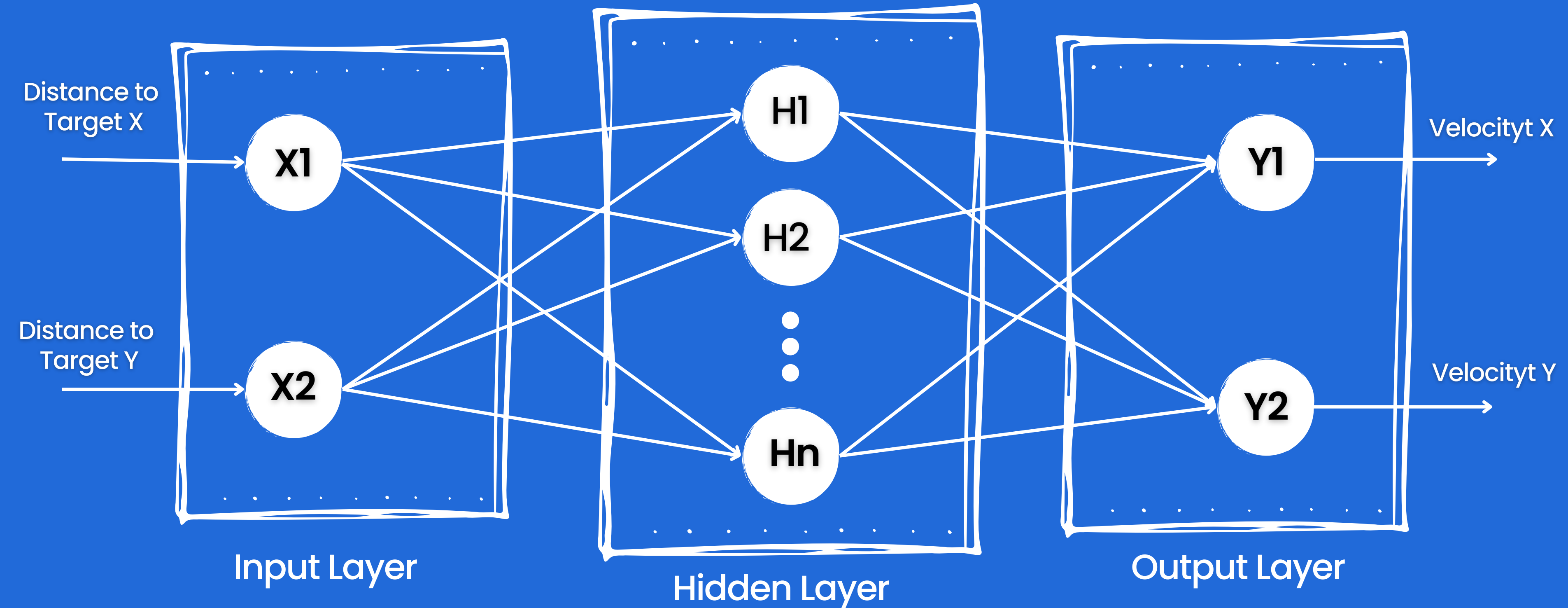
## Processing of data

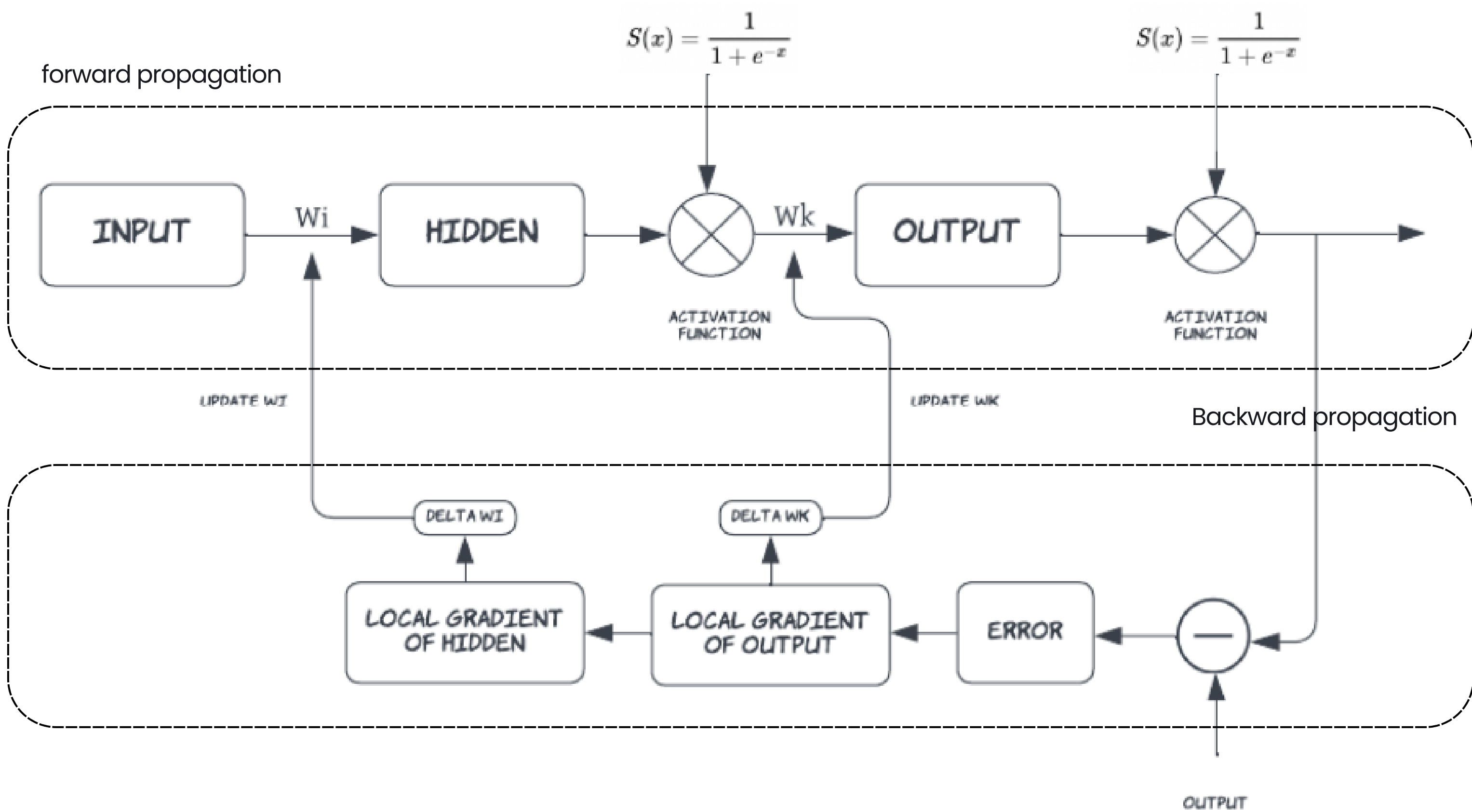
- Data normalization
- Scale raw data to 0-1

$$z_i = \frac{x_i - \min(x)}{\max(x) - \min(x)}$$



# Model Architecture





# Parameters detailing

01

## Number of network

Using the number of node that give a minimum of Error

02

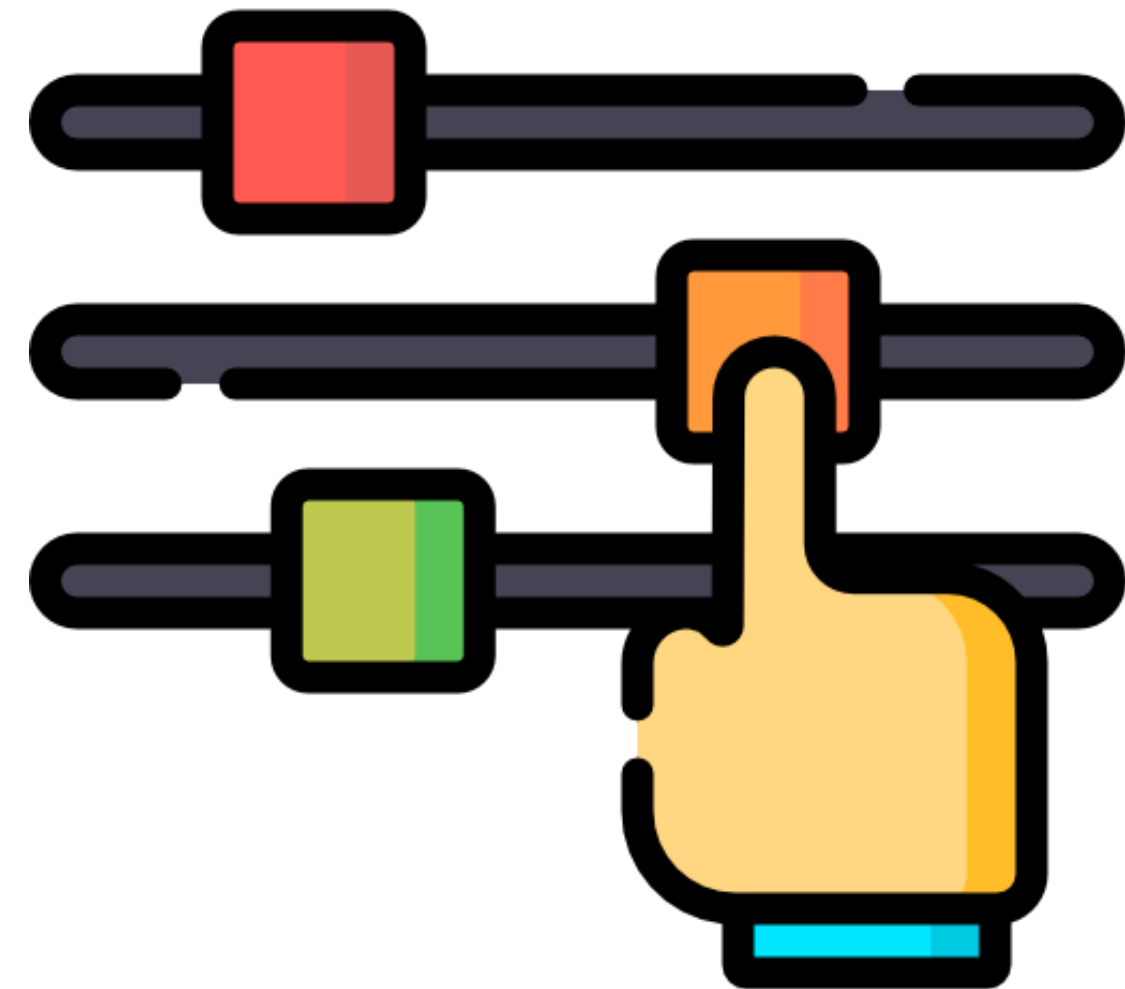
## Learning Rate

Using the value of learning rate that give a minimum of Error

03

## Momentum

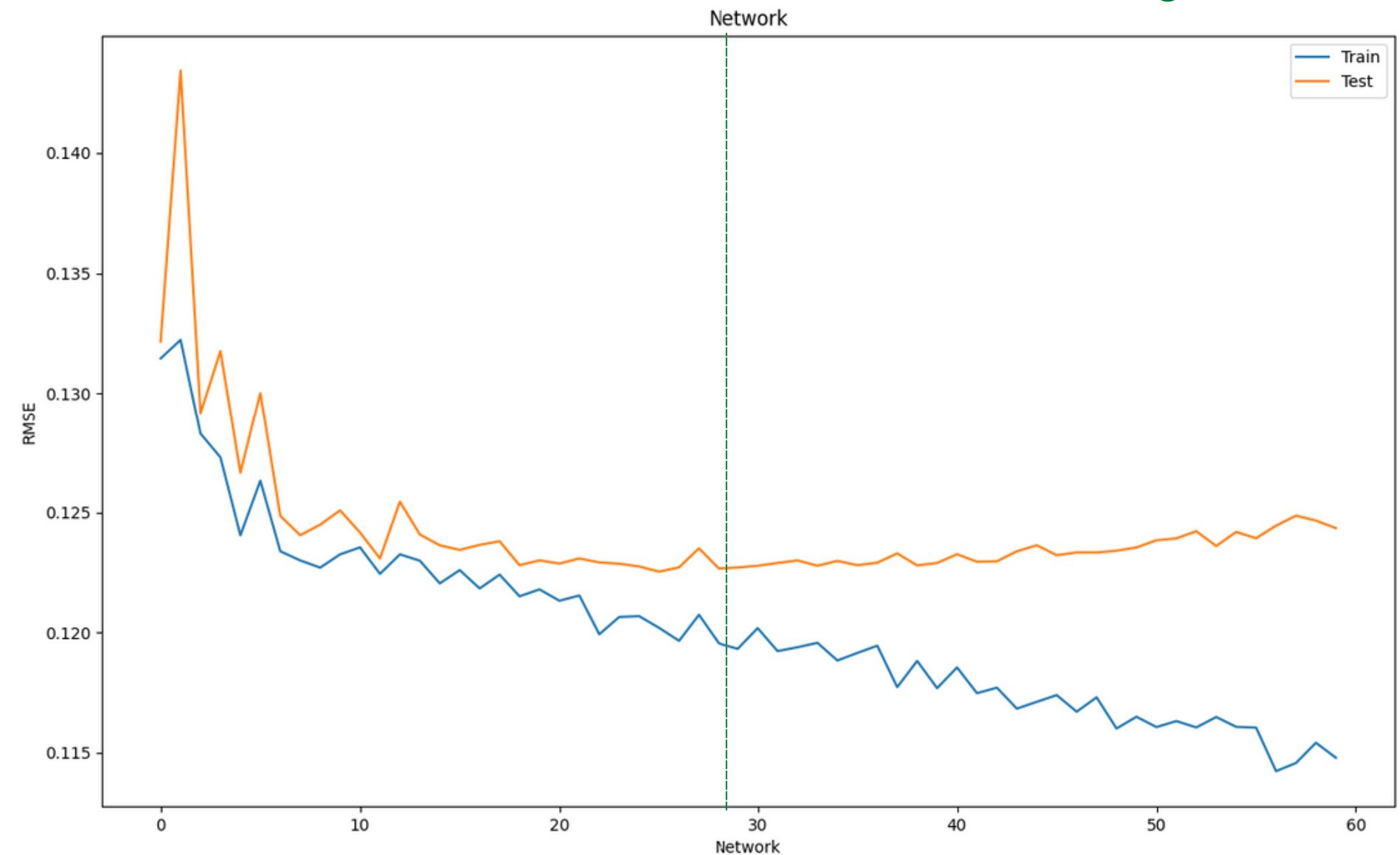
Using the value of momentum that give a minimum of Error



# Number of Network

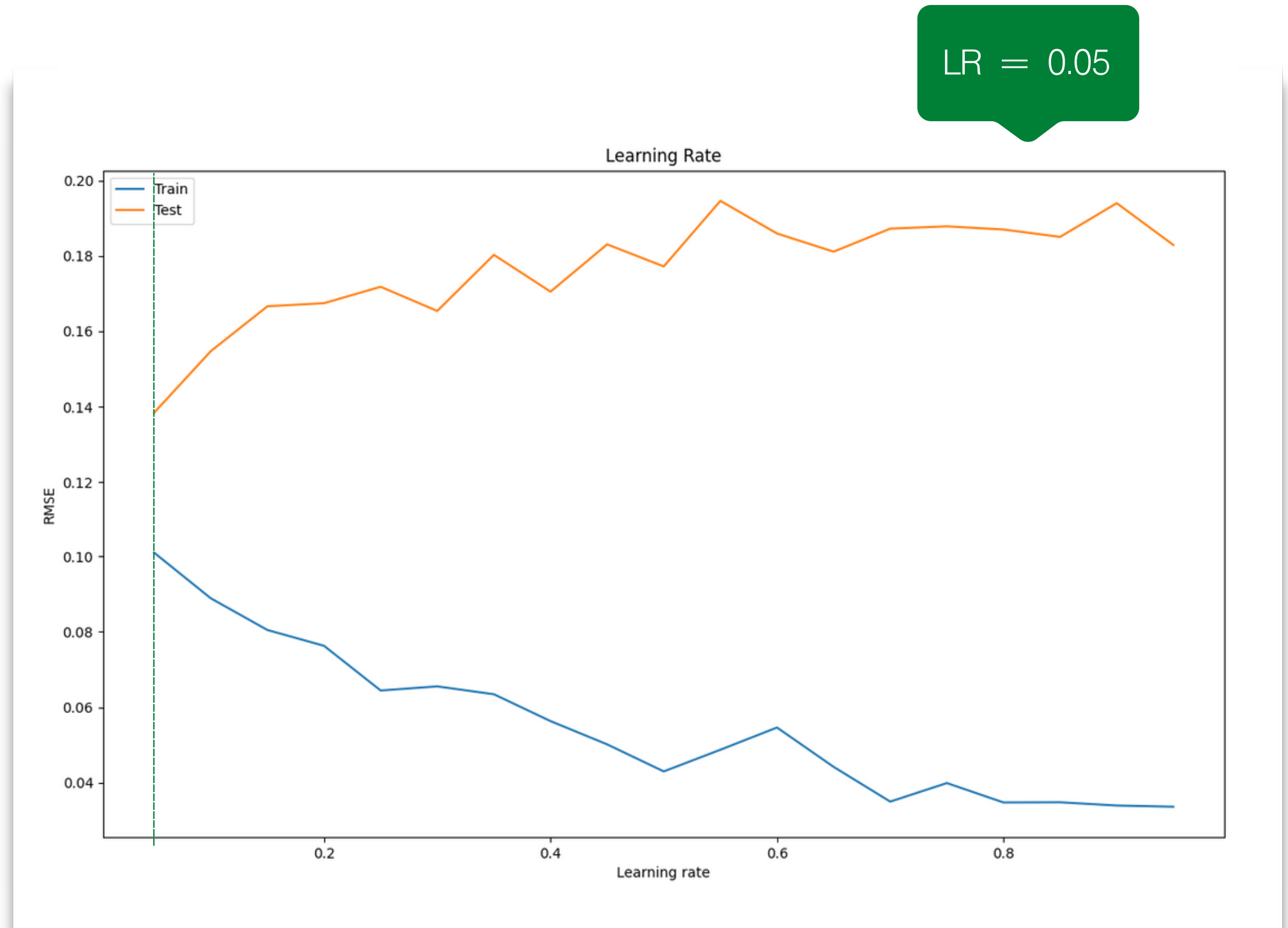
Node = 29

- Run the neural network model by training data and testing data with the random value of weight in the range  $-1, 1$  by size from 2 – 100 nodes
- Run the model by given the values of Learning Rate as 0.01 and the values of Momentum as 0
- Pick the fit number of network where the testing rms value is lowest



# Learning Rate

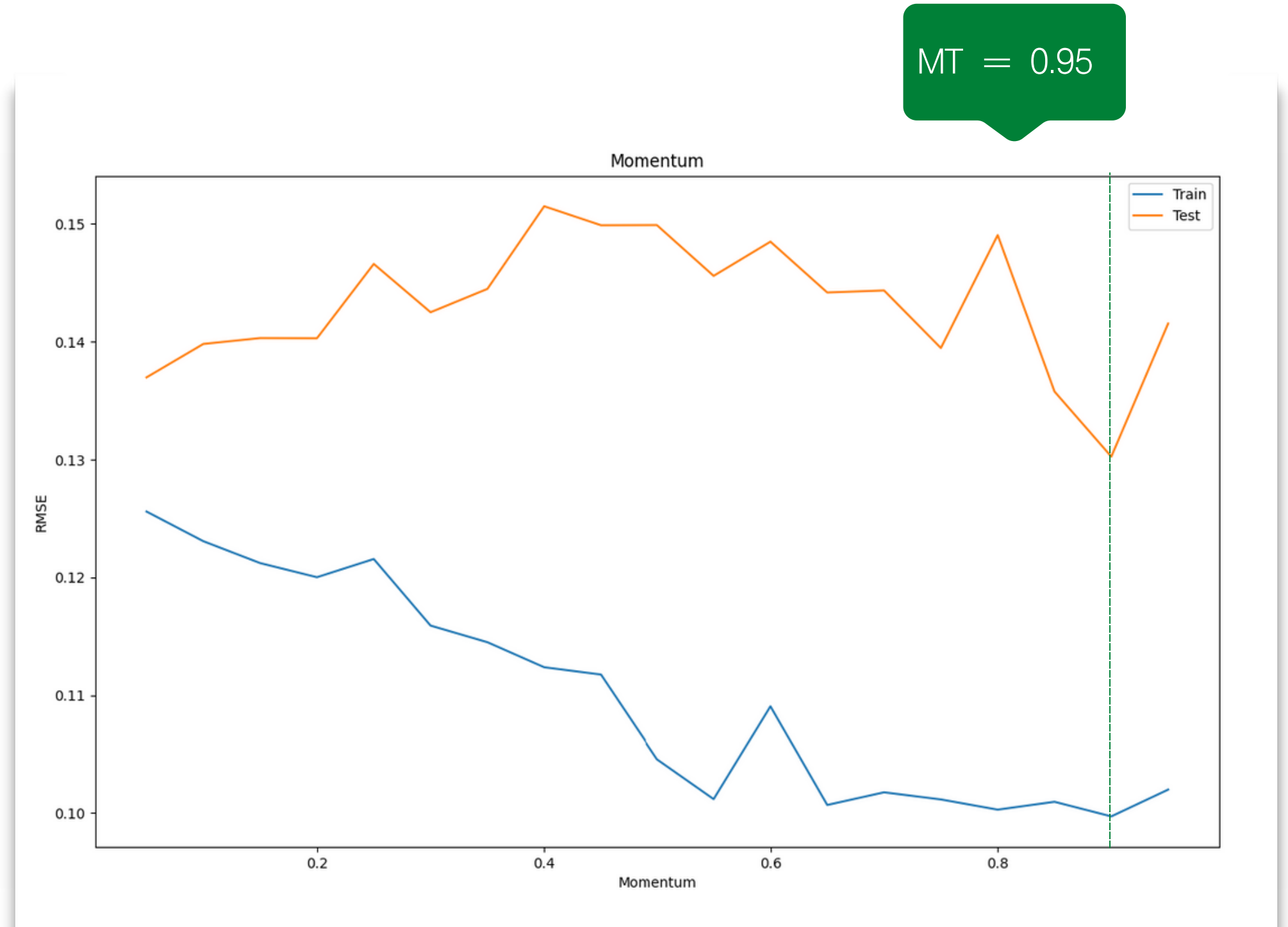
- Use the best Network number from last function set to run training and testing data with the value of momentum as 0
- given the value of learning rate as [0.05, 0.15, 0.2, ..., 0.95]
- Pick the fit learning rate value where the testing rms value is lowest





# Momentum

- Use the weight set and Learning Rate from the last that given the minimum error
- Run the model in each momentum values by given as  $[0.05, 0.15, 0.2, \dots, 0.95]$
- Pick the fit Momentum value where the testing rms value is lowest



# RMSE – from testing and training Model

- Run model 200 epoch
- Pick the best weight where the lowest testing rmse

