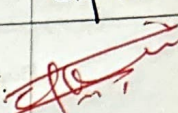
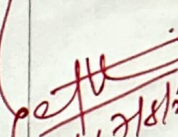
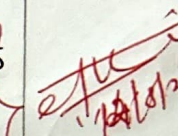
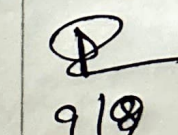
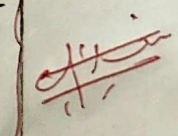
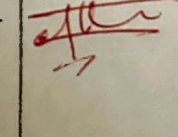
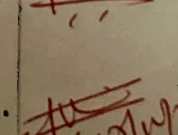
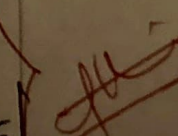


Serial. No.	Topic.	Date.	Signature
1/	Exploring the Deep Learning Platforms & Frameworks	31/07/2025.	
2/	Implement a Classifier using an open-source dataset	7/8/2025	
3/	Study of Classifiers with respect to Statistical Parameter	7/8/2025	
4/	Build a simple feed forward network to recognize handwritten character	14/8/2025	
5/	Study of Activation Functions and its role	9/9/2025	
6/	Implement gradient descent and backpropagation in deep neural network.	13/9/2025	
7/	Build a CNN model to classify Cat & dog image	13/9/2025	
8/	Experiment using LSTM	13/9/2025	
9/	Build a Recurrent Neural Network	13/9/2025.	
10/	Perform compression on MNIST	02/11/25	
11/	Experiment using VAE		
12/	Implement a DCGAN		
13/	Understand pre-trained model		
14/	Transfer Learning		
15/	YOLO Model		

Completed

Exp-9 Build a Recurrent Neural Network

13/09/25

Aim:

To implement a Recurrent Neural Network for predicting the next value in a sine wave sequence.

Objective:-

- Understand how RNNs learn sequential dependencies.
- Apply RNN for time series forecasting.
- Evaluate prediction accuracy using test data.

Pseudocode:-

- 1) Generate sine wave dataset.
- 2) Convert to sequences of length 50 (x) with next value as target (y).
- 3) Split into training and testing sets.
- 4) Reshape to [samples, timesteps, features].
- 5) Build RNN:
 - SimpleRNN(50, activation = 'tanh')
 - Dense(1)
- 6) Compile model.
- 7) Train for 10 epochs.
- 8) Evaluate MSE.

Results:-

<u>Epoch</u>	<u>Loss</u>	<u>Val. Loss</u>
1/10	0.0420	0.0048
2/10	0.0016	5.2527e-04
3/10	1.8424e-04	5.6854e-05
4/10	4.4656e-05	2.7030e-05
5/10	2.2604e-05	2.3010e-05
6/10	1.6518e-05	1.2060e-05
7/10	1.1889e-05	1.0162e-05
8/10	7.7479e-06	7.3630e-06
9/10	6.8603e-06	6.4271e-06
10/10	6.3672e-06	4.9440e-06.

Test MSE: 0.000005

Observation:

- Training and validation loss decreased steadily.
- Model achieved near-zero MSE ($\sim 1.39e-06$)
- Predictions closely matched the actual sine wave values.

Result:

The RNN was successfully implemented.

~~17/09/2020~~

Results (contd.)

	<u>Predicted</u>	<u>Actual</u>
1)	-0.5611	-0.5649
2)	-0.4764	-0.4796
3)	-0.3879	-0.3895
4)	-0.2955	-0.2955
5)	-0.1996	-0.1986

Diagram

