



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai

Accredited by NAAC-UGC with 'A++' Grade (Cycle III) &

Accredited by NBA (B.E - CSE, EEE, ECE, Mech&B.Tech.IT)

COIMBATORE-641 035, TAMIL NADU



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B.E/B.Tech- Internal Assessment – II
Academic Year 2024-2025 (Even Semester)
Sixth Semester

19CST302-NEURAL NETWORKS & DEEP LEARNING

B

Answer Key

Answer All Questions

PART-A (5 x 2 = 10 Marks)

CO Blooms

How to avoid Bad Local Minima?

CO2 Ana

- consider using techniques like stochastic gradient descent (SGD), advanced optimizers with momentum, regularization, and ensemble methods

Define Parametrized ReLU .

CO2 Rem

- PRelu) is a type of rectifier in neural networks that automatically trains the parameters to enhance network accuracy without the risk of overfitting

State the importance of Deep Recurrent Networks.

CO3 Ana

- (RNNs) are crucial for processing sequential data by capturing temporal dependencies and patterns, making them valuable for tasks like language modeling

List out the various applications of Pooling Layers.

CO3 Rem

- image recognition, object detection, and face identification. Pooling helps reduce the size of the feature maps created by convolutional layers, making CNNs faster and more efficient

- Identify the use of Convolution Layer in Neural Networks

CO3 Rem

CNNs are used for feature extraction from input data, like images, by applying filters (kernels) to identify patterns and create feature maps.

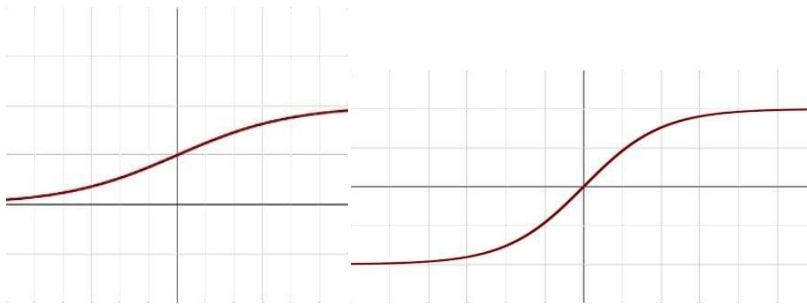
PART – B (2*13=26 Marks) & (1*14=14 Marks)

CO Blooms

- (a) Why ReLU activation function gained importance in neural networks and how it can be implemented? (8 marks)

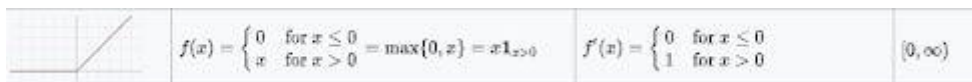
The rectified linear unit (ReLU) or rectifier activation function introduces the property of nonlinearity to a deep learning model and solves the vanishing gradients issue.

13 CO2 Und



(5 Marks)

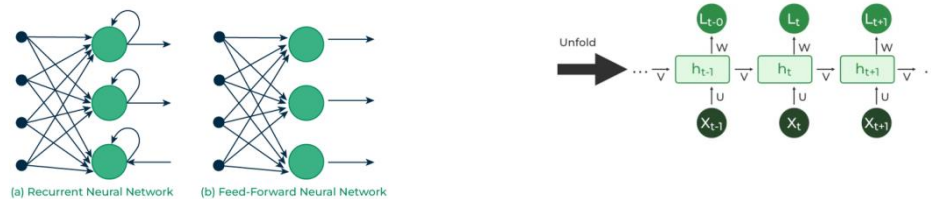
The main reason ReLU wasn't used until more recently is because it was not differentiable at the point zero. Researchers tended to use differentiable activation functions like sigmoid and tanh. However, it's now determined that ReLU is the best activation function for deep learning.



(OR)

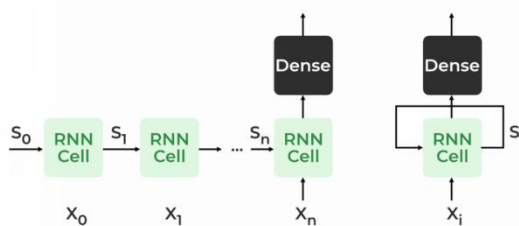
- (b) Discuss the operation of Recurrent Neural Networks(RNNs) in detail with its architecture and necessary diagram. (8 marks)

Recurrent Neural Networks (RNNs) work a bit different from regular neural networks. In neural network the information flows in one direction from input to output. However in RNN information is fed back into the system after each step. (5 marks)



13 CO2 Und

RECURRENT NEURAL NETWORKS



7. (a) Illustrate the functionality of Filter, Stride, Padding, Pooling and Flatten in CNN. (8 marks) 13 CO3 Ana

Pooling layer is used in CNNs to reduce the spatial dimensions (width and height) of the input feature maps while retaining the most important information. It involves sliding a two-dimensional filter over each channel of a feature map and summarizing the features within the region covered by the filter.

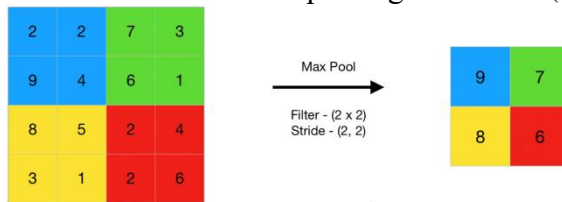
For a feature map with dimensions $nh \times nw \times nc$, the dimensions of the output after a pooling layer are:

$$(nh-f+1s) \times (nw-f+1s) \times nc$$

where:

- nh → height of the feature map
- nw → width of the feature map

- ncnc → number of channels in the feature map
- ff → size of the pooling filter (5 marks)



(OR)

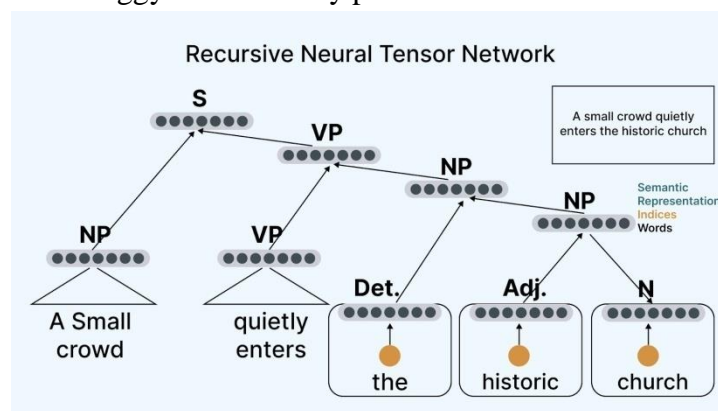
- (b) Examine how the Recursive Neural Network is used for sentiment analysis in natural language sentences. Discuss about using a real-world example.

13 CO3 Ana

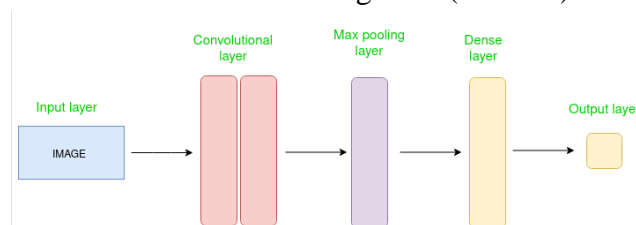
(8 marks)

Recurrent Neural Networks (RNNs) excel in sequence tasks such as sentiment analysis due to their ability to capture context from sequential data. In this article we will be apply RNNs to analyze the sentiment of customer reviews from Swiggy food delivery platform.

(5 marks)



8. (a) What is Convolutional Neural Network and Explain functionality of the Layers in Convolution Neural Network with neat diagram . (6 marks)



(8 marks)

- Input Layers: It's the layer in which we give input to our model. In CNN, Generally, the input will be an image or a sequence of images.
- Convolutional Layers: This is the layer, which is used to extract the feature from the input dataset. It applies a set of learnable filters known as the kernels to the input images. The filters/kernels are smaller matrices usually 2x2, 3x3, or 5x5 shape. Activation Layer: By adding an activation function to the output of the preceding layer, activation layers add nonlinearity to the network.

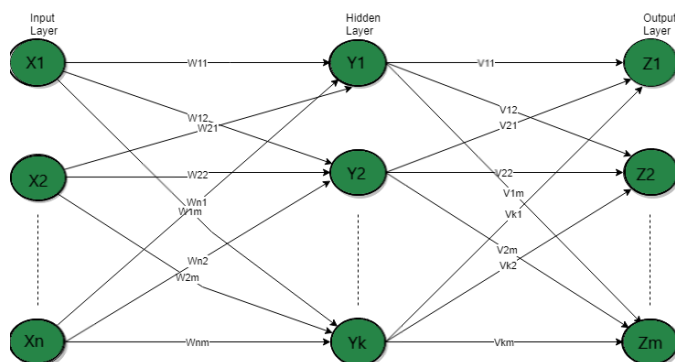
14 CO2 Ana

(OR)

- (b) Draw and Explain Recurrent Neural Network and Write its Characteristics. Differentiate Feed forward Network and Recurrent Neural Network.

14 CO3 Ana

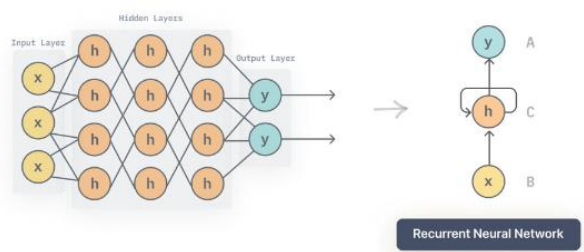
(8 marks)



(6 marks)

Recurrent Neural Networks

The Recurrent Neural Network saves the output of a layer and feeds this output back to the input to better predict the outcome of the layer. The first layer in the RNN is quite similar to the feed-forward neural network and the recurrent neural network starts once the output of the first layer is computed. After this layer, each unit will remember some information from the previous step so that it can act as a memory cell in performing computation



Bloom's Taxonomy: **REM** – Remember **UND** – Understand **APP**– Apply **ANA**–Analyse

Course faculty

Teaching Coordinator

HoD

Dean