1. Why don't we start all of the weights with zeros?

Symmetry Breaking Problem:

Weight Update Problem

Breaking the Gradient Flow

1. Why is it beneficial to start weights with a mean zero distribution?

Symmetry Breaking

Avoiding Biases:

Effective Gradient Flow

Consistent Activation Behavior

1. What is dilated convolution, and how does it work?

Dilated convolution, also known as atrous convolution, is a variant of the standard convolution operation in neural networks. It introduces a dilation rate parameter to control the spacing between kernel elements during the convolution operation.

1. What is TRANSPOSED CONVOLUTION, and how does it work?

Transposed convolution, also known as deconvolution or fractionally strided convolution, is an operation that performs an inverse operation to the standard convolution. It is commonly used in tasks like image generation, image segmentation, and upsampling in convolutional neural network

5.Explain Separable convolution

Separable convolution is a technique used in convolutional neural networks (CNNs) to reduce the computational cost of convolutional operations while maintaining effective feature extraction. It decomposes a standard convolution into two separate convolutions: a depthwise convolution and a pointwise convolutio

6.What is depthwise convolution, and how does it work?

Depthwise convolution is a type of convolutional operation used in convolutional neural networks (CNNs) that performs separate convolutions on each input channel independently. It is a key component of separable convolution, which aims to reduce the computational cost of convolutions while maintaining effective feature extraction.

7.What is Depthwise separable convolution, and how does it work?

Depthwise convolution is a type of convolutional operation used in convolutional neural networks (CNNs) that performs separate convolutions on each input channel independently. It is a key component of separable convolution, which aims to reduce the computational cost of convolutions while maintaining effective feature extraction

8.Capsule networks are what they sound like.

Capsule networks, also known as CapsNets, are a type of neural network architecture introduced by Geoff Hinton and his colleagues as an alternative to traditional convolutional neural networks (CNNs). Capsule networks aim to address some limitations of CNNs, particularly in handling spatial hierarchies and capturing complex relationships among objects in images.

9. Why is POOLING such an important operation in CNNs?

Pooling is an important operation in convolutional neural networks (CNNs) for several reasons:

Dimensionality Reduction:

Translation Invariance

Feature Selection:

Local Spatial Invariance:

10. What are receptive fields and how do they work?

The concept of receptive fields is fundamental in CNNs as it determines the level of spatial information captured by each neuron and how different layers of the network perceive the input.

Local Receptive Field

Global Receptive Field

Receptive Field Size: