# Week 6 Quiz

## Q1.

What is the primary purpose of using an activation function in a neural network neuron?

A. A) To ensure that the neuron only outputs positive values

B. B) To introduce non-linearity to the model, allowing it to learn complex patterns

C. C) To multiply the input value by a predetermined weight

D. D) To add a bias value to the input before processing

## Q2.

What is the primary goal of Convolutional Neural Networks (CNNs) in computer vision?

A. A) To increase the resolution of images

B. B) To learn spatial hierarchies of features from images

C. C) To reduce the computational complexity of neural networks

D. D) To replace traditional image processing techniques completely

## Q3.

What does a neuron in a neural network typically compute?

A. A) The product of all inputs

B. B) The maximum of the input values

C. C) A weighted sum of its input plus a bias

D. D) The average of its input values

## Q4.

In the context of CNNs, what is a kernel used for?

A. A) To randomly initialize the network's weights

B. B) To perform the convolution operation on the input data

C. C) To pool features in the feature map

D. D) To connect every neuron in one layer to every neuron in the next layer

## Q5.

Before the advent of deep learning, feature extraction in computer vision was performed using:

- A. A) Randomly generated features
- B. B) Deeply learned features
- C. C) Handcrafted features
- D. D) Automatically extracted features

## Q6.

Which layer in a CNN is primarily responsible for reducing the spatial size of the feature map?

- A. A) Convolutional layer
- B. B) ReLU layer
- C. C) Pooling layer
- D. D) Fully connected layer

## Q7.

Which of the following best describes the process of backpropagation in training neural networks?

- A. A) Adjusting the output layer weights only based on the error
- B. B) Calculating the gradient of the loss function for every weight in the network
- C. C) Propagating input data from the output layer back to the input layer
- D. D) Randomly adjusting weights until the desired output is achieved

## Q8.

In the context of CNNs, 'feature maps' are:

- A. A) Maps of the most important features selected by the network
- B. B) Outputs of the convolution operation
- C. C) Inputs to the network before any processing
- D. D) Final outputs of the network used for classification

## Q9.

In a deep learning model, if the early layers capture basic features like edges and the later layers capture high-level features like objects, what is the likely impact of removing a few layers from the middle of the network?

A. A) The model will become faster without any loss in accuracy.

B. B) The model will only be able to detect basic features and miss complex patterns.

C. C) The model's final layer will directly learn from basic features, potentially reducing its ability to understand complex patterns.

D. D) There will be no impact as long as the input and output layers remain unchanged.

## Q10.

Considering the training process of a CNN on a dataset with highly imbalanced classes, which technique is most likely to improve the model's performance on minority classes?

A. A) Increasing the stride length in the convolutional layers

B. B) Using a larger kernel in the convolutional layers

C. C) Applying class weight adjustments during the training process

D. D) Reducing the number of filters in the convolutional layers