**Lab for Unit 3**

**Question 1:** **Arrange the following statements in order to describe the working of a neural network.**

* 2: The bias is added.
* 1: The weighted sum of the inputs is calculated.
* 4: Specific Neuron is activated.
* 3: The result is fed to an activation function.

Select the correct order.

* DABC 2. BADC

A neuron collects inputs from other neurons using dendrites. The neuron sums all the inputs and if the resulting value is greater than a threshold, it fires. The fired signal is then sent to other connected neurons through the axon

**Question 2: What is the correct architecture of convolutional neural network?**

* Input image Convolutions Pooling Fully Connected
* Input image Pooling Convolutions Fully Connected

It has three layers namely, convolutional, pooling, and a fully connected layer. It is a class of neural networks and processes data having a grid-like topology. The convolution layer is the building block of CNN carrying the main responsibility for computation.

**Question 3: What is the function of gradient descent in neural network?**

1. Find the minimum of a function of multiple variables.

2. Find the maximum of a function of multiple variables.

The goal of the gradient descent algorithm is to minimize the given function. To achieve this goal, it performs two steps iteratively: Compute the gradient (slope), the first order derivative of the function at that point.

**Question 4: Backpropagation is the method of fine-tuning the weights of a neural network based on the error rate obtained in the previous epoch (i.e., iteration).**

* False 2. True

Backpropagation is the essence of neural net training. It is the practice of fine-tuning the weights of a neural net based on the error rate (i.e. loss) obtained in the previous epoch (i.e. iteration.) Proper tuning of the weights ensures lower error rates, making the model reliable by increasing its generalization

**Question 5: What is the name of the following activation function?**



* Sigmoid 2. ReLU

The rectified linear activation function or ReLU for short is a piecewise linear function that will output the input directly if it is positive, otherwise, it will output zero.

**Homework :** Check the videos and references and suggest the task that can be solve using CNN

CNNs can be trained to classify images, detect objects in an image, and even predict the next word in a sentence with incredible accuracy. CNN is the evolution of the DeepLearning. I belive with this technology we can help Blind people see again .

**References:**

* [Deep Learning In 5 Minutes | What Is Deep Learning? | Deep Learning Explained Simply | HYPERLINK "https://www.youtube.com/watch?v=6M5VXKLf4D4&t=270s"Simplilearn HYPERLINK "https://www.youtube.com/watch?v=6M5VXKLf4D4&t=270s" – YouTube](https://www.youtube.com/watch?v=6M5VXKLf4D4&t=270s)
* [CS 230 - Convolutional Neural Networks HYPERLINK "https://stanford.edu/~shervine/teaching/cs-230/cheatsheet-convolutional-neural-networks"Cheatsheet HYPERLINK "https://stanford.edu/~shervine/teaching/cs-230/cheatsheet-convolutional-neural-networks" (stanford.edu)](https://stanford.edu/~shervine/teaching/cs-230/cheatsheet-convolutional-neural-networks)
* <http://education.sdsc.edu/training/201910_intro_to_deep_learning/recording/>
* [But what is a Neural Network? | Deep learning, chapter 1 - YouTube](https://www.youtube.com/watch?v=aircAruvnKk&list=RDCMUCYO_jab_esuFRV4b17AJtAw&index=1)
* [Gradient descent, how neural networks learn | Deep learning, chapter 2 - YouTube](https://www.youtube.com/watch?v=IHZwWFHWa-w)
* [What is backpropagation really doing? | Deep learning, chapter 3 - YouTube](https://www.youtube.com/watch?v=Ilg3gGewQ5U&list=RDCMUCYO_jab_esuFRV4b17AJtAw&index=2)
* [Backpropagation calculus | Deep learning, chapter 4 - YouTube](https://www.youtube.com/watch?v=tIeHLnjs5U8&list=RDCMUCYO_jab_esuFRV4b17AJtAw&index=3)