We used Tensorflow and keras API to develop and train our neural network model. Tensorflow is core open source library to develop and train the machine learning models. In our project we used MLP (Multilayer Perceptron) which is a feed forward neural network. MLP consist of at least three layers of neurons: input layer, output layer and at least one hidden layer and it uses backpropagation as supervised learning technique. MLP is widely used in solving the problems that require supervised learning approach which make it suitable for our project. Our MLP model have total six layers with four hidden layers and we used different non- linear activation function in our model.

We used the following activation functions in our model:

Tanh function: It is also known as tangent hyperbolic function it is mathematically shifted version of sigmoid activation function. The output of tanh function can range from -1 to 1 and hence center the data by bringing mean closer to 0, which make learning easier for next layer.

Or

RELU function: RELU stands for rectified linear unit, it is less expensive than tanh and sigmoid function because it involves less expensive mathematical operation. Using this function only some neurons are activate at single time which make network sparse which makes it more effective and make computation less complex. Relu learn much faster than sigmoid and tanh function.

ELU function: ELU stands for exponential linear unit, this generally converge cost to zero faster and produce more accurate result. ELU have extra alpha constant which should be a positive number, this is not present in any other activation function.

Linear function: This function is used specifically in the output layer because the derivative of this function is constant, and has no relation to input x.

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