EXPERIMENT NO 01

TensorFlow

TensorFlow is a popular framework of machine learning and deep learning. It is a free and open-source library which is released on 9 November 2015 and developed by Google Brain Team. It is entirely based on Python programming language and use for numerical computation and data flow, which makes machine learning faster and easier.
TensorFlow can train and run the deep neural networks for image recognition, handwritten digit classification, recurrent neural network, word embedding, natural language processing, and many more. TensorFlow is run on multiple CPUs or GPUs and mobile operating systems. The word TensorFlow is made by two words, i.e., Tensor and Flow
Tensor is a multidimensional array
Flow is used to define the flow of data in operation.
TensorFlow is used to define the flow of data in operation on a multidimensional array or Tensor.

TensorFlow abs () method

Function tf.abs() [alias tf.math.abs] provides support for the absolute function in Tensorflow. The input type is tensor and if the input contains more than one element, an element-wise absolute value is computed.
Syntax: tf.abs(x, name=None) or tf.math.abs(x, name=None)
Parameters:
x: A Tensor or SparseTensor of type float16, float32, float64, int32, int64, complex64 or complex128.
name (optional): The name for the operation.
Return type: A Tensor or SparseTensor with the same size and type as that of x with absolute values. For complex64 or complex128 input, the returned Tensor will be of type float32 or float64, respectively.

TensorFlow reciprocal () method

The module tensorflow.math provides support for many basic mathematical operations. Function tf.reciprocal() [alias tf.math.reciprocal] provides support to calculate the reciprocal of input in Tensorflow. It expects the input in form of complex numbers , floating point numbers and integers.
Syntax: tf.reciprocal(x, name=None) or tf.math.reciprocal(x, name=None)
Parameters:
x: A Tensor of type bfloat16, half, float32, float64, int32, int64, complex64 or complex128.
name (optional): The name for the operation.
Return type: A Tensor with the same size and type as that of x.

Keras

Keras is an open-source API used for solving a variety of modern machine learning and deep learning problems. It enables the user to focus more on the logical aspect of deep learning rather than the brute coding aspects. Keras is an extremely powerful API providing remarkable scalability, flexibility, and cognitive ease by reducing the user's workload. It is written in Python and uses TensorFlow or Theano as its backend.

The Functional API

The Functional API handles non-linear models with diverse functionalities. These models are extremely scalable and flexible. You can specify your neural network's forward pass starting right from the input and all the way down to the output to create personalized models. It provides a resilient architecture wherein pairs of layers can connect to multiple layers in any fashion. The functional API can be said to be a way to build graphs of layers and ad-hoc acyclic network graphs. This helps users tailor complex networks like the Siamese network with extreme ease.

The Sequential API

The Sequential API is a slightly less refined API for modelling simpler neural networks. Each layer in the network accepts only one input and passes on a single output. It is important to note that sequential models don't work when the model requires multiple inputs or outputs or when layers need to be shared.
A sequential model can only be used in a network that has a linear topology.