1 What is the difference between neural network and deep neural network?

There is a very simple difference between a simple neural network and a deep neural network.

A simple neural network is composed of the following: an input layer, a single hidden layer, and an output layer.

A deep neural network has one key difference: instead of having a single hidden layer, it has multiple hidden layers.

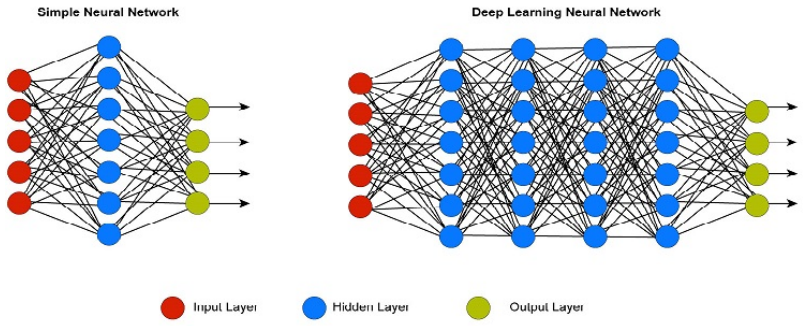

Figure 1

This allows the network to understand and emulate more complex and abstract behaviors.

2 Deep neural network: DNN

An artificial neural network (ANN) is a computational model based on the structure and functions of biological neural networks. It usually has a definite architecture. This architecture contributes a lot towards the performance of the neural network. Usually, there is an input layer, a hidden layer and an output layer. This architecture was acceptable for solving a number of problems. But the error rate was still quite high. Thus, a deep architecture of neural networks was developed.

A deep neural network has an input layer, many hidden layers and an output layer. This architecture was developed to improve accuracy, but at the cost of efficiency and its application was not possible until modern day GPUs came along to improve efficiency.

The accuracy of the neural networks were found to increase as the number of hidden layers increased. In other words, as the neural network got "deeper" in terms of architecture, it performed better and better. Although, that's just one factor that improves accuracy. There are also other factors which improve deep learning performance[1].

References:

[1] `https://machinelearningmastery.com/improve-deep-learning-performance/`