Deep learning is a subset of AI.

The central problem in ML(DL) is to meaningfully transform the data.

Deep learning is a multistage learning approach of a data representation.

No. of layers used in DL model is called the depth of the model.

In summary deep learning refers to the use of a number of layers of representation to transform the input into something more useful. These layered representations are learned via models called neural networks(building blocks of DL).

The specification of what a layer does to its input data is stored in the layer’s weights.

The loss score is used as a feedback signal to adjust the weights.

Loss function is the difference between the expected output and the current output.

In ML a category in a classification problem is called a class and the class connected with a specific sample is called a label.

All the input data is transformed to a generalized form which is a tensor. Tensors are generalizations of vectors and matrices to an arbitrary number of dimensions. Dimensions of a tensor are called axis.

Scalars are 0 dimensional tensors.(single number)

Vectors are one dimensional tensors.(array of numbers).Number of items in a vector is called rank of the tensor.

Matrices are 2 dimensional tensors.(has two axes rows and columns)

Array of matrices is a 3d tensor.

Selecting specific elements in a tensor is called tensor slicing.

Neural networks-chain of tensor operations-geometric transformations of the input data.

Setting up a neural network for training:

3 aspects to specify – loss function, an optimizer and metrics to monitor

CNN-images(healthcare), RNN-Recurrent(time-series)-sentiment analysis for understanding feedback of customers, Transformers(NLP) – natural language processing (chatbots).

Limitations of DL Models: Data dependency, overfitting, interpretability,

To summarize, ML is about mapping inputs (such as images) to outputs (target), such as the  
number 4. ML algorithms do this by learning from many samples that provide inputs and  
targets. Deep neural networks accomplish the same function by a multi-stage sequence of  
simple data transformations represented as layers that learn these examples.  
The specification of what a layer does to its input data is stored in the layer’s weights, which in  
essence are a bunch of numbers. These weights are the parameters of a layer.