Deep Learning

1. Deep learning neural network is inspired by brain neurons.
2. Feature learning or representation learning are similar task.
3. So in ML we need to give features by our self, like in **MNIST** dataset we converted 28 by 28 into features columns, and pass data into ML however in DL we do not need to convert it into features and DL layers detects every features by them self, initial layers detect minor features and subsequent layers detect major features.
4. In Deep learning we do not know features so we cannot explain and interpret or explain why this DL model is doing this but in ML we know features so it is interpretable.
5. High computational power required by DL but in ML it is not.
6. Deep leaning so cannot replace machine learning.

GPU uses parallel computation for matrix multiplication.

TPU tensor processing unit first developed by google

NPU neural processing unit.

Edge TPU

Drop down GUI: which gives both tensorflow and pytorch code of model.

- AutoML
- CreateML

Perceptron: it is single neuron having multiple weights and bias. In which z has multiplication of weights and input features and then adding of bias then this z is passed into activation function.

It has step function as activation function with output of only 0 and 1

Problem with perceptron is that, if we have nonlinear data so perceptron actually draw linear line so can not work.

Sklearn also have perceptron

Neural network also known as **UNIVERSAL FUNCTION APPROXIMATER**

Multi-layers Perceptron or ANN