Day 8: Data Science Interview Preparation

Q1. What is TensorFlow?

Ans: TensorFlow: TensorFlow is an open-source software library released in 2015 by Google to make it easier for the developers to design, build, and train deep learning models.

TensorFlow is originated as an internal library that the Google developers used to build the models in house, and we expect additional functionality to be added in the open-source version as they are tested and vetted in internal flavour.

Although TensorFlow is the only one of several options available to the developers and we choose to use it here because of thoughtful design and ease of use.

At a high level, TensorFlow is a Python library that allows users to express arbitrary computation as a graph of *data flows*.

Nodes in this graph represent mathematical operations, whereas edges represent data that is communicated from one node to another. Data in TensorFlow are represented as tensors, which are multidimensional arrays. Although this framework for thinking about computation is valuable in many different fields, TensorFlow is primarily used for deep learning in practice and research.

TensorFlow 2.0

| Easy	Powerful	Scalable
Simplified APIs. Focused on Keras and eager execution	Flexibility and performance. Power to do cutting edge research and scale to > 1 exaflops	Tested at Google-scale. Deploy everywhere

Q2. What are Tensors?

Ans: Tensor: In mathematics, it is an algebraic object that describes the linear mapping from one set of algebraic objects to the another.

Objects that the tensors may map between include, but are not limited to the vectors, scalars and recursively, even other tensors (for example, a matrix is the map between vectors and thus a tensor.

Therefore, the linear map between matrices is also the tensor). Tensors are inherently related to the vector spaces and their dual spaces and can take several different forms.

For example, a scalar, a vector, a dual vector at a point, or a multi-linear map between vector spaces.

Euclidean vectors and scalars are simple tensors. While tensors are defined as independent of any basis. The literature on physics, often referred by their components on a basis related to a particular coordinate system.
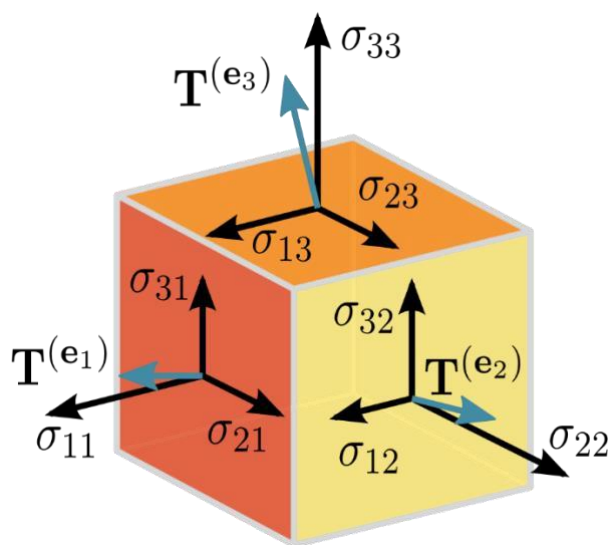
Q3. What is Tensor Board?

Ans: Tensor Board, a suit of visualising tools, is an easy solution to TensorFlow offered by the creators that lets you visualise the graphs, plot quantitative metrics about the graph with additional data like images to pass through it.
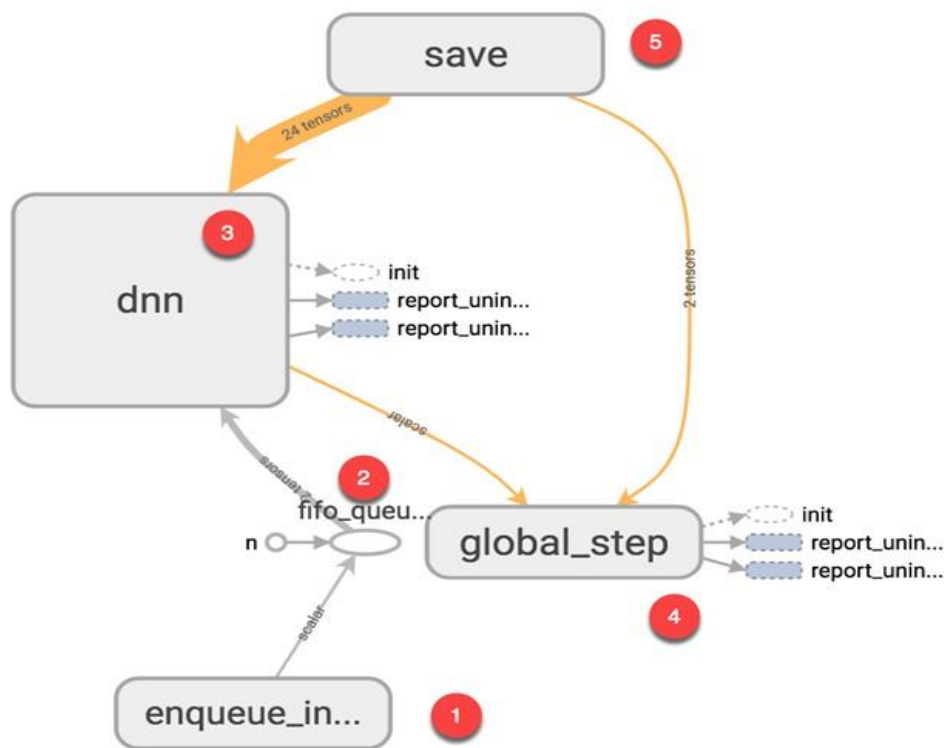
This one is some example of how the Tensor Board is working.

Q4. What are the features of TensorFlow?

Ans: Features:

- One of the main features of TensorFlow is its ability to build neural networks.
- By using these neural networks, machines can perform logical thinking and learn like humans.
- There are the other tensors for processing, such as data loading, pre-processing, calculation, state and outputs.
- It considered not only as deep learning but also as the library for performing the tensor calculations, and it is the most excellent library when considered as the deep learning framework that can also describe basic calculation processing.
- TensorFlow describes all calculation processes by calculation graph, no matter how simple the calculation is.

Q5. What are the advantages of TensorFlow?

Ans: Advantages

- It allows Deep Learning.
- It is open-source and free.
- It is reliable (and without major bugs)
- It is backed by Google and a good community.
- It is a skill recognised by many employers.
- It is easy to implement.

Q6. List a few limitations of Tensor Flow.

Ans:

- Has the GPU memory conflicts with Theano if imported in the same scope.
- It has dependencies with other libraries.
- Requires prior knowledge of the advanced calculus and linear algebra along with the good understanding of machine learning.

Q7. What are the use cases of Tensor flow?

Ans: Tensor Flow is an important tool of deep learning, it has mainly five use cases, and they are:
- Time Series
- Image recognition
- Sound Recognition
- Video detection
- Text-based Applications

Q8. What are the important steps of Tensor Flow architecture?

Ans: There are three main steps in the Tensor Flow architecture are:
- Pre-process the Data.
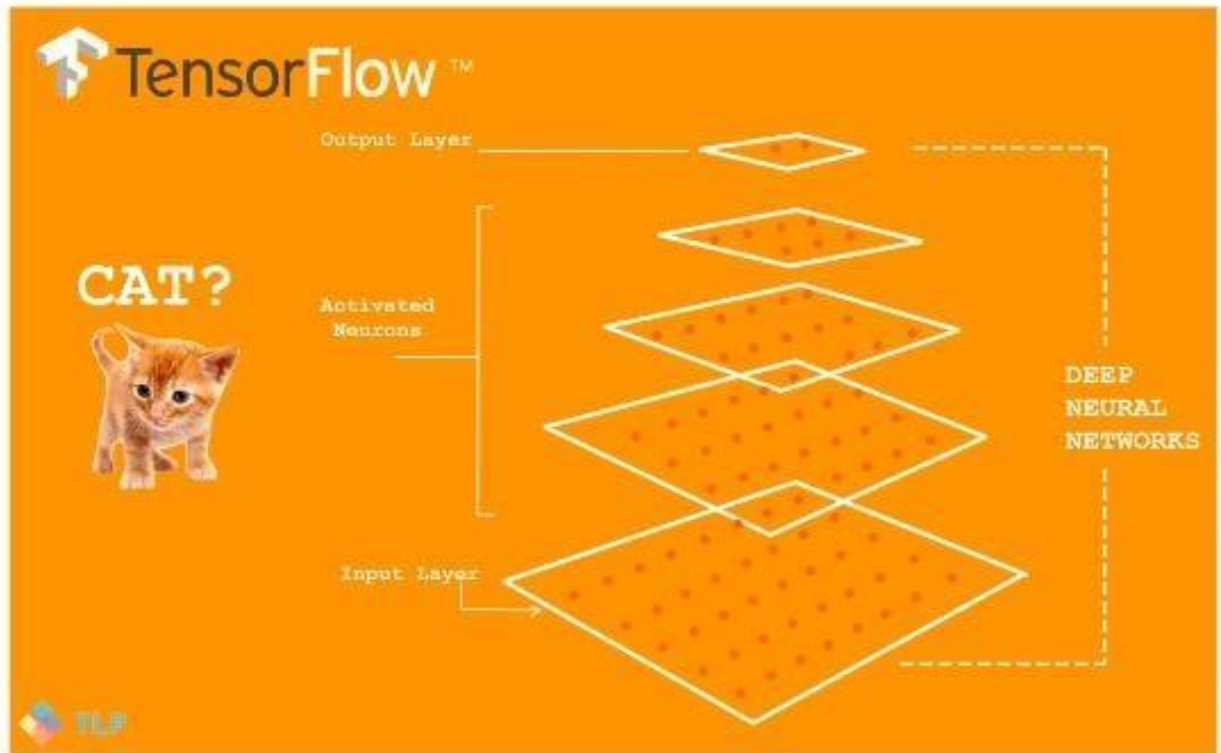- Build a Model.
- Train and estimate the model.

Image Recognition
Classification using Softmax Regressions and Convolutional Neural Networks

Q9. What is Keras?

Ans: Keras: It is an Open-Source Neural Network library written in Python that runs on the top of Theano or TensorFlow.
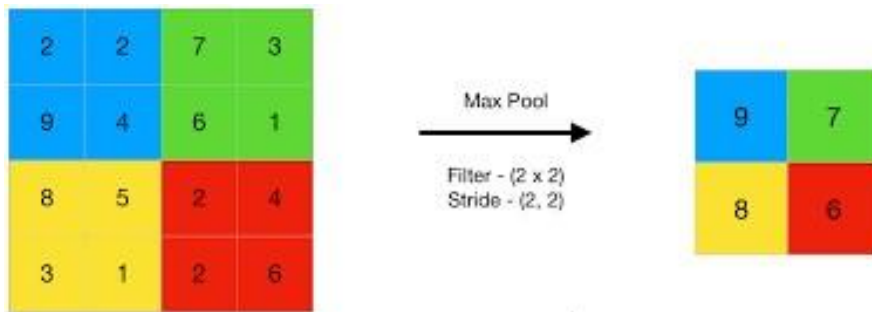
It is designed to be the modular, fast, and easy to use.

It was developed by François Chollet, a Google engineer.
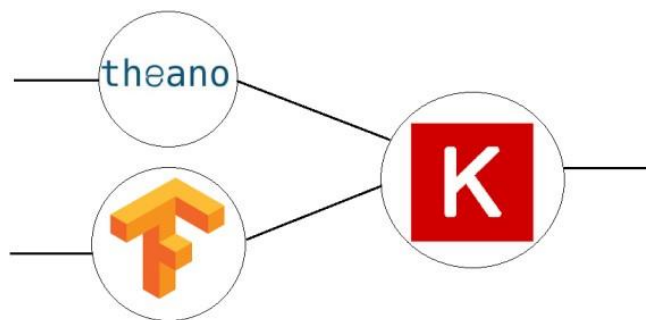
Q10. What is a pooling layer?

Ans: Pooling layer: It is generally used in reducing the spatial dimensions and not depth, on a convolutional neural network model.

Q11. What is the difference between CNN and RNN?

Ans:

CNN (Convolutional Neural Network)

- Best suited for spatial data like images
- CNN is powerful compared to RNN.
- This network takes a fixed type of inputs and outputs.
- These are the ideal for video and image processing.

RNN (Recurrent Neural Network)

- Best suited for sequential data
- RNN supports less feature set than CNN.
- This network can manage the arbitrary input and output lengths.
- It is ideal for text and speech analysis.

Q12. What are the benefits of Tensor Flow over other libraries?

Ans: The following benefits are:
- Scalability
- Visualisation of Data
- Debugging facility
- Pipelining