Advanced TensorFlow Interview Questions

1. What are some of the products that are built using TensorFlow?

There are many products that are built completely using TensorFlow. Some of them are as follows:

- Teachable Machine
- Handwriting Recognition
- Giorgio Cam
- NSynth

2. What is the meaning of Deep Speech?

Deep Speech is a speech-to-text engine that is open-source and uses TensorFlow. It is trained based on Machine Learning techniques and uses a simple syntax to process speech from an input to produce textual output on the other end.

The following syntax can be used to view all of the CLI options for Deep Speech:

```
1    ./deepspeech.py
```

3. What is the use of a histogram dashboard in TensorFlow?

Histogram dashboards are widely used to display complex statistical distributions of a tensor in a simple way. Every histogram chart will have a slice of data that denotes the data that the tensor has at the point of representation.

4. How is audio stored in the audio dashboard?

The audio dashboard serves to primarily help users embed playable widgets stored in files. Tf.summary.audio is used for the storage of these files, and the tagging system is used to embed the latest audio based on the storage policies.

5. What are some of the components needed to deploy a Lite model file?

In TensorFlow, three main components are used to deploy a Lite model:

1. Java API: Used as a wrapper around the C++ API for Android
2. C++ API: Used to load the TensorFlow Lite model and call the interpreter
3. Interpreter: Used to handle kernel loading and the execution of the model

6. What is TensorFlow JS?

TensorFlow JS is a library that gives users the functionality of using browsers to run Machine Learning models. High-level APIs work with JavaScript to support a variety of entities in the backend, such as WebGL, to use a GPU to render functionality (if available). Models can be imported, re-trained, and executed easily by just using a browser.

7. What are activation functions in TensorFlow?

Activation functions are functions applied to the output side of a neural network that serves to be the input of the next layer. It forms a very important part of **neural networks** as it provides nonlinearity that sets apart a neural network from logistic regression.

8. What is the code that is used to check the version of TensorFlow using Python?

There are two commands depending on the Python version:

Python 2:

```
1   python -c 'import tensor flow as tf; print(tf.__version__)'
```

Python 3:

```
1   python3 -c 'import tensor flow as tf; print(tf.__version__)'
```

9. What is model quantization in TensorFlow?

The process of handling the complexity that follows when optimizing inferences can be greatly minimized using TensorFlow. Model quantization is primarily used to reduce the representation of weights and also for the storage and computation of the activation function.

Using model quantization provides users with two main advantages:

- Support for a variety of CPU platforms
- SIMD instruction handling capabilities

10. What is the simple syntax that can be used to convert a NumPy array into a tensor?

There are two ways a NumPy array can be converted into a tensor when working with Python. The first one is as follows:

- **train.shuffle_batch()**

And the second way is:

- **convert_to_tensor(tensor1d, dtype = tf.float64)**

The high-level code offers a good amount of readability and ease-of-use and denoted by the above piece of code.

11. How is the weighted standard error computed in TensorFlow?

The weighted standard error is a standard metric that is used to compute the coefficient of determination when working with a linear regression model.

It provides an easy way to evaluate the model and can be used as shown below:

Used along with TFLearn estimators

```
1    weighted_r2 = WeightedR2()

2    regression = regression(net, metric=weighted_r2)
```

12. What are some of the commonly used optimizers when training a model in TensorFlow?

You can use many optimizers based on various factors, such as the learning rate, performance metric, dropout, gradient, and more.

Following are some of the popular optimizers:

- AdaDelta
- AdaGrad
- Adam
- Momentum
- RMSprop
- Stochastic Gradient Descent

13. What is the use of ArrayFlow and FeedDictFlow in TensorFlow?

ArrayFlow is used to convert array entities into tensors and store them automatically in a queue data structure.

- **data_flow.ArrayFlow()**

FeedDictFlow is used to generate a stream of batch data from the input dataset. The working is based on two queues, where one is used to generate batches and the other is used to load the data and apply preprocessing methods to it.

- **data_flow.FeedDictFlow()**

14. What are some of the parameters to consider when implementing the Word2vec algorithm in TensorFlow?

The Word2vec algorithm is used to compute the vector representations of words from an input dataset.

There are six parameters that have to be considered:

- **embedding_size**: Denotes the dimension of the embedding vector
- **max_vocabulary_size**: Denotes the total number of unique words in the vocabulary
- **min_occurrence**: Removes all words that do not appear at least 'n' number of times
- **skip_window**: Denotes words to be considered or not for processing
- **num_skips**: Denotes the number of times you can reuse an input to generate a label
- **num_sampled**: Denotes the number of negative examples to sample from the input

15. What are some of the important parameters to consider when implementing a random forest algorithm in TensorFlow?

There are six main parameters you should think about and plan when implementing a random forest algorithm in TensorFlow:

- Number of inputs
- Feature count
- Number of samples per batch
- Total number of training steps
- Number of trees
- Maximum number of nodes

16. What are some of the numerical and categorical loss functions supported when working with TensorFlow?

Following are some of the widely used numerical and categorical loss functions supported when working with TensorFlow:

Numerical loss functions:

- L1 loss
- L2 loss
- Pseudo-Huber loss

Categorical loss functions:

- Hinge loss
- Cross-entropy loss
- Sigmoid-entropy loss
- Weighted cross-entropy loss