Introduction to TensorFlow Operations: Takeaways

Syntax

- Create a tensor that contains all odd numbers between 1 and 15 using TensorFlow:

```
tf.range(start=1, limit=15, delta=2)
```

- Define a 2 X 3 constant with the `tf.constant()` function:

```
tf.constant([100, 200, 300, 400, 500, 600], shape=[2, 3])
```

- Define a variable tensor with the `tf.Variable()` constructor:

```
tf.Variable([1, 2, 3, 4, 5, 6])
```

- Convert a tensor `tensor_name` to NumPy array `numpy_array`

```
numpy_array = tensor_name.numpy() #method 1
numpy_array = numpy.array(tensor_name) #method 2
```

- Convert a NumPy array `numpy_array` to a tensor `tensor_name`:

```
tensor_name = tf.convert_to_tensor(numpy_array)
```

- Perform basic mathematical operations between two tensors `t1` and `t2` using the following code:

```
tf.add(t1, t2)
tf.subtract(t1, t2)
tf.multiply(t1, t2)
tf.divide(t1, t2)
```

- Use the `tf.math` module to perform advanced mathematical operations:

```
tf.math.log(t1)
tf.math.abs(t2)
tf.math.tanh(t3)
tf.math.sqrt(t4)
```

Concepts

- TensorFlow is an open source library developed by the Google Brain Team, which allows developers to create sophisticated machine learning and deep learning models with ease.
- TensorFlow supports multidimensional-array based numeric computation (similar to NumPy) and high-level APIs for building, training, and evaluating deep learning models.
- A tensor is an array of data that can be processed by TensorFlow. Constants are the simplest category of tensors that do not change and cannot be trained, but can have any dimension. Unlike a constant tensor, a variable tensor's value can change during computation.
- It's easy to convert tensors to NumPy arrays and vice versa.
- TensorFlow provides many modules to perform various mathematical operations on tensors.

Resources

- TensorFlow Installation
- Google Colab
- Tensors
- Tensor Operations
- TensorFlow Math Module