

Tensor operations part 1

Tip: You can find descriptions of the operations needed to complete tasks by typing the names operation in the "search" field in the upper right corner:

<https://www.tensorflow.org/>.

For example for tf.where type "tf where", etc.

Task 1

Write the function that:

- Will accept a tensor of any shape of tf.float32 type.
- It will multiply by itself element by element
- Subtracts a matrix composed of only ones of the same size
- Reset all values above 2
- Flatten the resulting matrix into a vector and return it

Call function for three tensors created by using the tf.random.uniform() operation with values in the range 0-10 with "shape" arguments:

- [5]
- [10, 5]
- [5, 7, 9]

Use the following operations: tf.random.uniform, tf.ones_like, tf.where, tf.reshape

Task 2

Write the function that:

- Will accept a 4x3 tensor (protect yourself against bad dimensions, e.g. by assert(...))
- Convert this tensor into a 6x2 tensor
- It will add an additional dimension to it in the zero axis and duplicate all values along this axis 5 times
- Will add to it a matrix with random values in the range 0-10 of the same shape (do not hardcode dimensions)
- Trim values below 3 and above 5 and return the resulting tensor

Call the function for a tensor of type tf.int32:

```
[[1, 2, 3, ], [2, 3, 4], [4, 5, 6], [5, 6, 7]]
```

Use the following operations: `tf.constant`, `tf.shape`, `tf.reshape`, `tf.expand_dims`, `tf.tile`, `tf.random.uniform`, `tf.clip_by_value`

Task 3

Write the function that:

- Will take two tensors of identical shape (protect against incompatible shapes)
- Generates a index tensor of all values equal to 2 in the first tensor
- Based on the index tensor, it will generate a vector with all values corresponding to these indices in the second tensor
- Calculates the average value from the resulting vector and multiplies it by the prime tensor
- Concatenation of the first tensor after multiplication and the second along the axis

Zero

- Reduce values along the zero axis to the maximum value and return the resulting Tensor

The function should be called for two tensors of type `tf.float32`:

```
[[1, 2, 3], [4, 3, 2], [5, 2, 3]] i [[78, 43, 23], [45, 77, 32], [99, 88, 77]]
```

Use the following operations: `tf.constant`, `tf.shape`, `tf.where`, `tf.gather`/`tf.gather_nd`, `tf.math.reduce_mean`, `tf.concat`, `tf.math.reduce_max`