



Deep Learning

Redes Neuronales con TensorFlow

Agosto 31

Tensores

Deep Learning

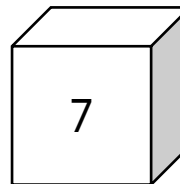
Redes Neuronales con TensorFlow

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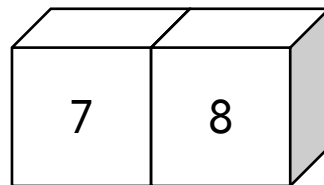
Tensores

- Tensores
- Código en TensorFlow
 - Indexación

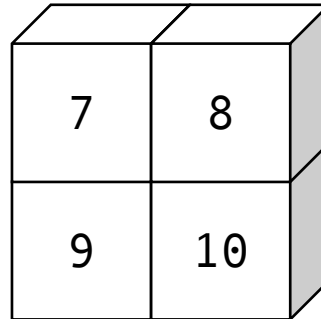
```
scalar = tf.constant(7)
```



```
vector = tf.constant([7,8])
```



```
matrix = tf.constant([[7, 8],  
                      [9, 10]])
```



7	8
9	10

```
tensor = tf.constant(  
    [[[1,2,3],  
      [4,5,6]],  
     [[7,8,9],  
      [10,11,12]],  
     [[13,14,15],  
      [16,17,18]]]  
).
```

1	2	3
4	5	6

7	8	9
10	11	12

13	14	15
16	17	18

```
tf.constant(numpy_arange(1,61), shape=(3,4,5))
```

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40

41	42	43	44	45
46	47	48	49	50
51	52	53	54	55
56	57	58	59	60

```
E = tf.constant(numpy_arange(1,61), shape=(3,4,5))
```

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40

41	42	43	44	45
46	47	48	49	50
51	52	53	54	55
56	57	58	59	60

```
>> E[:2]
```

```
>> E[:2, :2]
```

```
>> E[:2, :2, :2]
```

```
>> E[2]
```

```
>> E[2, 1]
```

```
>> E[2, 1, -1]
```

```
>> E[2, 1, -1]
```


QUESTION:

A "**tensor**" is one of the most basic data structures used in machine learning systems.

Let's go back to basics and focus on the fundamental characteristics of a tensor.

Which of the following are valid attributes that represent a tensor?

- Its number of axes. This attribute is also called the "rank" of the tensor.
- Its cardinality. This attribute represents the numerical relationship between the axes of the tensor.
- Its shape. This attribute represents the number of elements along each dimension.
- Its data type. This attribute represents the type of values contained in the tensor.

ANSWER:

Which of the following are valid attributes that represent a tensor

- Its number of axes. This attribute is also called the "rank" of the tensor.
- Its cardinality. This attribute represents the numerical relationship between the axes of the tensor.
- Its shape. This attribute represents the number of elements along each dimension.
- Its data type. This attribute represents the type of values contained in the tensor.

Explanation:

Three primary attributes define a tensor:

Its rank, or the number of axes.

Its shape, or the number of dimensions.

Its data type, or the type of data contained in it.

The rank of a tensor refers to the tensor's number of axes. Examples:

Rank of a matrix is 2.

Rank of a vector is 1.

Rank of a scalar is 0.

The shape of a tensor describes the number of elements along each dimension.

Examples:

() – scalar

(2,) – vector

(3, 2) – matrix

(3, 2, 5) – 3D tensor

Referencias

- Foto de portada: Joshua Hoehne

GRACIAS

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milioe

