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Mathematik-Grundlagen als eActivty mit ClassPad

Mittelwertberechnungen in TensorFlow

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https://www.dotnetperls.com/reduce-mean-tensorflow

ClassPad: Mittelwertberechnungen

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a:=[[100, 110], [10, 20], [1000, 1100]]

$$\begin{bmatrix} 100 & 110 \\ 10 & 20 \\ 1000 & 1100 \end{bmatrix}$$

c1:=matToList(a,1)

$$\{100, 10, 1000\}$$

Mittelwert der ersten Spalte:

mean(c1)

370

c2:=matToList(a,2)

$$\{110, 20, 1100\}$$

Mittelwert der zweiten Spalte:

mean(c2)

$$410$$

tensorflow: Spaltenmittel axis=0

c = tf.reduce_mean(a, axis=0) [370, 410]

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d1:=matToList(trn(a),1)

$$\{100, 110\}$$

Mittelwert der ersten Zeile:

mean(d1)

$$105$$

d2:=matToList(trn(a),2)

$$\{10, 20\}$$

Mittelwert der zweiten Zeile:

mean(d2)

$$15$$

d3:=matToList(trn(a),3)

$$\{1000, 1100\}$$

Mittelwert der dritten Zeile:

mean(d3)

$$1050$$

tensorflow: Zeilenmittel axis=1

d = tf.reduce_mean(a, axis=1) [105   15 1050]

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b:=augment(c1,c2)

$$\{100, 10, 1000, 110, 20, 1100\}$$

Mittelwert aller Elemente:

mean(ans)

tensorflow: b = tf.reduce_mean(a)   390

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Skript:

```
python3
import tensorflow as tf
a = tf.constant([[100, 110], [10, 20], [1000,
1100]])
# Use reduce_mean to compute the average (mean)
across a dimension.
b = tf.reduce_mean(a)
c = tf.reduce_mean(a, axis=0)
d = tf.reduce_mean(a, axis=1)
# Variablen initialisieren
init = tf.global_variables_initializer()
# Sitzung starten
with tf.Session() as sess:
    sess.run(init)
    # Ergebnisse anzeigen
    print("INPUT")
    print(sess.run(a))
    print("REDUCE MEAN")
    print(sess.run(b))
    print("REDUCE MEAN AXIS 0")
    print(sess.run(c))
```

```python
        print("REDUCE MEAN AXIS 1")
        print(sess.run(d))
```

==============================

Rechnerprotokoll:

```
parallels@parallels-Parallels-Virtual-Platform:~$ python3
Python 3.6.7 (default, Oct 22 2018, 11:32:17)
[GCC 8.2.0] on linux
Type "help", "copyright", "credits" or "license" for
more information.
>>> import tensorflow as tf
>>> a = tf.constant([[100, 110], [10, 20],
[1000, 1100]])
>>> # Use reduce_mean to compute the average
(mean) across a dimension.
... b = tf.reduce_mean(a)
>>> c = tf.reduce_mean(a, axis=0)
>>> d = tf.reduce_mean(a, axis=1)
>>> # Variablen initialisieren
... init = tf.global_variables_initializer()
>>> # Sitzung starten
... with tf.Session() as sess:
...         sess.run(init)
...         # Ergebnisse anzeigen
...         print("INPUT")
...         print(sess.run(a))
...         print("REDUCE MEAN")
...         print(sess.run(b))
```

```
...        print("REDUCE MEAN AXIS 0")
...        print(sess.run(c))
...        print("REDUCE MEAN AXIS 1")
...        print(sess.run(d))
...
INPUT
[[ 100   110]
 [  10    20]
 [1000 1100]]
REDUCE MEAN
390
REDUCE MEAN AXIS 0
[370 410]
REDUCE MEAN AXIS 1
[ 105    15 1050]
>>>
```

Download für dieses Dokument:

www.informatik.htw-dresden.de/
    ~paditz/Tensorflow-Ue12.pdf