In [1]:
```
import tensorflow as tf
```

In [2]:
```
import numpy as np
```

In [3]:
```
a=tf.constant(2)
b=tf.constant(3)
c=tf.constant(5)
add=tf.add(a,b)
sub=tf.subtract(a,b)
mul=tf.multiply(a,b)
div=tf.divide(a,b)
```

In [4]:
```
print(add)
```

```
tf.Tensor(5, shape=(), dtype=int32)
```

In [5]:
```
mean=tf.reduce_mean([a,b,c])
sum=tf.reduce_sum([a,b,c])
print("mean=",mean.numpy())
print("sum=",sum.numpy())
```

```
mean= 3
sum= 10
```

In [6]:
```
sum=tf.reduce_sum([a,b,c])
```

In [7]:
```
print("sum",sum.numpy())
```

```
sum 10
```

In [8]:
```
matrix1=tf.constant(([1,2],[3,4]))
matrix2=tf.constant(([5,6],[7,8]))
```

In [9]:
```
product=tf.matmul(matrix1,matrix2)
```

In [10]:
```
product.numpy()
```

Out[10]:
```
array([[19, 22],
       [43, 50]])
```

In [11]:
```
import tensorflow as tf
a=tf.constant([2,2,2])
b=tf.constant([1,1,1])
c=tf.add(a,b)
print(c)
```

```
tf.Tensor([3 3 3], shape=(3,), dtype=int32)
```

In [12]:
```
import tensorflow as tf
a=tf.constant([2,2,2])
b=tf.constant([1,1,1])
c=tf.subtract(a,b)
print(c)
```

```
tf.Tensor([1 1 1], shape=(3,), dtype=int32)
```

In [13]:
```
import tensorflow as tf
a=tf.constant([2,2,2])
b=tf.constant([1,1,1])
c=tf.multiply(a,b)
print(c)
```

```
tf.Tensor([2 2 2], shape=(3,), dtype=int32)
```

In [15]:
```
import tensorflow as tf
a=tf.constant([2,2,2])
b=tf.constant([1,1,1])
c=tf.divide(a,b)
print(c)
```

```
tf.Tensor([2. 2. 2.], shape=(3,), dtype=float64)
```

In [18]:
```
import tensorflow as tf
a=tf.constant([2,2,2,5,6,8])

b=tf.reshape(a,[2,3])
print(b)
```

```
tf.Tensor(
[[2 2 2]
 [5 6 8]], shape=(2, 3), dtype=int32)
```

In [21]:
```
import tensorflow as tf
a=tf.constant([[2,2],[2,2]])
b=tf.constant([[2,3],[4,5]])
c=tf.matmul(a,b)
print(c)
```

```
tf.Tensor(
[[12 16]
 [12 16]], shape=(2, 2), dtype=int32)
```

In [22]:
```
import tensorflow as tf
a=tf.random.normal([1,2,3])
b=tf.random.normal([2,2,3])
c=tf.concat([a,b], axis=0)
print(c)
```

```
tf.Tensor(
[[[-1.2761588   0.34034565 -0.70117956]
  [ 0.23339489  0.19444352  0.418543  ]]

 [[ 0.35180974 -0.03661675 -0.7237034 ]
  [-1.3185083   1.7374517   0.10871917]]

 [[ 0.6623229  -0.20586278 -0.5840911 ]
  [ 1.1188718  -0.73218095 -0.02214444]]], shape=(3, 2, 3), dtype=float32)
```

In [24]:
```
a=tf.random.normal([2,3])
b=tf.random.normal([2,3])
c=tf.stack([a,b], axis=0)
print(c)
```

```
tf.Tensor(
[[[ 0.34932297  0.7783995  -2.9169683 ]
  [ 1.3166437  -1.6913929   0.45694888]]

 [[-1.1546842   0.1847522   0.61451316]
  [-0.579225    0.5681399  -0.7699581 ]]], shape=(2, 2, 3), dtype=float32)
```

In [25]:
```
d=tf.stack([a,b], axis=-1)
print(d)
```

```
tf.Tensor(
[[[ 0.34932297 -1.1546842 ]
  [ 0.7783995   0.1847522 ]
  [-2.9169683   0.61451316]]

 [[ 1.3166437  -0.579225  ]
  [-1.6913929   0.5681399 ]
  [ 0.45694888 -0.7699581 ]]], shape=(2, 3, 2), dtype=float32)
```

In [26]:
```
x=tf.random.normal([3,2,3])
print(x)
```

```
tf.Tensor(
[[[ 0.32958657 -1.0724066   0.3157689 ]
  [-0.4373825  -0.59549016 -0.82502455]]

 [[ 0.25998223  0.7334877   1.3373165 ]
  [-0.56293947 -0.99814975 -0.3867063 ]]

 [[ 0.572387   -0.75688154  0.1932725 ]
  [-0.60311383 -0.2616894   0.884903  ]]], shape=(3, 2, 3), dtype=float32)
```

In [27]:
```
result = tf.split(x, axis=0,num_or_size_splits = 3)
print(result)
```

```
[<tf.Tensor: shape=(1, 2, 3), dtype=float32, numpy=
array([[[ 0.32958657, -1.0724066 ,  0.3157689 ],
        [-0.4373825 , -0.59549016, -0.82502455]]], dtype=float32)>, <tf.Tensor:
shape=(1, 2, 3), dtype=float32, numpy=
array([[[ 0.25998223,  0.7334877 ,  1.3373165 ],
        [-0.56293947, -0.99814975, -0.3867063 ]]], dtype=float32)>, <tf.Tensor:
shape=(1, 2, 3), dtype=float32, numpy=
array([[[ 0.572387  , -0.75688154,  0.1932725 ],
        [-0.60311383, -0.2616894 ,  0.884903  ]]], dtype=float32)>]
```

In [29]:
```
#unstack
x=tf.random.normal([3,2,3])
print(x)
result = tf.unstack(x, axis=0)
print(result)
```

```
tf.Tensor(
[[[ 0.96458054 -0.9751225  -0.31031626]
  [-0.7720665   0.35881582 -2.629395  ]]

 [[-1.4602741   0.6140301   0.18816948]
  [ 1.4608036   0.4207847  -1.3727998 ]]

 [[ 1.5002859  -3.3457026  -0.28258178]
  [-0.39477164 -0.61732095 -0.57950974]]], shape=(3, 2, 3), dtype=float32)
[<tf.Tensor: shape=(2, 3), dtype=float32, numpy=
array([[ 0.96458054, -0.9751225 , -0.31031626],
       [-0.7720665 ,  0.35881582, -2.629395  ]], dtype=float32)>, <tf.Tensor: sh
ape=(2, 3), dtype=float32, numpy=
array([[-1.4602741 ,  0.6140301 ,  0.18816948],
       [ 1.4608036 ,  0.4207847 , -1.3727998 ]], dtype=float32)>, <tf.Tensor: sh
ape=(2, 3), dtype=float32, numpy=
array([[ 1.5002859 , -3.3457026 , -0.28258178],
       [-0.39477164, -0.61732095, -0.57950974]], dtype=float32)>]
```

In [ ]:
```
#tensor comparision and sort
```