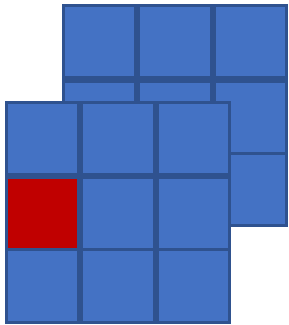


Lesson 22: Accessing the element of a Tensor

Extract a slice from a tensor

```
tf.slice(<input>,<begin>,<size>)
```

- **input**: Tensor
- **begin**: starting location for each dimension of **input**
- **size**: number of elements for each dimension of **input**, using **-1** includes all remaining elements



Shape: [2, 3, 3]

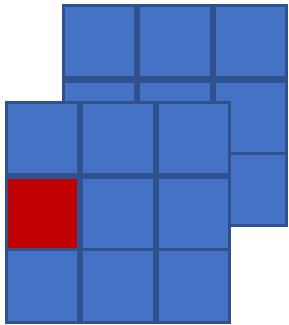
Begin: [0, 1, 0]

Size: [1, 1, 1]

Extract a slice from a tensor

`tf.slice(<input>, <begin>, <size>)`

- **input**: Tensor
- **begin**: starting location for each dimension of **input**
- **size**: number of elements for each dimension of **input**, using **-1** includes all remaining elements



Shape: [2, 3, 3]

Begin: [0, 1, 0]

Size: [1, 1, 1]

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

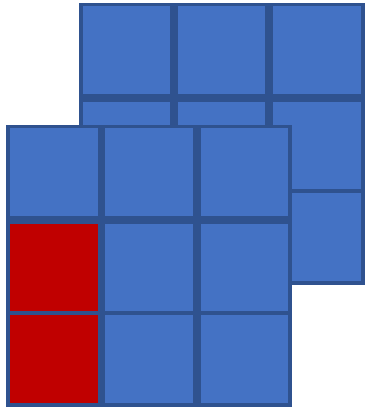
```
res = tf.slice(x, [0, 1, 0], [1, 1, 1])
print("\n")
print(res)
```

```
tf.Tensor(
[[[ 1.  2.  3.]
 [ 4.  5.  6.]
 [ 7.  8.  9.]]

[[10. 11. 12.]
 [13. 14. 15.]
 [16. 17. 18.]]], shape=(2, 3, 3), dtype=float32)
```

```
tf.Tensor([[[[4.]]], shape=(1, 1, 1), dtype=float32)
```

Extract a slice from a tensor

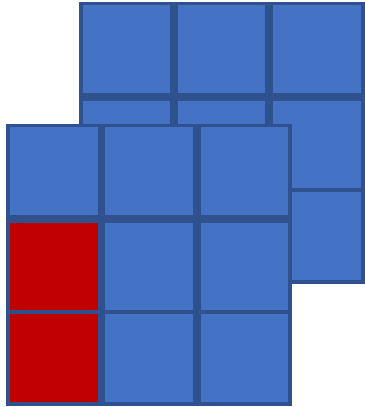


Shape: [2, 3, 3]

Begin: [0, 1, 0]

Size:

Extract a slice from a tensor



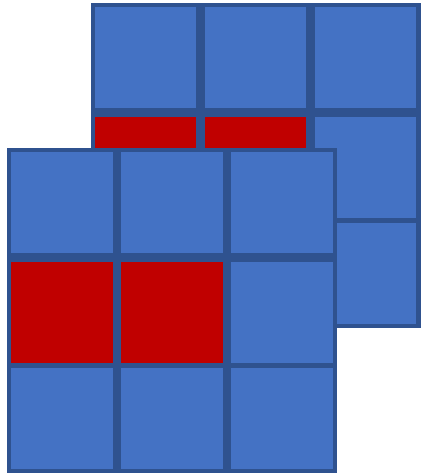
```
import tensorflow as tf
x = tf.constant([[[1., 2., 3.], [4., 5., 6.], [7., 8., 9.]],
                [[10., 11., 12.], [13., 14., 15.], [16., 17., 18.]])
print(x)
```

```
res = tf.slice(x, [0, 1, 0], [1, 2, 1])
print("\n")
print(res)
```

```
tf.Tensor(
[[[ 1.  2.  3.]
 [ 4.  5.  6.]
 [ 7.  8.  9.]]
 [[10. 11. 12.]
 [13. 14. 15.]
 [16. 17. 18.]]], shape=(2, 3, 3), dtype=float32)
```

```
tf.Tensor(
[[[4.]
 [7.]]], shape=(1, 2, 1), dtype=float32)
```

Extract a slice from a tensor

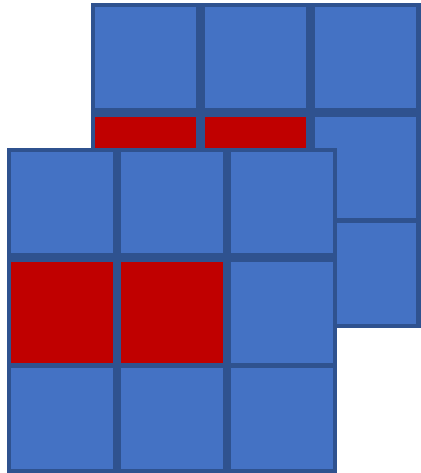


Shape: [2, 3, 3]

Begin: [0, 1, 0]

Size:

Extract a slice from a tensor



Shape: [2, 3, 3]

Begin: [0, 1, 0]

Size:

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

```
res = tf.slice(x, [0, 1, 0], [2, 1, 2])
print("\n")
print(res)
```

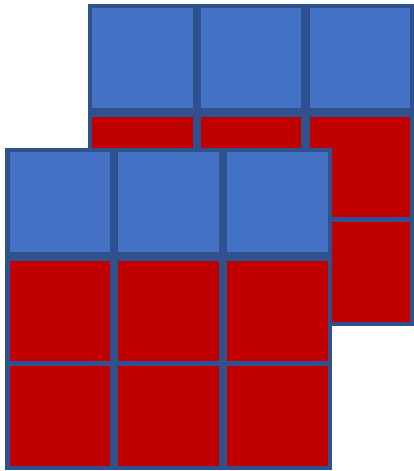
```
tf.Tensor(
[[[ 1.  2.  3.]
 [ 4.  5.  6.]
 [ 7.  8.  9.]]

[[10. 11. 12.]
 [13. 14. 15.]
 [16. 17. 18.]], shape=(2, 3, 3), dtype=float32)
```

```
tf.Tensor(
[[[ 4.  5.]]

[[13. 14.]]], shape=(2, 1, 2), dtype=float32)
```

Extract a slice from a tensor

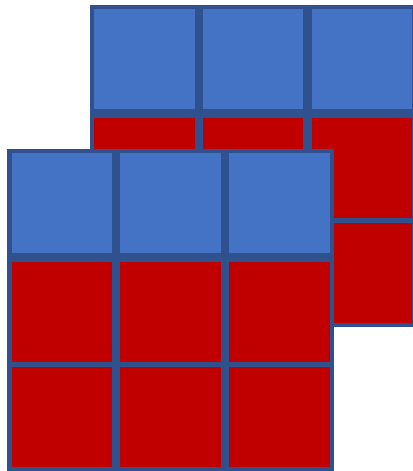


Shape: [2, 3, 3]

Begin: [0, 1, 0]

Size:

Extract a slice from a tensor



Shape: [2, 3, 3]

Begin: [0, 1, 0]

Size:

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

res = tf.slice(x, [0, 1, 0], [-1, -1, -1])
print("\n")
print(res)
```

```
tf.Tensor(
[[[ 1.  2.  3.]
 [ 4.  5.  6.]
 [ 7.  8.  9.]]

[[10. 11. 12.]
 [13. 14. 15.]
 [16. 17. 18.]]], shape=(2, 3, 3), dtype=float32)
```

```
tf.Tensor(
[[[ 4.  5.  6.]
 [ 7.  8.  9.]]

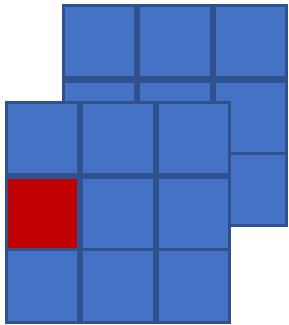
[[13. 14. 15.]
 [16. 17. 18.]]], shape=(2, 2, 3), dtype=float32)
```

Lesson 5: Accessing the element of a Tensor

Extract a slice from a tensor

```
tf.slice(<input>,<begin>,<size>)
```

- **input**: Tensor
- **begin**: starting location for each dimension of **input**
- **size**: number of elements for each dimension of **input**, using **-1** includes all remaining elements



Shape: [2, 3, 3]

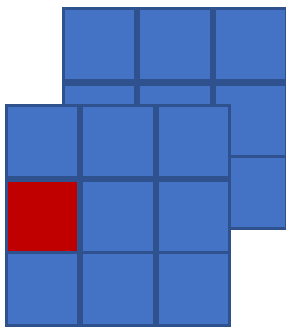
Begin: [0, 1, 0]

Size: [1, 1, 1]

Extract a slice from a tensor

`tf.slice(<input>, <begin>, <size>)`

- **input**: Tensor
- **begin**: starting location for each dimension of **input**
- **size**: number of elements for each dimension of **input**, using **-1** includes all remaining elements



Shape: [2, 3, 3]

Begin: [0, 1, 0]

Size: [1, 1, 1]

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

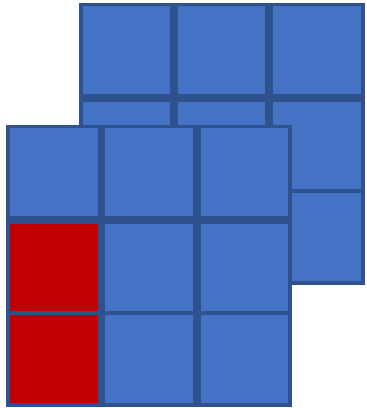
```
res = tf.slice(x, [0, 1, 0], [1, 1, 1])
print("\n")
print(res)
```

```
tf.Tensor(
[[[ 1.  2.  3.]
 [ 4.  5.  6.]
 [ 7.  8.  9.]]

[[10. 11. 12.]
 [13. 14. 15.]
 [16. 17. 18.]]], shape=(2, 3, 3), dtype=float32)
```

```
tf.Tensor([[[[4.]]], shape=(1, 1, 1), dtype=float32)
```

Extract a slice from a tensor

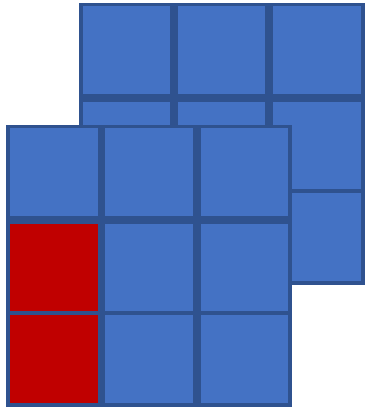


Shape: [2, 3, 3]

Begin: [0, 1, 0]

Size:

Extract a slice from a tensor



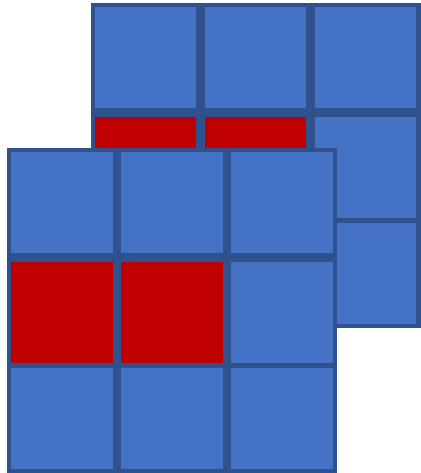
```
import tensorflow as tf
x = tf.constant([[[1., 2., 3.], [4., 5., 6.], [7., 8., 9.]],
                [[10., 11., 12.], [13., 14., 15.], [16., 17., 18.]])
print(x)
```

```
res = tf.slice(x, [0, 1, 0], [1, 2, 1])
print("\n")
print(res)
```

```
tf.Tensor(
[[[ 1.  2.  3.]
 [ 4.  5.  6.]
 [ 7.  8.  9.]]
 [[10. 11. 12.]
 [13. 14. 15.]
 [16. 17. 18.]]], shape=(2, 3, 3), dtype=float32)
```

```
tf.Tensor(
[[[4.]
 [7.]]], shape=(1, 2, 1), dtype=float32)
```

Extract a slice from a tensor

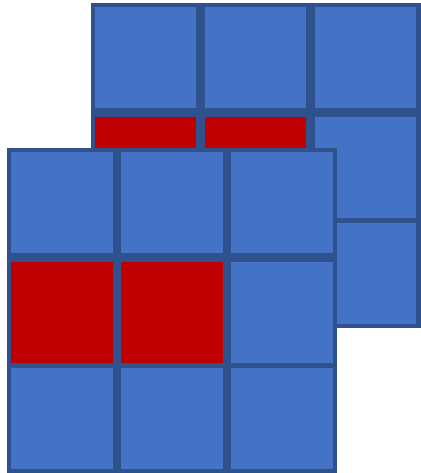


Shape: [2, 3, 3]

Begin: [0, 1, 0]

Size:

Extract a slice from a tensor



Shape: [2, 3, 3]

Begin: [0, 1, 0]

Size:

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

```
res = tf.slice(x, [0, 1, 0], [2, 1, 2])
print("\n")
print(res)
```

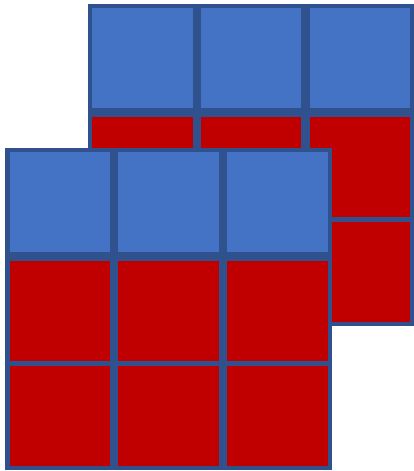
```
tf.Tensor(
[[[ 1.  2.  3.]
 [ 4.  5.  6.]
 [ 7.  8.  9.]]

[[10. 11. 12.]
 [13. 14. 15.]
 [16. 17. 18.]]], shape=(2, 3, 3), dtype=float32)
```

```
tf.Tensor(
[[[ 4.  5.]]

[[13. 14.]]], shape=(2, 1, 2), dtype=float32)
```


Extract a slice from a tensor

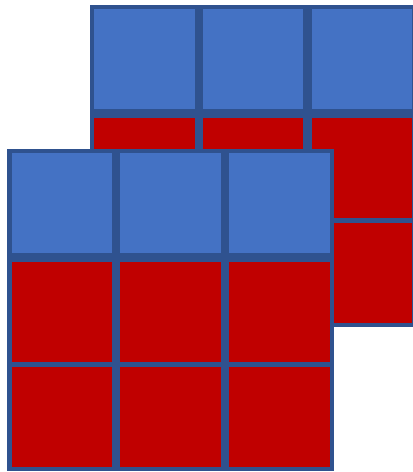


Shape: [2, 3, 3]

Begin: [0, 1, 0]

Size:

Extract a slice from a tensor



Shape: [2, 3, 3]

Begin: [0, 1, 0]

Size:

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

res = tf.slice(x, [0, 1, 0], [-1, -1, -1])
print("\n")
print(res)
```

```
tf.Tensor(
[[[ 1.  2.  3.]
 [ 4.  5.  6.]
 [ 7.  8.  9.]]

[[10. 11. 12.]
 [13. 14. 15.]
 [16. 17. 18.]]], shape=(2, 3, 3), dtype=float32)
```

```
tf.Tensor(
[[[ 4.  5.  6.]
 [ 7.  8.  9.]]

[[13. 14. 15.]
 [16. 17. 18.]]], shape=(2, 2, 3), dtype=float32)
```