

# tensor.matmul

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```
Copy fnmatmul(self:@Tensor, other:@Tensor)->Tensor;
```

...

Performs matrix product of two tensors. The behavior depends on the dimensionality of the tensors as follows:

- If both tensors are 1-dimensional, the dot product is returned.
- If both arguments are 2-dimensional, the matrix-matrix product is returned.
- If the first argument is 1-dimensional and the second argument is 2-dimensional, a 1 is prepended to its dimension for the purpose of the matrix multiply. After the matrix multiply, the prepended dimension is removed.
- If the first argument is 2-dimensional and the second argument is 1-dimensional, the matrix-vector product is returned.
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## Args

- self
- (@Tensor
- ) - the first tensor to be multiplied
- other
- (@Tensor
- ) - the second tensor to be multiplied
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## Panics

- Panics if the dimension of the tensors is higher than two.
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## Returns

A newTensor resulting from the matrix multiplication.

## Examples

Case 1: Dot product of two vectors (1D \* 1D)

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```
Copy usecore::array::{ArrayTrait,SpanTrait};
```

```
useorion::operators::tensor::{TensorTrait,Tensor,U32Tensor};
```

```
findot_product_example()->Tensor { lettensor_1=TensorTrait::new(shape:array![3].span(), data:array![0,1,2].span(),);
```

```
lettensor_2=TensorTrait::new(shape:array![3].span(), data:array![0,1,2].span(),);
```

```
// We can call matmul function as follows. returntensor_1.matmul(@tensor_2); }
```

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Case 2: Matrix multiplication (2D \* 2D)

...

```
Copy usecore::array::{ArrayTrait,SpanTrait};
```

```
useorion::operators::tensor::{TensorTrait,Tensor,U32Tensor};
```

```
fnmatrix_mul_example()->Tensor { lettensor_1=TensorTrait::new( shape:array![2,2].span(), data:array![244,99,109,162].span() );
```

```
lettensor_2=TensorTrait::new( shape:array![2,2].span(), data:array![151,68,121,170].span() );
```

```
// We can call matmul function as follows. returntensor_1.matmul(@tensor_2); }
```

[[48823,33422],[36061,34952]]

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Case 3: Matrix-Vector multiplication (2D x 1D)

...

Copy usecore::array::{ArrayTrait,SpanTrait};

use orion::operators::tensor::{TensorTrait,Tensor,U32Tensor};

fn matrix\_vec\_mul\_example()->Tensor { let tensor\_1=TensorTrait::new( shape:array![3,3].span(), data:array![0,1,2,3,4,5,6,7,8].span(), );

let tensor\_2=TensorTrait::new(shape:array![3].span(), data:array![0,1,2].span(),);

// We can call matmul function as follows. return tensor\_1.matmul(@tensor\_2); }

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