numpy.linalg.inv

linalg.inv(*a*) [source]

Compute the (multiplicative) inverse of a matrix.

Given a square matrix *a*, return the matrix *ainv* satisfying `dot(a, ainv) = dot(ainv, a) = eye(a.shape[0])`.

Parameters: **a** : *(..., M, M) array_like*
Matrix to be inverted.

Returns: **ainv** : *(..., M, M) ndarray or matrix*
(Multiplicative) inverse of the matrix *a*.

Raises: **LinAlgError**
If *a* is not square or inversion fails.

See also

scipy.linalg.inv
Similar function in SciPy.

Notes

New in version 1.8.0.

Broadcasting rules apply, see the **numpy.linalg** documentation for details.

Examples

```
>>> from numpy.linalg import inv
>>> a = np.array([[1., 2.], [3., 4.]])
>>> ainv = inv(a)
>>> np.allclose(np.dot(a, ainv), np.eye(2))
True
>>> np.allclose(np.dot(ainv, a), np.eye(2))
True
```

If a is a matrix object, then the return value is a matrix as well:

```
>>> ainv = inv(np.matrix(a))
>>> ainv
matrix([[-2. ,  1. ],
        [ 1.5, -0.5]])
```

Inverses of several matrices can be computed at once:

```
>>> a = np.array([[[1., 2.], [3., 4.]], [[1, 3], [3, 5]]])
>>> inv(a)
array([[[-2.  ,  1.  ],
        [ 1.5 , -0.5 ]],
       [[-1.25,  0.75],
        [ 0.75, -0.25]]])
```

Previous numpy.linalg.lstsq
Next numpy.linalg.pinv

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