NumPy - Array Creation Routines

A new **ndarray** object can be constructed by any of the following array creation routines or using a low-level ndarray constructor.

numpy.empty

It creates an uninitialized array of specified shape and dtype. It uses the following constructor −

```
numpy.empty(shape, dtype = float, order = 'C')
```

The constructor takes the following parameters.

Sr.No.	Parameter & Description
1	**Shape** Shape of an empty array in int or tuple of int
2	**Dtype** Desired output data type. Optional
3	**Order** 'C' for C-style row-major array, 'F' for FORTRAN style column-major array

Example

The following code shows an example of an empty array.

Live Demo

```
import numpy as np

x = np.empty([3,2], dtype = int)

print x
```

The output is as follows −

```
[[22649312    1701344351]
 [1818321759  1885959276]
 [16779776    156368896]]
```

Note – The elements in an array show random values as they are not initialized.

numpy.zeros

Returns a new array of specified size, filled with zeros.

```
numpy.zeros(shape, dtype = float, order = 'C')
```

The constructor takes the following parameters.

Sr.No.	Parameter & Description
1	**Shape** Shape of an empty array in int or sequence of int
2	**Dtype** Desired output data type. Optional
3	**Order** 'C' for C-style row-major array, 'F' for FORTRAN style column-major array

Example 1

Live Demo

```python
# array of five zeros. Default dtype is float

import numpy as np

x = np.zeros(5)

print x
```

The output is as follows −

```
[ 0.  0.  0.  0.  0.]
```

Example 2

```python
import numpy as np

x = np.zeros((5,), dtype = np.int)

print x
```

Now, the output would be as follows −

```
[0 0 0 0 0]
```

Example 3

```python
# custom type
import numpy as np

x = np.zeros((2,2), dtype = [('x', 'i4'), ('y', 'i4')])

print x
```

It should produce the following output −

```
[[(0,0)(0,0)]
 [(0,0)(0,0)]]
```

numpy.ones

Returns a new array of specified size and type, filled with ones.

```
numpy.ones(shape, dtype = None, order = 'C')
```

The constructor takes the following parameters.

Sr.No.	Parameter & Description
1	**Shape** Shape of an empty array in int or tuple of int
2	**Dtype**

		Desired output data type. Optional
3	**Order** 'C' for C-style row-major array, 'F' for FORTRAN style column-major array	

Example 1

```python
# array of five ones. Default dtype is float
import numpy as np
x = np.ones(5)
print x
```

The output is as follows −

```
[ 1.  1.  1.  1.  1.]
```

Example 2

```python
import numpy as np
x = np.ones([2,2], dtype = int)
print x
```

Now, the output would be as follows −

```
[[1  1]
 [1  1]]
```