1.4-Numpy Operations

KeytoDataScience.com

Table of Contents

💡💡💡💡💡 **Getting Started** 💡💡💡💡💡

---

1 Arithmetic

You can easily perform array with array arithmetic, or scalar with array arithmetic. Let's see some examples:

In [1]:
```
import numpy as np
arr = np.arange(0,10)
```

In [2]:
```
arr + arr
```

Out[2]:
```
array([ 0,  2,  4,  6,  8, 10, 12, 14, 16, 18])
```

In [3]:
```
arr * arr
```

Out[3]:
```
array([ 0,  1,  4,  9, 16, 25, 36, 49, 64, 81])
```

In [4]:
```
arr - arr
```

Out[4]:
```
array([0, 0, 0, 0, 0, 0, 0, 0, 0, 0])
```

In [5]:
```
# Warning on division by zero, but not an error!
# Just replaced with nan
arr/arr
```

Out[5]:
```
C:\Users\Prateek\AppData\Local\Temp/ipykernel_12852/2878212635.py:3: RuntimeWarning: inv
alid value encountered in true_divide
  arr/arr
array([nan,  1.,  1.,  1.,  1.,  1.,  1.,  1.,  1.,  1.])
```

In [6]:
```
# Also warning, but not an error instead infinity
1/arr
```

```
C:\Users\Prateek\AppData\Local\Temp/ipykernel_12852/1360216608.py:2: RuntimeWarning: div
ide by zero encountered in true_divide
  1/arr
```

Out[6]:
```
array([       inf, 1.        , 0.5       , 0.33333333, 0.25      ,
       0.2       , 0.16666667, 0.14285714, 0.125     , 0.11111111])
```

In [7]:
```
arr**3
```

Out[7]:
```
array([  0,   1,   8,  27,  64, 125, 216, 343, 512, 729], dtype=int32)
```

↥ back to top

2 Universal Array Functions

Numpy comes with many universal array functions, which are essentially just mathematical operations you can use to perform the operation across the array. Let's show some common ones:

In [8]:
```
#Taking Square Roots
np.sqrt(arr)
```

Out[8]:
```
array([0.        , 1.        , 1.41421356, 1.73205081, 2.        ,
       2.23606798, 2.44948974, 2.64575131, 2.82842712, 3.        ])
```

In [9]:
```
#Calcualting exponential (e^)
np.exp(arr)
```

Out[9]:
```
array([1.00000000e+00, 2.71828183e+00, 7.38905610e+00, 2.00855369e+01,
       5.45981500e+01, 1.48413159e+02, 4.03428793e+02, 1.09663316e+03,
       2.98095799e+03, 8.10308393e+03])
```

In [10]:
```
np.max(arr) #same as arr.max()
```

Out[10]:
```
9
```

In [11]:
```
np.sin(arr)
```

Out[11]:
```
array([ 0.        ,  0.84147098,  0.90929743,  0.14112001, -0.7568025 ,
       -0.95892427, -0.2794155 ,  0.6569866 ,  0.98935825,  0.41211849])
```

In [12]:
```
np.log(arr)
```

```
C:\Users\Prateek\AppData\Local\Temp/ipykernel_12852/3120950136.py:1: RuntimeWarning: div
ide by zero encountered in log
  np.log(arr)
```

Out[12]:
```
array([      -inf, 0.        , 0.69314718, 1.09861229, 1.38629436,
       1.60943791, 1.79175947, 1.94591015, 2.07944154, 2.19722458])
```

↥ back to top

That's all we need to know for now!

Great Job!
