Module 02

Numpy Operations

Data Science Developer

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Arithmetic

```
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])
```

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Arithmetic

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

        C:\Users\harto\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: Ru
          This is separate from the ipykernel package so we can avoid doing im

Out[5]: 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\harto\Anaconda3\lib\site-packages\ipykernel_launcher.py:2: Ru

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)
```

Universal Array Functions

```
In [12]: #Taking Square Roots
         np.sqrt(arr)

Out[12]: array([ 0.        ,  1.        ,  1.41421356,  1.73205081,  2.        ,
                 2.23606798,  2.44948974,  2.64575131,  2.82842712,  3.        ])
```

```
In [13]: #Calcualting exponential (e^)
         np.exp(arr)

Out[13]: 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 [14]: np.max(arr) #same as arr.max()

Out[14]: 9
```

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Universal Array Functions

```
In [15]: np.sin(arr)

Out[15]: array([ 0.        ,  0.84147098,  0.90929743,  0.14112001, -0.7568025 ,
               -0.95892427, -0.2794155 ,  0.6569866 ,  0.98935825,  0.41211849])

In [16]: np.log(arr)

         /Users/marci/anaconda/lib/python3.5/site-packages/ipykernel/__main__.py:1
           if __name__ == '__main__':

Out[16]: array([       -inf,  0.        ,  0.69314718,  1.09861229,  1.38629436,
                 1.60943791,  1.79175947,  1.94591015,  2.07944154,  2.19722458])
```

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