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deep-learning-specialization-coursera / 01-Neural-Networks-and-Deep-Learning / week2 / 02-vectorization.ipynb

andersy005 add package version information

a5888a3 on Oct 14, 2018

1 contributor

Raw Blame History

426 lines (426 sloc) 9.44 KB

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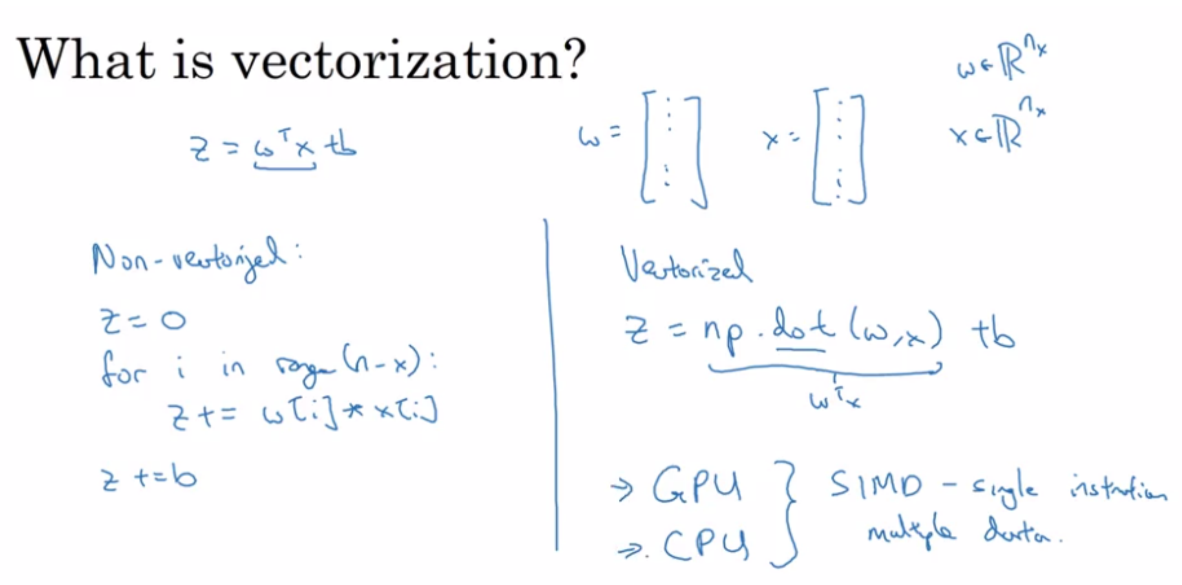
Vectorization



In [1]:
```
import numpy as np
```

In [2]:
```
a = np.random.rand(1000000)
b = np.random.rand(1000000)
```

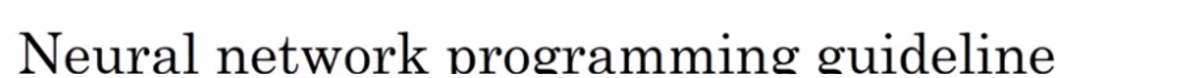
In [3]:
```
%time c = np.dot(a, b)
```

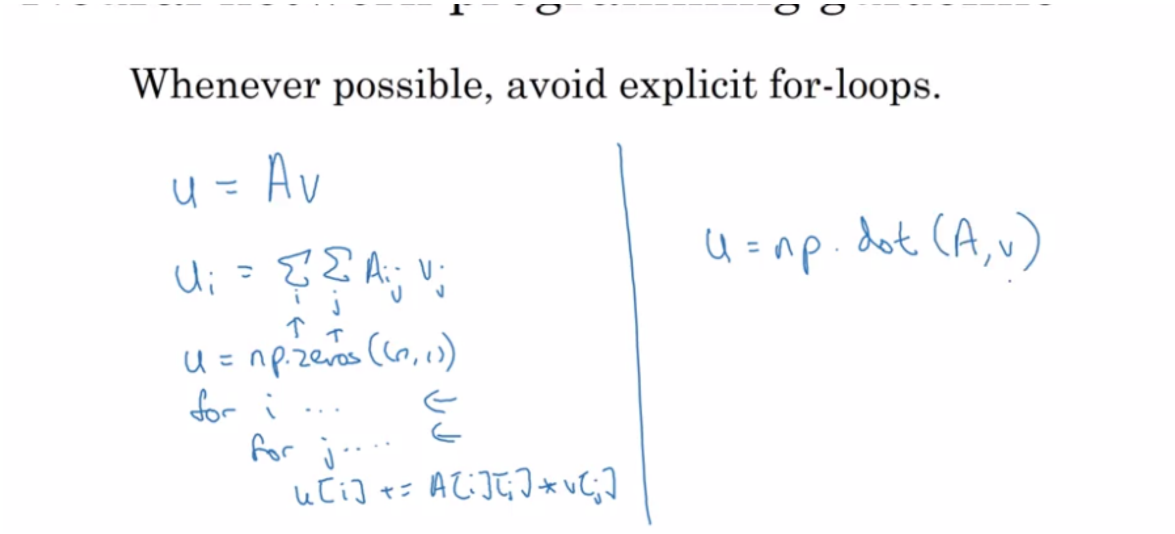
```
CPU times: user 1.62 ms, sys: 727 µs, total: 2.34 ms
Wall time: 1.06 ms
```

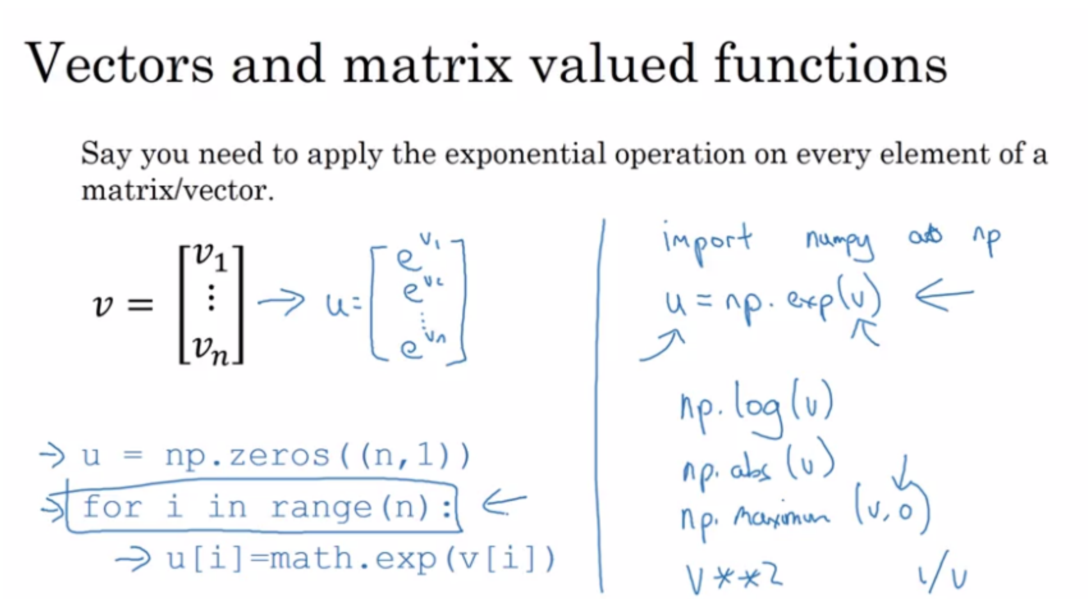
In [4]:
```
def loop():
    c = 0
    for i in range(1000000):
        c += a[i] * b[i]
```

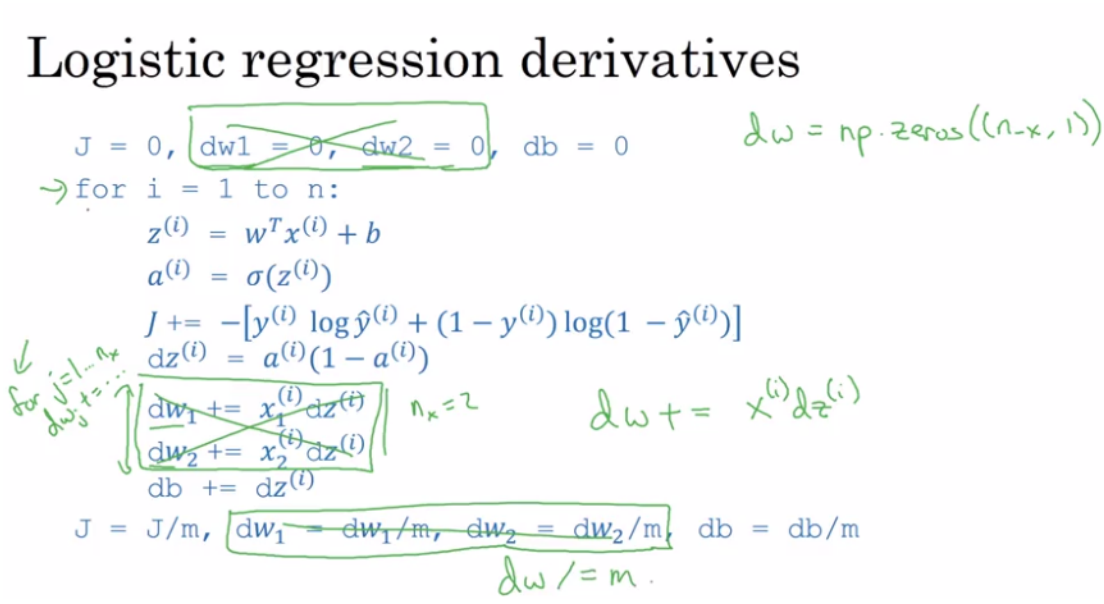
In [5]:
```
%time loop()
```

```
CPU times: user 316 ms, sys: 2.56 ms, total: 319 ms
Wall time: 317 ms
```

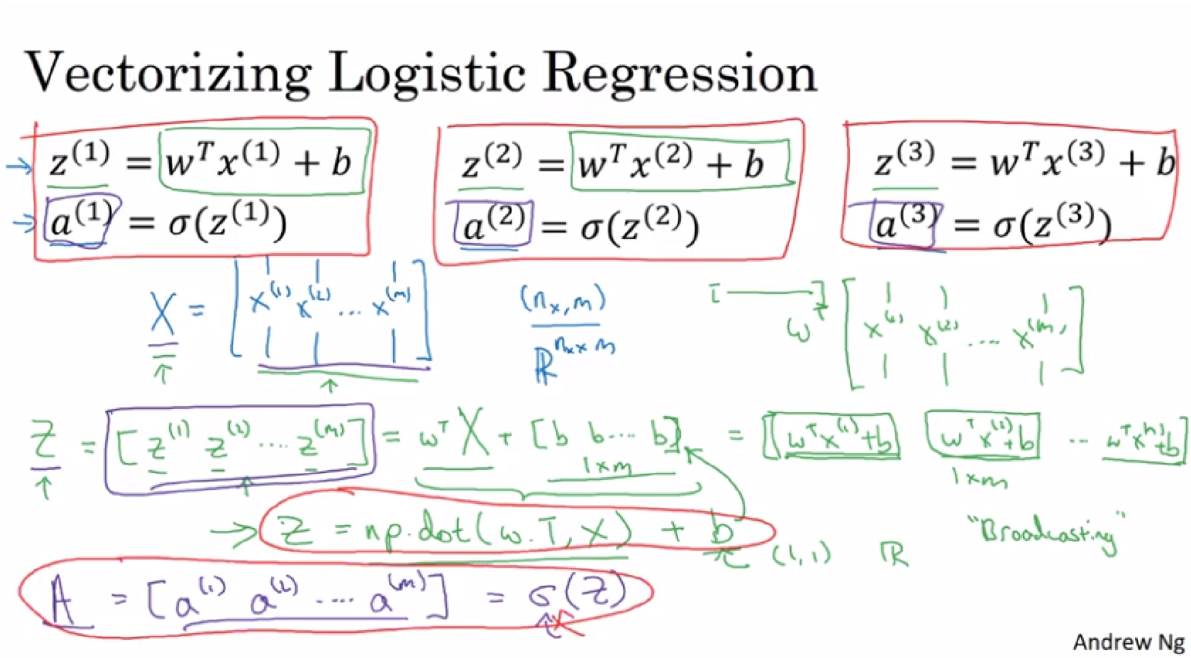




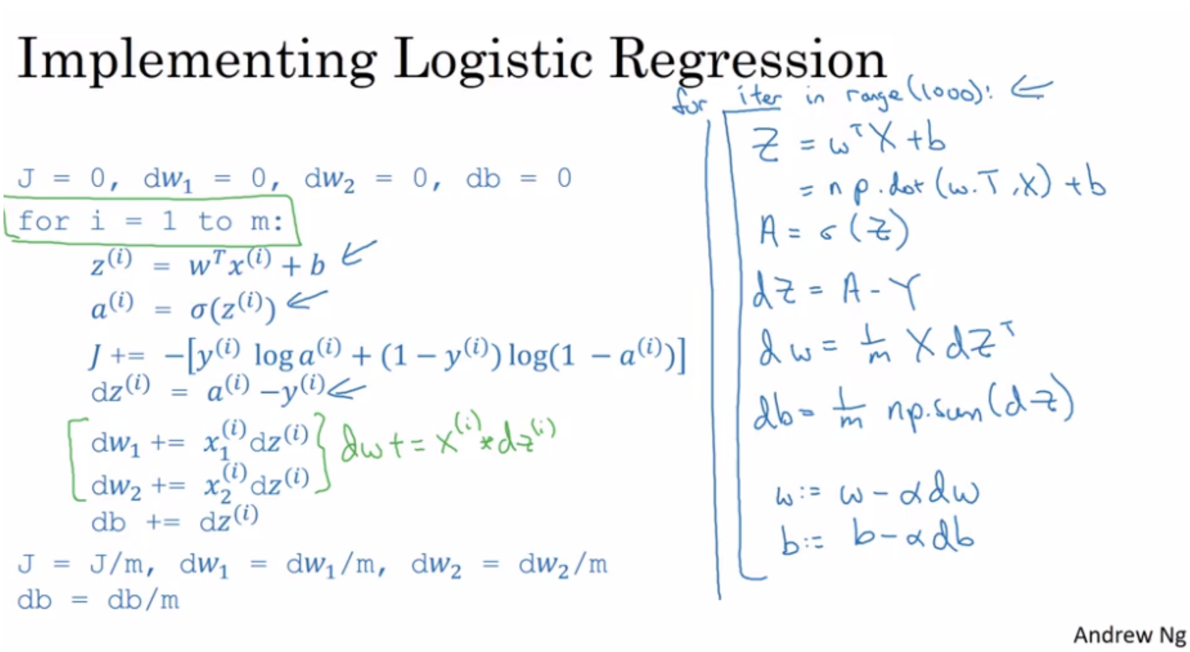




Vectorizing Logistic Regression



Vectorizing Logistic Regression's Gradient Output



A note on python/numpy vectors

In [6]:
```
a = np.random.randn(5)
a
```

Out[6]:
```
array([-0.91796822, -0.53903443,  1.00289266,  0.22272871, -
0.35617949])
```

In [7]:
```
a.shape
```

Out[7]:
```
(5,)
```

In [8]:
```
a.T
```

Out[8]:
```
array([-0.91796822, -0.53903443,  1.00289266,  0.22272871, -
0.35617949])
```

In [9]:
```
np.dot(a, a.T)
```

Out[9]:
```
2.3154893533786054
```

In [10]:
```
a = np.random.randn(5, 1)
a
```

Out[10]:
```
array([[-1.26834861],
       [-0.254855  ],
       [-1.37786229],
       [ 0.18718574],
       [-1.31341244]])
```

In [11]:
```
a.shape
```

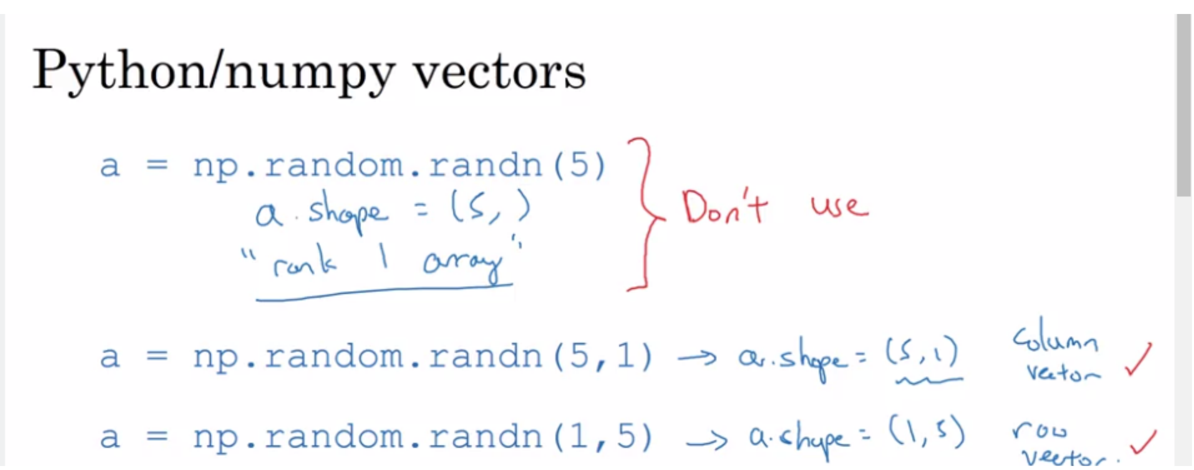
Out[11]:
```
(5, 1)
```

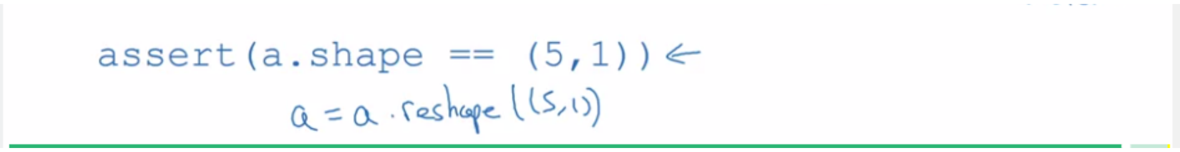
In [12]:
```
a.T
```

Out[12]:
```
array([[-1.26834861, -0.254855  , -1.37786229,  0.18718574,
-1.31341244]])
```

In [13]:
```
np.dot(a, a.T)
```

Out[13]:
```
array([[ 1.60870819,  0.32324498,  1.74760972, -0.23741677,
1.66586484],
       [ 0.32324498,  0.06495107,  0.35115509, -0.04770522,
0.33472972],
       [ 1.74760972,  0.35115509,  1.8985045 , -0.25791618,
1.80970147],
       [-0.23741677, -0.04770522, -0.25791618,  0.0350385 ,
-0.24585208],
       [ 1.66586484,  0.33472972,  1.80970147, -0.24585208,
1.72505223]])
```





In [14]:
```
%load_ext version_information
%version_information numpy
```

Out[14]:

Software	Version
Python	3.6.6 64bit [GCC 4.2.1 Compatible Apple LLVM 6.1.0 (clang-602.0.53)]
IPython	7.0.1
OS	Darwin 17.7.0 x86_64 i386 64bit
numpy	1.15.1
Sun Oct 14 19:41:16 2018 MDT	