

Lecture Notes, Data Science 2017

April 19, 2017

April 18

Gradient Descent, see the [Codes at Github](#)

April 19

Python Syntax

Immutable types: numbers, strings, tuples...

Mutable types: numpy array:

```
# Duplicate for mutable types:
a = b.copy()
# If the elements in b are also pointers, then try:
a = b.deepcopy()
```

Tuple with one element:

```
(7,)
```

List with one element:

```
[7]
```

Dictionary:

```
{ 'name1':7, 'name2':3 }
```

Machine Learning

Training error high? -> Underfitting, bigger model, train longer, change architecture.

Validation error high? -> Overfitting, regularization, smaller model, more data