# Server-Side Languages

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# Welcome to SSL Day 6!

## Interacting with a JSON API

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# Server-Side Languages

## Overview

In this class we will connect to a JSON API and we will create our own JSON service

- Encoding and Decoding JSON
- Reading and Writing JSON
- Reading from a URL

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## What is JSON?

A structured way to encode data.

```
myObject = {
        "first": "John",
        "last": "Doe",
        "age": 39,
        "sex": "M",
        "salary": 70000,
        "registered": true,
        "favorites": {
                "color": "Blue",
                "sport": "Soccer",
                "food": "Spaghetti"
        }
}
```

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## What is decoded JSON?

In PHP, decoded JSON becomes an associative array.

In Python, decoded JSON becomes a dictionary.

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## JSON in PHP

```
json_encode($q
```

```
json_decode($
```

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## PHP - json_encode

```php
$d = array(
    "name" => "Joe",
    "grades" => array(
        "math" => "A",
        "science" => "B"
    )
);
echo json_encode($d);
```

```
{"name":"Joe","grades":{"math":"A","science":"B"}}
```

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## PHP - json_decode

```php
$j = '{"name":"Joe","grades":{"math":"A","science":"B"}}';

var_dump(json_decode($j));
```

```
object(stdClass)#1 (2) {
  ["name"]=>
  string(3) "Joe"
  ["grades"]=>
  object(stdClass)#2 (2) {
    ["math"]=>
    string(1) "A"
    ["science"]=>
    string(1) "B"
  }
}
```

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## PHP - json_decode

Drilling down and the missing entry error

```php
$j = '{"name":"Joe","grades":{"math":"A","science":"B"}}';

$o = json_decode($j);

echo $o->name . " got an " . $o->grades->math . " in math.\n";

echo "This doesn't exist: " . $o->nothing;
```

```
Joe got an A in math.
PHP Notice:  Undefined property: stdClass::$nothing in /Users/tbsmith/
Sites/test2.php on line 9
This doesn't exist:
```

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## JSON in Python

```
import json
```

```
json.loads(
```

```
json.dumps(
```

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## Python - json.dumps

```
>>> import json
>>> info = {'name':'Joe',
... 'grades':{
...       'math':'A',
...       'science':'B'
... }}
>>> json.dumps(info)
'{"grades": {"science": "B", "math": "A"}, "name": "Joe"}'
```

The syntax of a python dictionary is exactly the same as that of a JSON object.

In this example, a dictionary called ‘info’ is made and converted into a JSON string.

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## Python - json.loads

Drilling down and the missing entry error

```
>>> import json
>>> info_string = '{"name":"lamp","price":{"retail":9.99,"sale":5.99}}'
>>> info = json.loads(info_string)
>>> info['name']
u'lamp'
>>> info['price']['regular']
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
KeyError: 'regular'
>>> info['price']['retail']
9.99
```

JSON objects can be embedded in other JSON objects.

A KeyError is given when you ask for a non-existent key in a dictionary.

"Drill down" into a dictionary using sequential square brackets.

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## In-class Assessment

Try out the coding functions in both languages.

- Make an associative array with at least one embedded associative array.

- Print it out to the browser.

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## Reading from a URL in PHP

```
file_get_contents($url)
```

This functions returns a string with the contents as you would see if you viewed the source of the website.

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## Reading from a URL in Python

```
import urllib2


response = urllib2.urlopen("http://www.cnn.com")

print "Content-type: text/html\n\n"

print response.read()
```

http://docs.python.org/2/library/urllib2.html

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## In-class Assessment

- Make the CNN script use a different website with a more complicated URL. Pass parameter values to the URL string with your code.

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## Choose a public JSON API

Find a free JSON API that interests you.

programmableweb.com

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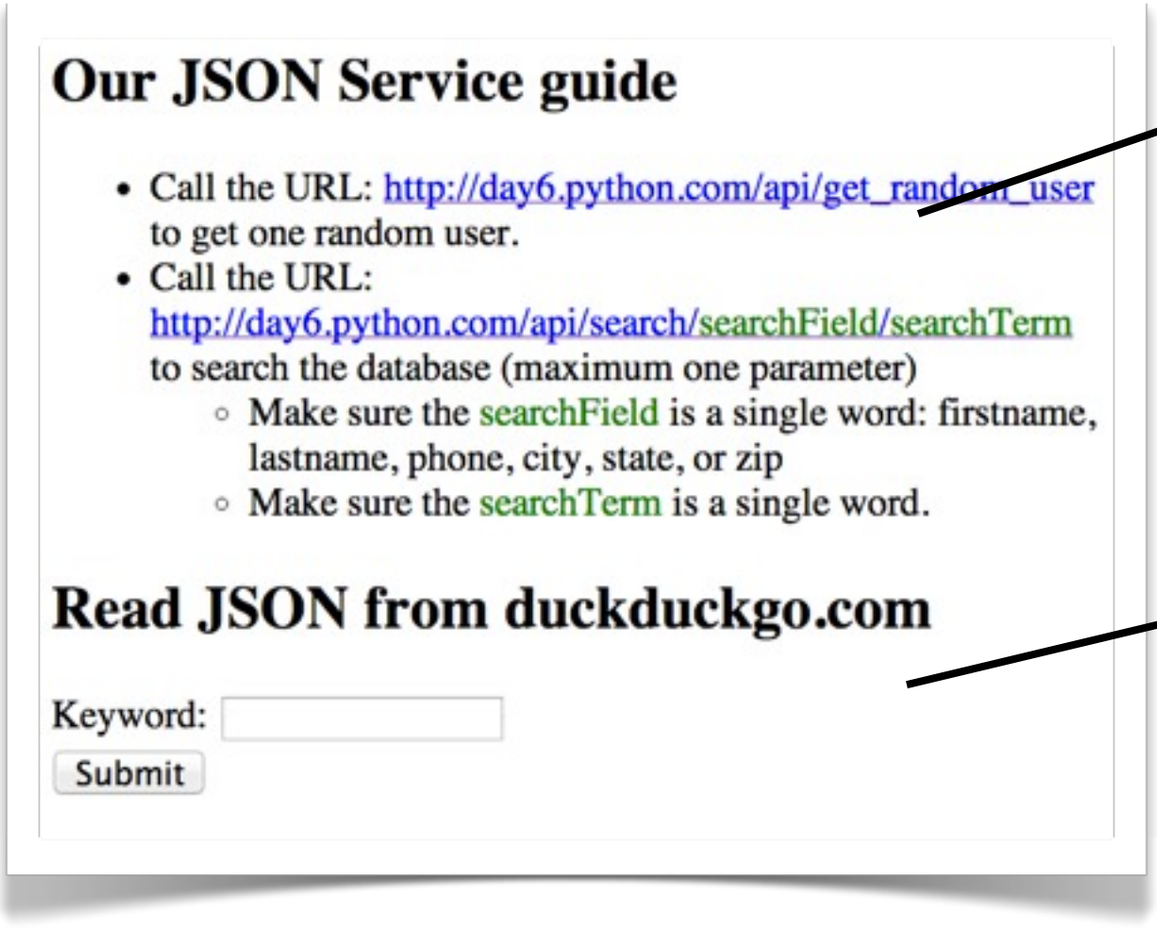
## In-class assignment: Replicate this functionality in both languages



**Our JSON Service guide**

- Call the URL: http://day6.python.com/api/get_random_user to get one random user.
- Call the URL: http://day6.python.com/api/search/searchField/searchTerm to search the database (maximum one parameter)
  - Make sure the searchField is a single word: firstname, lastname, phone, city, state, or zip
  - Make sure the searchTerm is a single word.

**Read JSON from duckduckgo.com**

Keyword:

Submit

This will search your example database and return results in JSON form

This will get results from the API of your choice in JSON form and decode them into styled HTML

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## Lab 7

To each of your websites, add one of these:

**JSON Service -** will respond to HTTP requests by getting information from your database and encoding it with JSON

**JSON Reader -** will decode JSON from someone else's service and display it and insert it into your database

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