Server-Side Languages

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Welcome to SSL Day 6!

Interacting with a JSON API

Day 6

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Overview

In this class we will build a connection to a JSON API.

Day 6

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"
        }
}
```

Day 6

3

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What is decoded JSON?

In PHP, decoded JSON becomes an associative array.

In Python, decoded JSON becomes a dictionary.

Day 6

4

JSON in PHP

Day 6

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PHP - json_encode

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

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

Day 6

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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"
  }
}
```

Day 6

7

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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:
```

Day 6

JSON in Python

```
import json
```

```
json.loads(
```

```
json.dumps(
```

Day 6

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.

Day 6

10

Python - json.loads

Drilling down and the missing entry error

JSON objects can be embedded in other JSON objects.

```
>>> 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
```

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

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

Day 6

11

Reading from a URL in PHP

```php
function duck($text='default') {

    $url = "http://api.duckduckgo.com/?q="
        . urlencode($text)
        . "&format=json&pretty=1";

    $contents = file_get_contents($url);

    $data = json_decode($contents);

    echo "<pre>";
    var_dump($data);
    echo "</pre>";
}
```
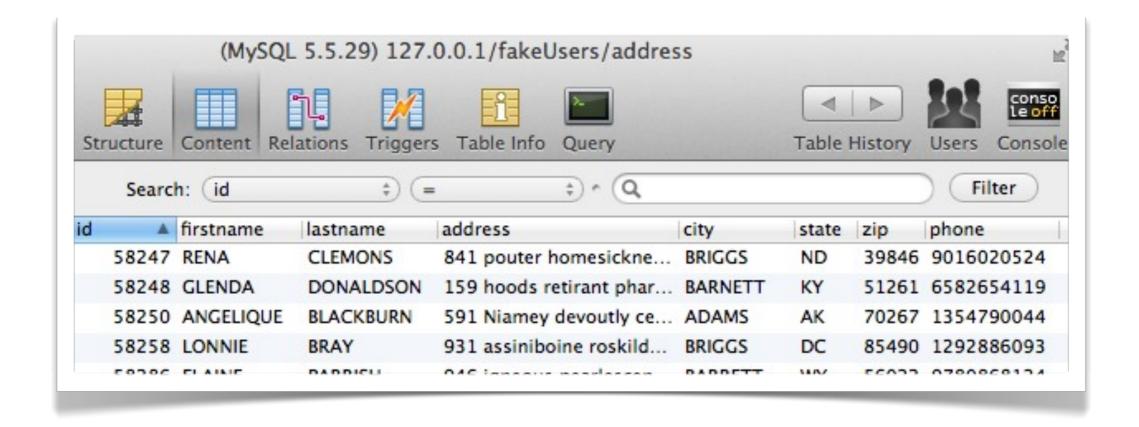
Day 6

12

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Reading from a URL in Python

```
import urllib2
```

```python
def search(self, query="default"):
    response = urllib2.urlopen(
        "http://api.duckduckgo.com/?q="
        + str(query) + "&format=json&pretty=1")
    JSONstring = response.read()
    JSONobject = json.loads(JSONstring)
    return JSONobject
```

Day 6

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Make an example database

Day 6

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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 Duck Duck Go API in JSON form and decode them in plaintext

Day 6

16

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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 download information from someone else's JSON service and display it and insert it into your database

Day 6