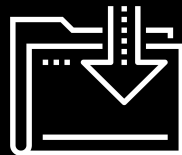# Rendering Your Data With Flask

Data Boot Camp
Lesson 12.3

WELCOME

Class Objectives

By the end of today's class you will be able to:

Use Beautiful Soup to scrape data.

Use PyMongo to save that data to a Mongo database.

Render templates with Flask using data retrieved from Mongo database.
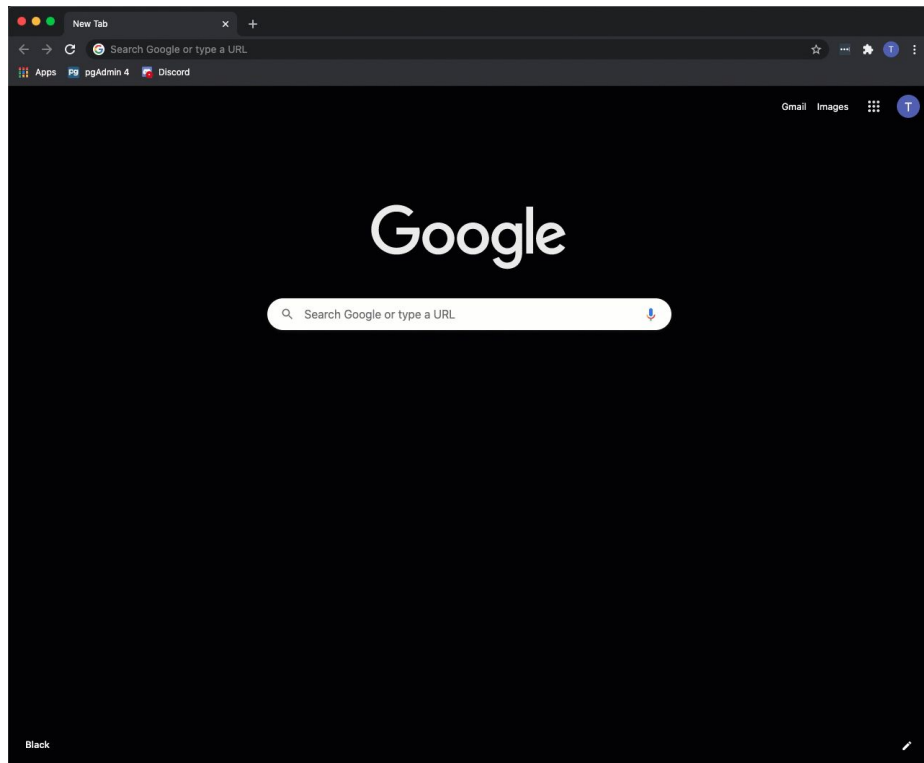
Instructor Demonstration
Intro to Flask Render

Intro to Flask Render

How it works - The basics of rendering a template with Flask!

1. In your CLI navigate to the appropriate folder.
2. Run: `python app.py`
3. Open your browser and visit

Intro to Flask Render

```
/app.py
/templates
    /index.html
```

```python
1  # import necessary libraries
2  from flask import Flask, render_template
3
4  # create instance of Flask app
5  app = Flask(__name__)
6
7
8  # create route that renders index.html template
9  @app.route("/")
10 def echo():
11     return render_template("index.html", text="Serving up cool text from the Flask server!!")
12
13
14 if __name__ == "__main__":
15     app.run(debug=True)
```

```html
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <meta http-equiv="X-UA-Compatible" content="ie=edge">
  <title>Templates 101</title>
  <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css">
</head>

<body>
  <div class="container">

    <div class="jumbotron text-center">
      <!-- Render our data -->
      <h1>{{ text }}</h1>
    </div>

  </div>
</body>

</html>
```

Activity: Rendering A String With Flask

In this activity, you will create a webpage rendering a string with Flask.

Activity: Rendering A String With Flask

- Create a webpage that will return a welcome message with a name returned from your flask app.
- Add a paragraph underneath to display a hobby of your own; this will also be returned from the back end.
- Create a link to a bonus page that routes you to an entirely new static html page and also returns both your name and hobby from the back end.
- **Bonus**:
  - Add a link back to the home page in your bonus page.
- **Hint:**
  - Consult the Flask Render Docs for reference.

Time's Up! Let's Review.

Instructor Demonstration
Rendering a List

Rendering a List

```
/app.py
/templates
    /index.html
```

```python
1   # import necessary libraries
2   from flask import Flask, render_template
3
4   # create instance of Flask app
5   app = Flask(__name__)
6
7
8   # create route that renders index.html template
9   @app.route("/")
10  def index():
11      team_list = ["Jumpers", "Dunkers", "Dribblers", "Passers"]
12      return render_template("index.html", list=team_list)
13
14
15  if __name__ == "__main__":
16      app.run(debug=True)
```

```html
1   <!DOCTYPE html>
2   <html lang="en">
3
4   <head>
5     <meta charset="UTF-8">
6     <meta name="viewport" content="width=device-width, initial-scale=1.0">
7     <meta http-equiv="X-UA-Compatible" content="ie=edge">
8     <title>Teams!</title>
9     <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css">
10  </head>
11
12  <body>
13    <div class="container text-center">
14      <h1 class="jumbotron">Team Rosters</h1>
15      <div>
16        <ul style="list-style: none;">
17
18          {% for name in list %}
19          <li>{{ name }}</li>
20          {% endfor %}
21
22        </ul>
23      </div>
24    </div>
25  </body>
26
27  </html>
```

```
{% for name in list %}
  <li>{{ name }}</li>
{% endfor %}
```

Activity: Rendering A List

In this activity, you will create a web page rendering a list with Flask.

Activity: Rendering A List

- Create a web page that will display a list of your top five favorite movies.
- Add style to your webpage by using bootstrap cards, add whatever info you like.

Time's Up! Let's Review.

Instructor Demonstration
Rendering a Dictionary

Rendering a Dictionary

```
/app.py
/templates
    /index.html
```

```python
1   # import necessary libraries
2   from flask import Flask, render_template
3
4   # create instance of Flask app
5   app = Flask(__name__)
6
7
8   # create route that renders index.html template
9   @app.route("/")
10  def index():
11      player_dictionary = {"player_1": "Jessica",
12                           "player_2": "Mark"}
13      return render_template("index.html", dict=player_dictionary)
14
15
16  if __name__ == "__main__":
17      app.run(debug=True)
```

```html
1   <!DOCTYPE html>
2   <html lang="en">
3
4   <head>
5     <meta charset="UTF-8">
6     <meta name="viewport" content="width=device-width, initial-scale=1.0">
7     <meta http-equiv="X-UA-Compatible" content="ie=edge">
8     <title>Sports!</title>
9     <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css">
10  </head>
11
12  <body>
13    <div class="container text-center">
14      <h1 class="jumbotron">Player Roster</h1>
15      <div>
16        <ul style="list-style: none;">
17          <li>{{ dict.player_1 }}</li>
18          <li>{{ dict.player_2 }}</li>
19        </ul>
20      </div>
21    </div>
22  </body>
23
24  </html>
```

```html
<ul style="list-style: none;">
    <li>{{ dict.player_1 }}</li>
    <li>{{ dict.player_2 }}</li>
</ul>
```

Activity: Rendering a Dictionary

In this activity, you will create a web page rendering a dictionary with Flask.

Suggested Time:
10 Minutes

Activity: Rendering a Dictionary

- Create a list of dictionaries that include the name and type of animal.
- Loop through the list and display an unordered list on the webpage.
- Each line should include the name of the animal and type.
- Add some CSS styling to each list item.

Time's Up! Let's Review.

Countdown timer
40:00
(with alarm)

Instructor Demonstration

Rendering Data from MongoDB

Rendering Data from MongoDB

```
/app.py
/templates
    /index.html
```

- **Pymongo is imported and a Flask app is created.**
- **A connection is set up to the Mongo client.**
- **Connect to a database called `team_db` if the database is not already available one will be created.**
- **Here, the collection is dropped to avoid the data inserting and duplicating every time the server is reset.**
- The collection will be remade each time and the documents are inserted into the collection.

```python
from flask import Flask, render_template

# Import our pymongo library, which lets us connect our Flask app to our Mongo database.
import pymongo

# Create an instance of our Flask app.
app = Flask(__name__)

# Create connection variable
conn = 'mongodb://localhost:27017'

# Pass connection to the pymongo instance.
client = pymongo.MongoClient(conn)

# Connect to a database. Will create one if not already available.
db = client.team_db

# Drops collection if available to remove duplicates
db.team.drop()

# Creates a collection in the database and inserts two documents
db.team.insert_many(
    [
        {
            'player': 'Jessica',
            'position': 'Point Guard'
        },
        {
            'player': 'Mark',
            'position': 'Center'
        }
    ]
)

# Set route
@app.route('/')
def index():
    # Store the entire team collection in a list
    teams = list(db.team.find())
    print(teams)

    # Return the template with the teams list passed in
    return render_template('index.html', teams=teams)


if __name__ == "__main__":
    app.run(debug=True)
```

Activity: Rendering Data from MongoDB

In this activity, you will set a connection to the Mongo Client and render data from MongoDB

Activity: Rendering A String With Flask

- Create a file called `insert_data.py` and setup a connection to mongo using PyMongo.
- Next, insert at least five store items that each include, type, cost, and stock into a mongo databases and collection.
- Run the file (Why would we not want this in the app.py file?).
- Setup a Flask app that makes a connection to the database and collection you created.
- Return to a list of all the full inventory.
- Display the type of item and cost of the item on the webpage.

- **Bonus:**
  - Display cost for each item by (cost * stock).
- **Hints:**
  - Use bootstrap cards to clean up the look.

Time's Up! Let's Review.

Instructor Demonstration

Scrape, Save and Render Data

Scrape, Save and Render Data

```
/app.py
/scrape_phone.py
/templates
    /index.html
```

```html
1   <!DOCTYPE html>
2   <html lang="en">
3
4   <head>
5     <meta charset="UTF-8">
6     <meta name="viewport" content="width=device-width, initial-scale=1.0">
7     <meta http-equiv="X-UA-Compatible" content="ie=edge">
8     <title>Find a Phone</title>
9     <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/boo
10  </head>
11
12  <body>
13    <div class="container">
14
15      <div class="jumbotron text-center">
16        <h1>Phone Shoppin'</h1>
17        <p><a class="btn btn-primary btn-lg" href="/scrape" role="button">Find a phone!<
18      </div>
19
20      <!-- Craigslist Listings -->
21      <div class="row" id="craiglist-listings">
22        <div class="col-md-12">
23          <h4 class="heading">{{listings.price}} {{listings.headline}}</h4>
24          <small>{{listings.reviews}}</small>
25        </div>     Ahmed Haque [3 years, 5 months ago] • Added read all sqls
26      </div>
27
28    </div>
29  </body>
30
31  </html>
```

scrape_phone.py > …
```python
1   from splinter import Browser
2   from bs4 import BeautifulSoup
3
4
5   def init_browser():
6       # @NOTE: Replace the path with your actual path to the chromedriver
7       executable_path = {"executable_path": "/usr/local/bin/chromedriver"}
8       return Browser("chrome", **executable_path, headless=False)
9
10
11  def scrape():
12      browser = init_browser()
13      listings = {}
14
15      url = "https://webscraper.io/test-sites/e-commerce/allinone/phones/touch"
16      browser.visit(url)
17
18      html = browser.html
19      soup = BeautifulSoup(html, "html.parser")
20
21      listings["headline"] = soup.find("a", class_="title").get_text()
22      listings["price"] = soup.find("h4", class_="price").get_text()
23      listings["reviews"] = soup.find("p", class_="pull-right").get_text()
24
25      return listings
```

app.py > …
```python
1   from flask import Flask, render_template, redirect
2   from flask_pymongo import PyMongo
3   import scrape_phone
4
5   app = Flask(__name__)
6
7   # Use flask_pymongo to set up mongo connection
8   app.config["MONGO_URI"] = "mongodb://localhost:27017/phone_app"
9   mongo = PyMongo(app)
10
11  # Or set inline
12  # mongo = PyMongo(app, uri="mongodb://localhost:27017/phone_app")
13
14
15  @app.route("/")
16  def index():
17      listings = mongo.db.listings.find_one()
18      return render_template("index.html", listings=listings)
19
20
21  @app.route("/scrape")
22  def scraper():
23      listings = mongo.db.listings
24      listings_data = scrape_phone.scrape()
25      listings.update({}, listings_data, upsert=True)
26      return redirect("/", code=302)
27
28
29  if __name__ == "__main__":
30      app.run(debug=True)
```

New library!

There is a library to provide some handy helpers to integrate Flask and PyMongo.

```
pip install Flask-PyMongo
```

Activity: Scrape and Render

In this activity, you will scrape data into a mongo database and then use that data to build a new webpage.

Suggested Time:
35 Minutes

Activity: Scrape and Render

- Complete the code in `scrape_costa.py` to scrape typical min and max temperatures from the Costa Rica Vacation Page. The `scrape_info` function should return the typical min and max temperatures as a Python Dictionary.
- In `app.py`, complete the `/scrape` route to store the Python dictionary as a document in a mongo database collection.
- In `app.py`, complete the `/` route to read one entry from mongo and render the flask template with the mongo data.

- **Bonus:**
    - If time remains, try to scrape the image source from the Vacation page. Note that this will require building a path that consists of the website url and the relative image path.
    - Web scraping often includes data from multiple sources. Try and incorporate data from a secondary webpage into your scraper.

Time's Up! Let's Review.