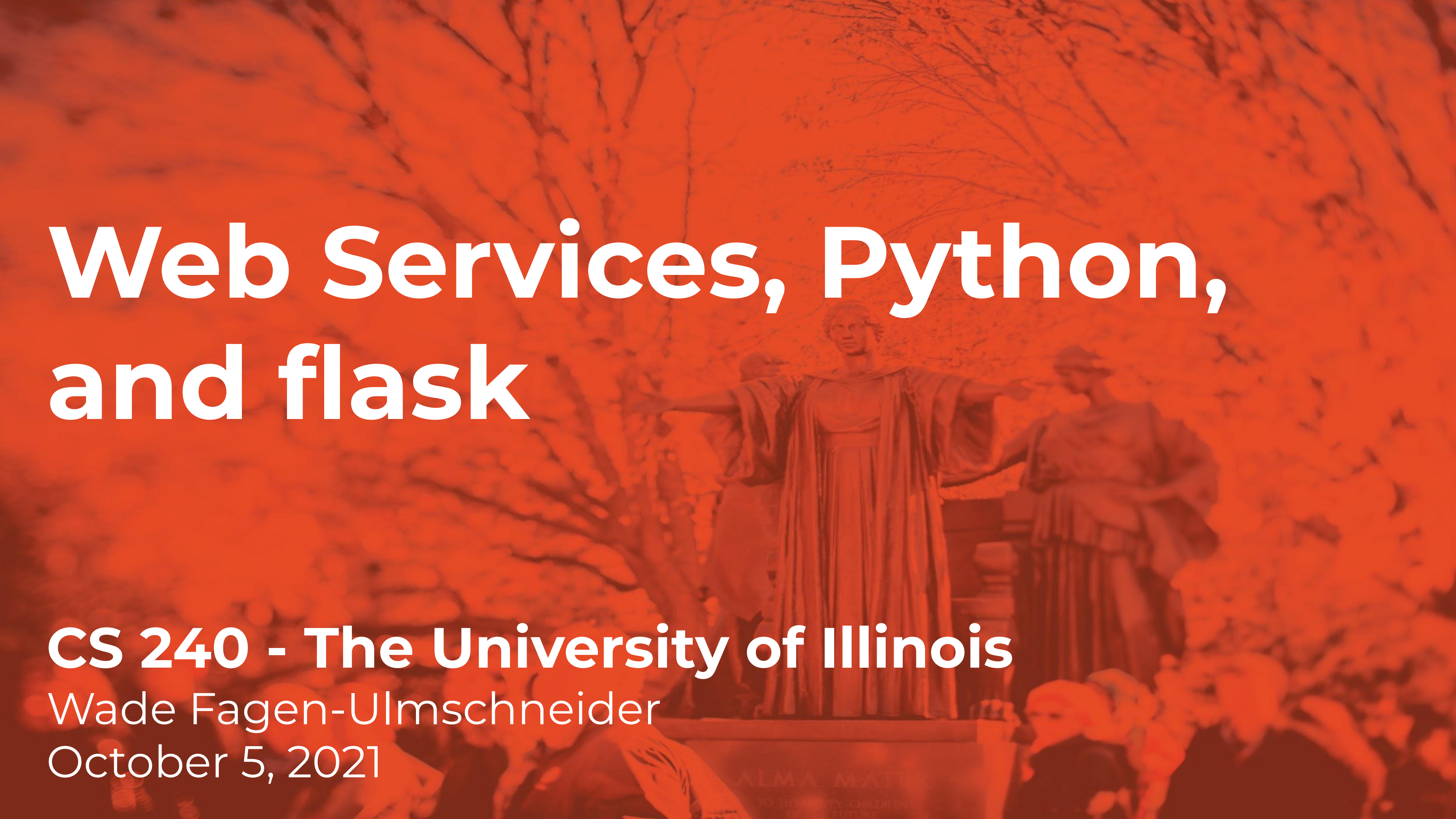


# Web Services, Python, and flask

## CS 240 - The University of Illinois

Wade Fagen-Ulmschneider

October 5, 2021

# Web Services

# [1]:

```
GET /cs240/fa2021/ HTTP/1.1\r\n
Host: courses.grainger.illinois.edu\r\n
...
```

# [2]:

# [2]: RESTful Web Services

National Weather Service API:

```
https://api.weather.gov/points/{latitude},{longitude}
```

Location of 2215 CIF:

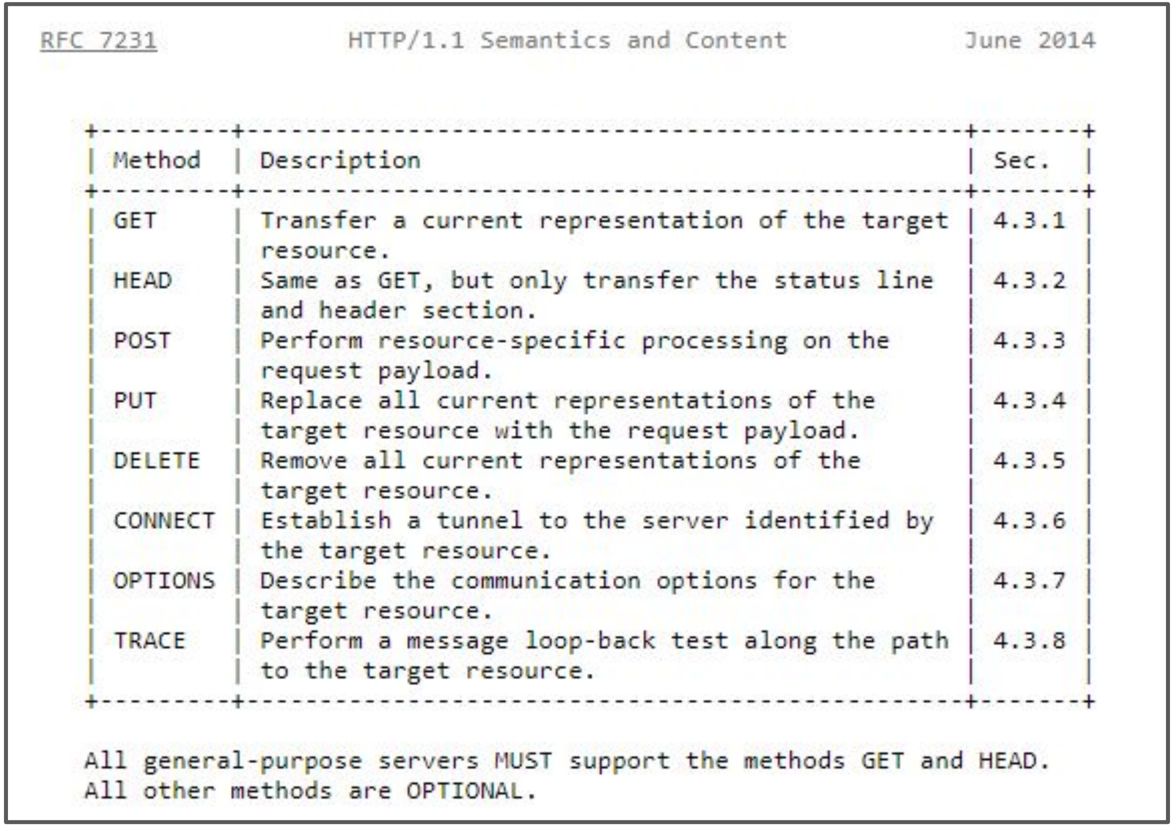
```
GET /points/                HTTP/1.1\r\n
Host: api.weather.gov\r\n
...
```

# [3]:

```
POST /q/api/queues/788/staff/1 HTTP/1.1\r\n
Host: queue.illinois.edu\r\n
Content-Length: 477\r\n

...
{ "id": 30540, "startTime": "2021-10-05T15:48:57.000Z", "endTime": null,
"createdAt": "2021-10-05T15:48:57.000Z", "updatedAt":
"2021-10-05T15:48:57.000Z", "userId": 1, "queueId": 788, "user": { "name":
"Wade A Fagen-Ulmschneider", "id": 1, "netid": "waf", "universityName": "Wade
A Fagen-Ulmschneider", "preferredName": null, "isAdmin": true, "createdAt":
"2018-02-14T05:27:54.000Z", "updatedAt": "2018-02-21T05:34:33.000Z" } }
```

# HTTP Action Verbs



RFC 7231 HTTP/1.1 Semantics and Content June 2014

| Method | Description | Sec. |
|---|---|---|
| GET | Transfer a current representation of the target resource. | 4.3.1 |
| HEAD | Same as GET, but only transfer the status line and header section. | 4.3.2 |
| POST | Perform resource-specific processing on the request payload. | 4.3.3 |
| PUT | Replace all current representations of the target resource with the request payload. | 4.3.4 |
| DELETE | Remove all current representations of the target resource. | 4.3.5 |
| CONNECT | Establish a tunnel to the server identified by the target resource. | 4.3.6 |
| OPTIONS | Describe the communication options for the target resource. | 4.3.7 |
| TRACE | Perform a message loop-back test along the path to the target resource. | 4.3.8 |

All general-purpose servers MUST support the methods GET and HEAD. All other methods are OPTIONAL.

RFC 7231, Section 4

- **GET**: Requests a representation of the specified resource. Requests using GET should only retrieve data.

- **POST**: Submits an entity to the specified resource, often causing a change in state or side effects on the server.

- **HEAD**: Asks for a response identical to a GET request, but without the response body.

- **PUT**: Replaces all current representations of the target resource with the request payload.

- **DELETE**: Deletes the specified resource.

- **PATCH**: Applies partial modifications to a resource.

- **`CONNECT`**: Establishes a tunnel to the server identified by the target resource.

- **`OPTIONS`**: Describes the communication options for the target resource.

- **`TRACE`**: Performs a message loop-back test along the path to the target resource.

# Python Programming

# Python

Python is an “**interpreted**” programming language:

# Python

Python is a “**dynamically typed**” programming language:

# Python

Python’s control-flow is **whitespace delimited**:

# Python

Python places heavy emphasis on **code readability**:

# 12/hello.py

```
s1 = "Hello”
s2 = “ World”

for i in range(10):
  if i < 5:
    print(s1)
  elif i < 8:
    print(s1 + s2)
  else:
    print(s2)
```

# 12/app.py

```python
from flask import Flask
app = Flask(__name__)

# Route for "/" for a web-based interface to this micro-service:
@app.route('/')
def index():
  from flask import render_template
  return render_template("index.html")

# Extract a hidden "uiuc" GIF from a PNG image:
@app.route('/extract', methods=["POST"])
def extract_hidden_gif():
  # ...
```

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