

A close-up photograph of a sesame seed bun, likely from a burger or sandwich. The bun is golden-brown and covered in white sesame seeds. It is set against a background of a light-colored, textured surface (possibly a tablecloth) and a dark orange-red surface. The text "So You Want To Build An API?" is overlaid in white, bold, sans-serif font, centered on the bun.

So You Want To
Build An API?

I'M MEGAN

findme@meganspeir.com



Welcome To PyCon.
Home Of Python.
May I Show You
Something?

So, You Want To
Build An API?



Maybe A Web API...
for Good Burger

We are going to look
at the best practices of
designing a web API
and the patterns in
Flask we may use to
get there.

Actually, Let's
Design Two APIs



But First...

Where Do Best Practices Come From?

Because that's what we need for the web API.

“Ultimately it comes down to taste. It comes down to trying to expose yourself, to the best things that humans have done. And then try to bring those things in to what you're doing.”

—Steven P. Jobs

And Where Do Patterns Come From?

Because that's what we need for the Flask.

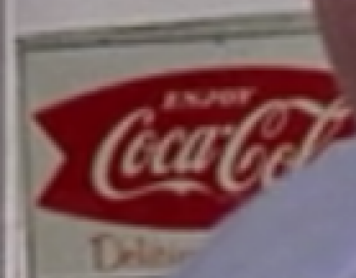
Lazy Developers Who Are Smarter Than You

Look to your left... Look to your right...

Choose Your Flavor

And your tools.

GOOD BURGER -	\$ 1.49
DOUBLE GOOD BURGER	1.89
TRIPLE GOOD BURGER	2.29
GOOD CHUNKS	2.69
GOOD CHICKWICH	2.49
GOOD WEENIE	DISCONTINUED
GOOD TACO	1.09
GOOD CHILI	.99
GOOD S	79 & .99
GOOD RAGE	79 & .89 & .99
GOOD	1.09 & 1.49
GOOD	1.09
GOOD	.79
GOOD	.49 .89 .89
GOOD	.49



Design All The Documents

Then write all the code.



A man wearing a white chef's hat with a blue band and a blue and white striped shirt. He has a surprised or perhaps slightly annoyed expression on his face, with wide eyes and a slightly open mouth. He is looking directly at the camera. The background is a plain, light-colored wall. In the foreground, there is a white tray and a red plastic basket, suggesting a kitchen or food service setting.

But Wait.... What's A Web API?

I was hoping you wouldn't ask. I'm hungry already.

In short. It is an API that conforms to REST design principles. Being defined by a resource that acts upon a representation through HTTP verbs.

Defining The Resource

A conceptual mapping to a set of entities, not the entity that corresponds to the mapping at any particular point in time.

Designing An Identifier

The partial or complete identifier to the particular resource involved in an interaction between components.
(URI) We will call these endpoints.

`/goodburger.com`

Use Your Words

nouns - plurals - not abstract

/goodburger.com/burgers



Route Decorators

```
@app.route('/burgers/', methods=['GET'])
```

```
@app.route('/burgers/<int:burger_id>', methods=['GET'])
```

Method Views

```
burgers_view = UserAPI.as_view('burgers_api')
app.add_url_rule('/burgers/',
                 defaults={'burger_id': None},
                 view_func=burgers_view,
                 methods=['GET',])
app.add_url_rule('/burgers/<int:burger_id>',
                 view_func=burgers_view,
                 methods=['GET'])
```

REStyle

```
@resource.identifier('/burgers/<int:burger_id>')
```

And A Subdomain

api - graph - search - stream

/api.goodburger.com/burgers

Version

no dots - no date - major only

/api.goodburger.com/v1/burgers

Hard Code

```
@app.route('/v1/burgers/', methods=['GET'])
```

```
@app.route('/v1/burgers/<int:burger_id>', methods=['GET'])
```


Blueprints

```
app.register_blueprint(burgers.resource, url_prefix='/v1')
```

All The Good Burgers

[/api.goodburger.com/v1/burgers](https://api.goodburger.com/v1/burgers)



Designing A Representation

A sequence of bytes, plus representation
metadata to describe those bytes.

Again, Use Your Words

```
{  
  "burger_name": "Double-Double",  
  "ingredients": {  
    "bun": "sesame",  
    "patty_number": "2",  
    "sauce": "secret"  
  }  
}
```



Design A Schema

```
public_schema = {  
    'burger_name': types.String(attribute='code_name'),  
    'ingredients': {  
        'condiments': types.String(attribute='toppings'),  
        'patty_number': types.Integer()  
    }  
}
```

```
private_schema = {  
    'burger_name': types.String(attribute='code_name'),  
    'ingredients': {  
        'bun': types.String(default='sesame'),  
        'patty_number': types.Integer(),  
        'sauce': types.String()  
    }  
}
```

Errors For HumansTM

Really?

```
{  
  "status": "500",  
  "message": "Bailing out, sorry dude!"  
}
```

```
{  
  "status": "501",  
  "message": "WTF just happened?"  
}
```





I'M SPATCH

For Spatch

```
{  
  "status": "500",  
  "message": "Verbose message here."  
}  
  
{  
  "status": "501",  
  "message": "ALL the information I need."  
}
```

Metadata

Tell me about yourself.

Formats

Use JSON.

Content-Type: application/json; charset=utf-8

Relationships

Maybe you'd like my friend.

Control Data

All your requests belong to us.

Headers

It's all in your head.

A man in a striped shirt and white cap is seasoning french fries in a fast-food kitchen. He is using a metal shaker to sprinkle seasoning over a large pile of fries. The kitchen has two large white heat lamps hanging over the counter. In the background, there is a sign of a hamburger. The entire image has a blue tint.

What You May Want.
But maybe not what you'll need.

Borrow A Data Structure

```
from werkzeug.datastructures import Headers
```

```
headers = Headers()
```

```
headers.add('Server', 'Burger Server')
```

```
headers.add('Strict-Transport-Security', 'max-age=31536000')
```

```
headers.add('X-XSS-Protection', '1; mode=block')
```

```
headers.add('X-Content-Type-Options', 'nosniff')
```

```
headers.add('X-Frame-Options', 'deny')
```

```
response.headers.extend(headers)
```

Cache-Control

Refrigerate after opening.



Rate limiting

Because even if Humans don't love you, robots will.

```
X-RateLimit-Limit: 60  
X-RateLimit-Remaining: 34  
X-RateLimit-Reset: 1397284381
```

Authentication

Makes my Heartbleed.

TRY OUR NEW
ED'S
SAUCE!



Parting Thoughts

Thank You.

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Images courtesy of Good Burger (1997). Watch the movie.