Application Programming Interfaces (APIs)
Code-Along

Ryan Day (IC)

10/20/2017

Agenda

- 1:00 - 1:45
  - Understanding APIs
  - Browsing and viewing REST APIs
  - Tools for using APIs
- 1:45 - 1:50
  - Break
- 1:50 - 2:30
  - Coding with APIs

Introductions

Lab 1

View an API in the browser

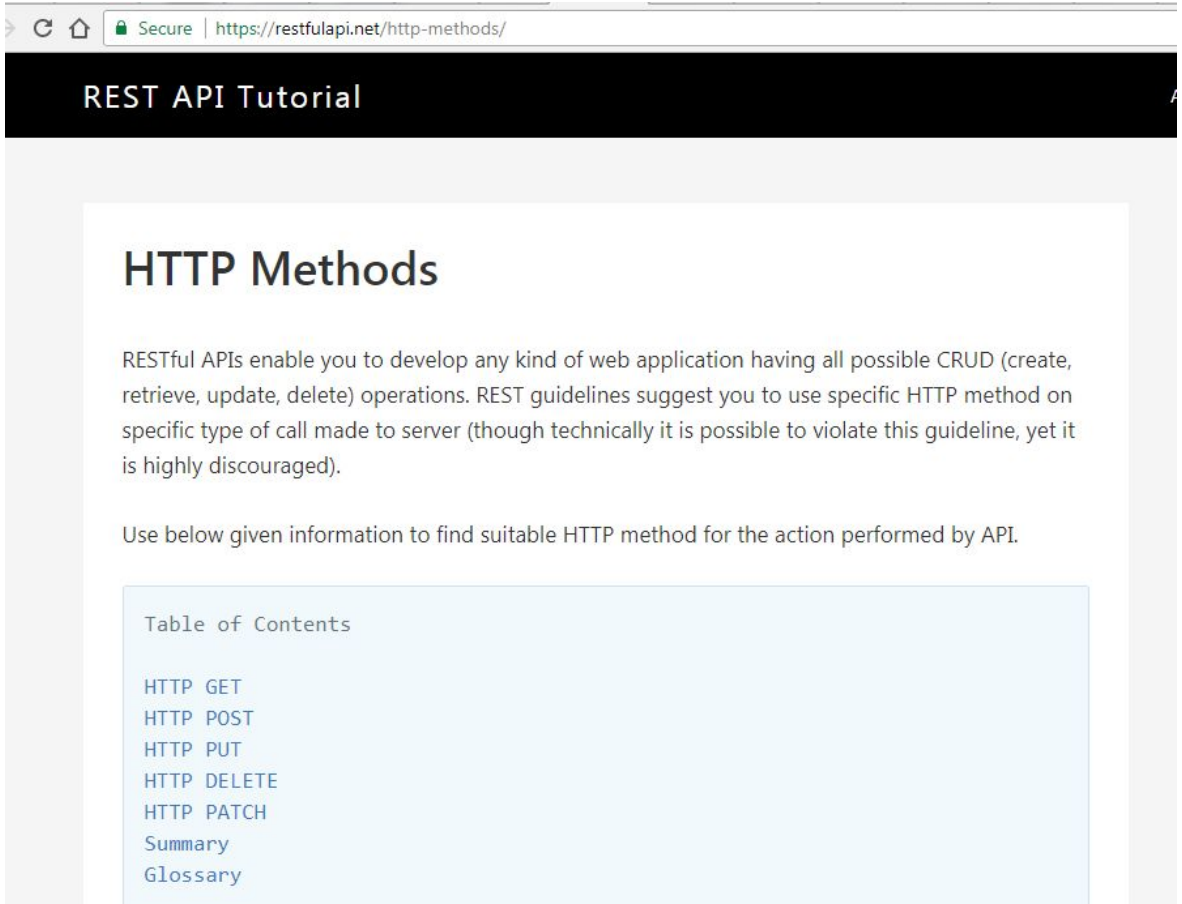
API/Web Service Styles: SOAP vs. REST

#	SOAP	REST
1	A XML-based message protocol	An architectural style protocol
2	Uses WSDL for communication between consumer and provider	Uses XML or JSON to send and receive data
3	Invokes services by calling RPC method	Simply calls services via URL path
4	Does not return human readable result	Result is readable which is just plain XML or JSON
5	Transfer is over HTTP. Also uses other protocols such as SMTP, FTP, etc.	Transfer is over HTTP only
6	JavaScript can call SOAP, but it is difficult to implement	Easy to call from JavaScript

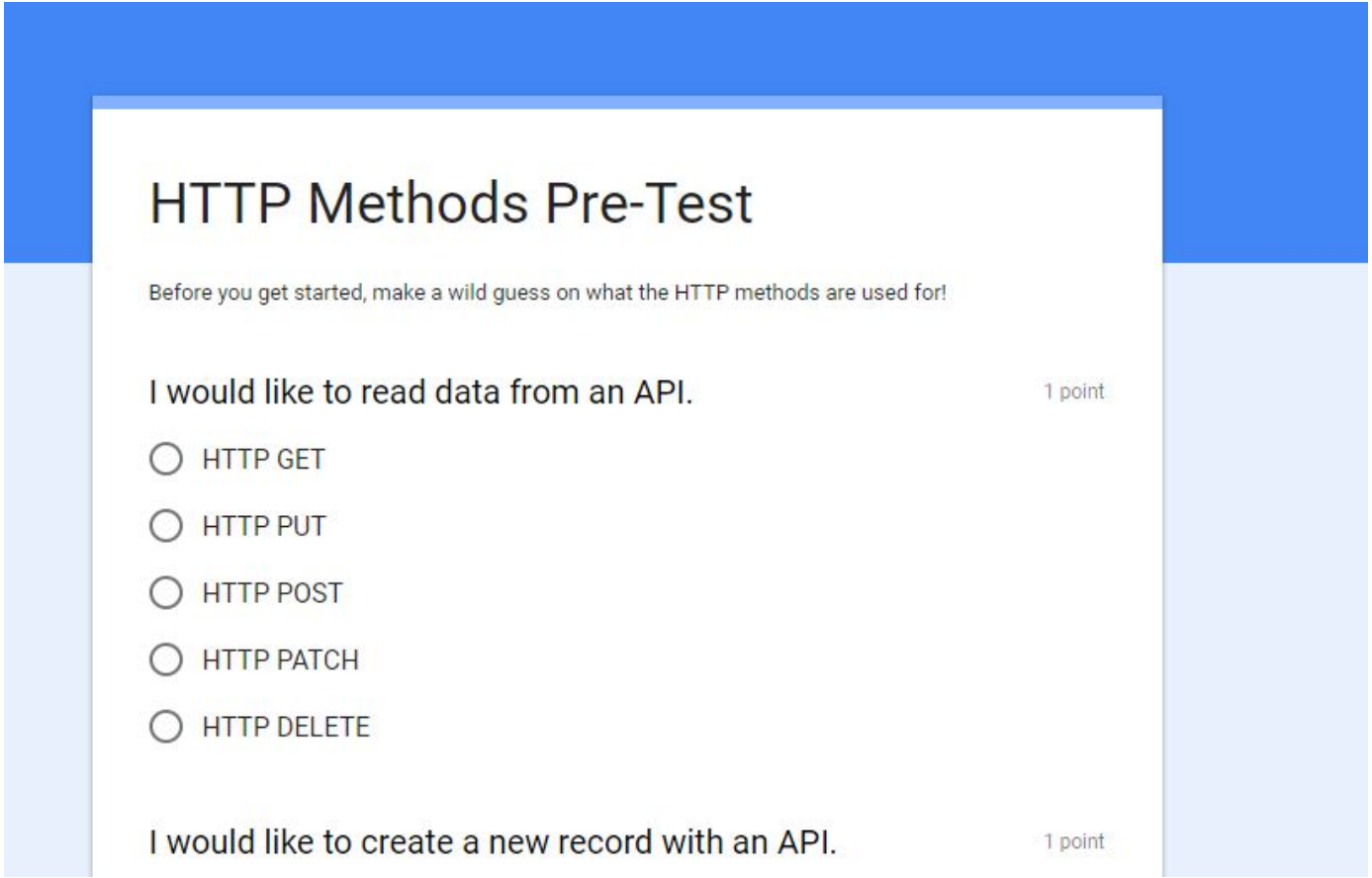
http://www.differencebetween.net/technology/internet/difference-between-rest-and-soap/

Understanding REST

HTTP Methods (verbs)



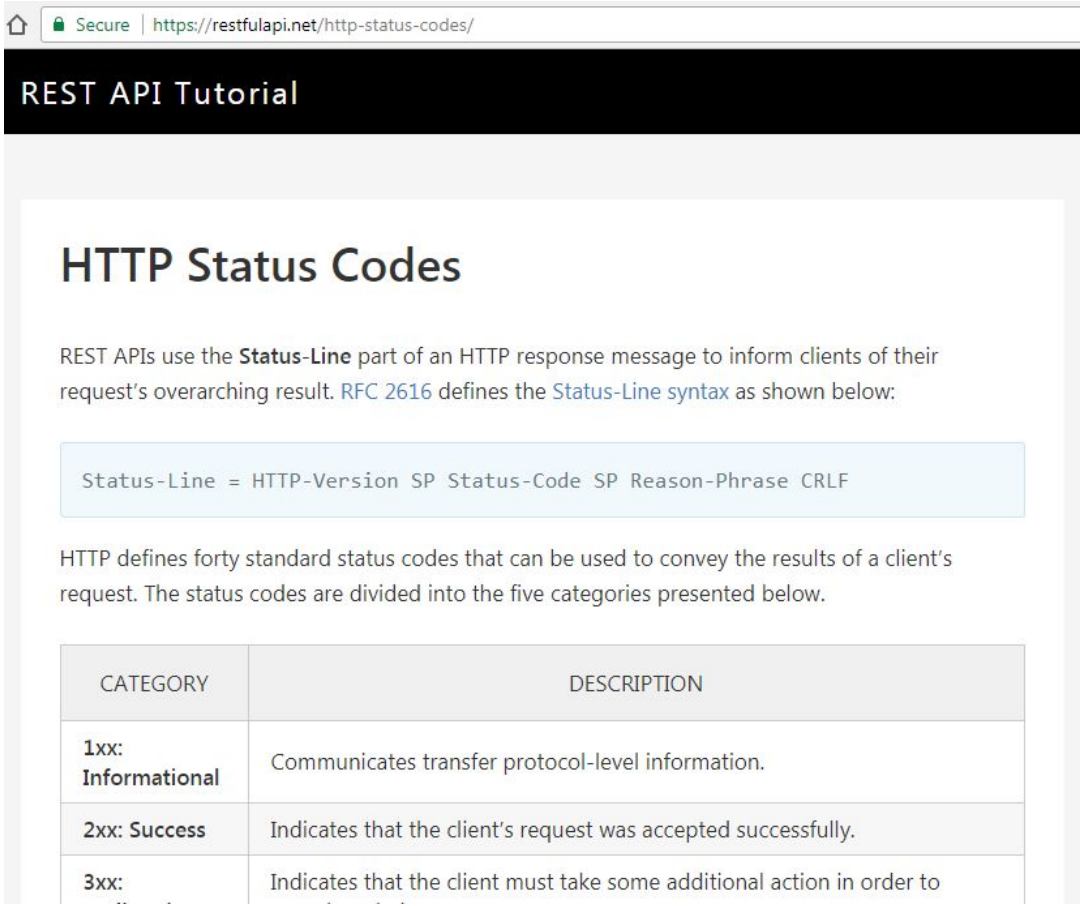
https://restfulapi.net/http-methods/



https://docs.google.com/forms/d/e/1FAIpQLSdQkaY3lBGIjN2oNjjrgxKwur2E7zK2gonp8Uw8p4RoH4fZSQ/viewform?c=0&w=1&usp=mail_form_link

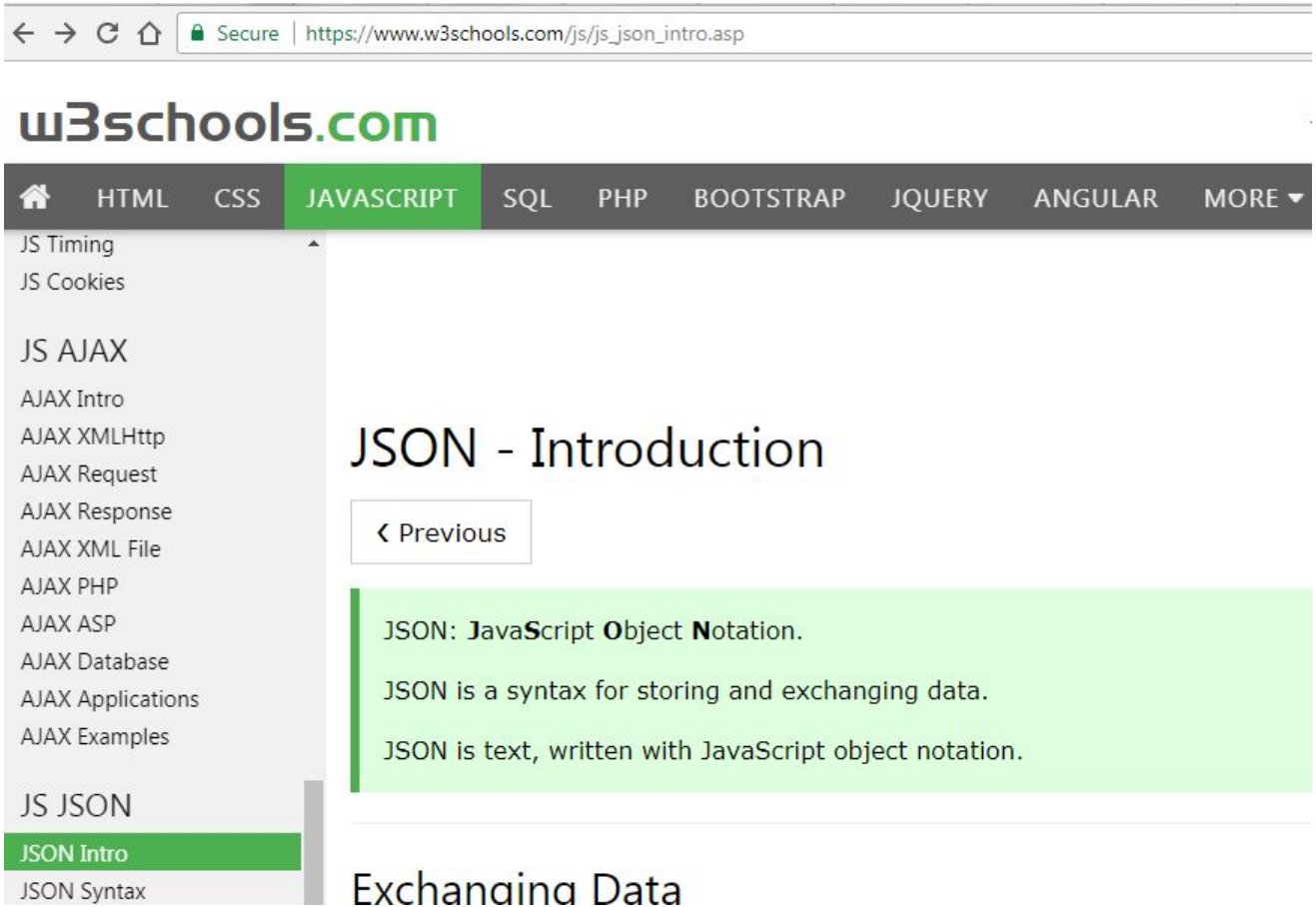
Understanding REST

HTTP Response Codes (status codes)



https://restfulapi.net/http-status-codes/

Understanding JSON



https://www.w3schools.com/js/js_json_intro.asp

Lab 2

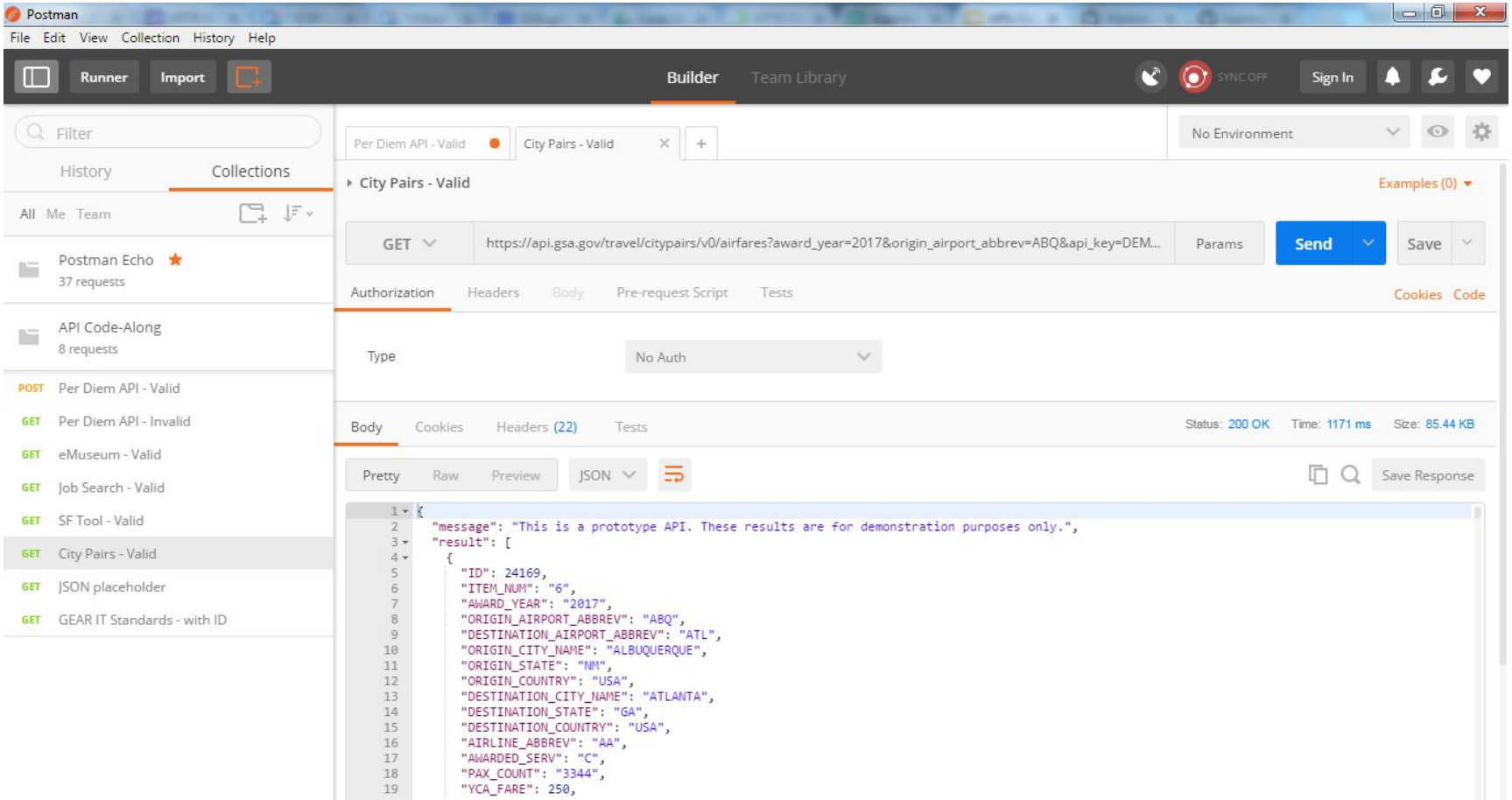
Exploring the Prototype City Pairs API

Lab 3

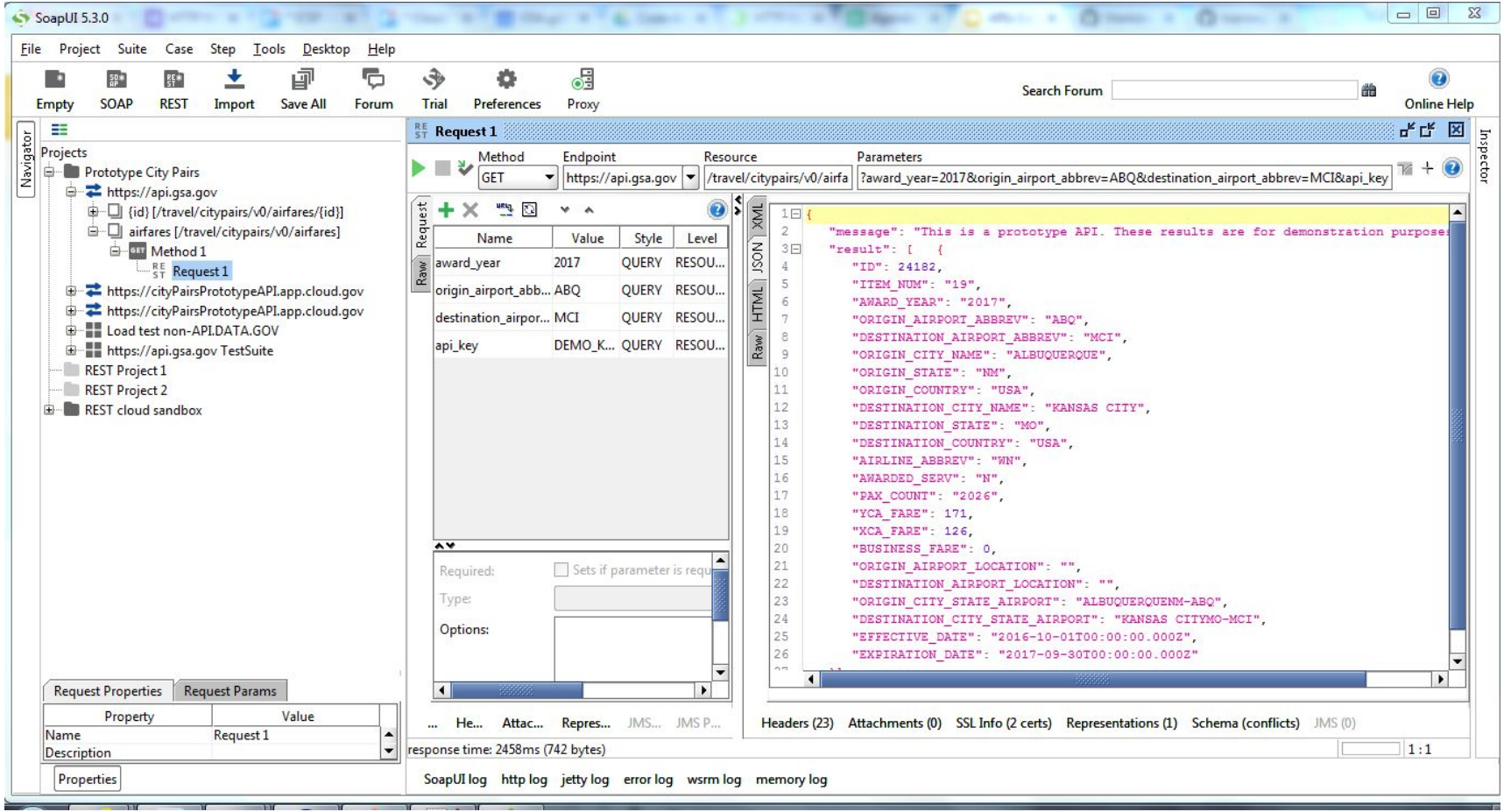
Tour of the GSA APIs

API Tools Demonstration

GSA Approved Tools


Postman
File Edit View Collection History Help
Runner
Import
Builder
Team Library
SYNC OFF
Sign In
Filter
History
Collections
All Me Team
Postman Echo
37 requests
API Code-Along
8 requests
POST Per Diem API - Valid
GET Per Diem API - Invalid
GET eMuseum - Valid
GET Job Search - Valid
GET SF Tool - Valid
GET City Pairs - Valid
GET JSON placeholder
GET GEAR IT Standards - with ID
Per Diem API - Valid
City Pairs - Valid
No Environment
City Pairs - Valid
Examples (0)
GET
https://api.gsa.gov/travel/citypairs/v0/airfares?award_year=2017&origin_airport_abbrev=ABQ&api_key=DEM...
Params
Send
Save
Authorization
Headers
Body
Pre-request Script
Tests
Cookies
Code
Type
No Auth
Body
Cookies
Headers (22)
Tests
Status: 200 OK
Time: 1171 ms
Size: 85.44 KB
Pretty
Raw
Preview
JSON
Save Response
{
"message": "This is a prototype API. These results are for demonstration purposes only.",
"result": [
{
"ID": 24169,
"ITEM_NUM": "6",
"AWARD_YEAR": "2017",
"ORIGIN_AIRPORT_ABBREV": "ABQ",
"DESTINATION_AIRPORT_ABBREV": "ATL",
"ORIGIN_CITY_NAME": "ALBUQUERQUE",
"ORIGIN_STATE": "NM",
"ORIGIN_COUNTRY": "USA",
"DESTINATION_CITY_NAME": "ATLANTA",
"DESTINATION_STATE": "GA",
"DESTINATION_COUNTRY": "USA",
"AIRLINE_ABBREV": "AA",
"AWARDED_SERV": "C",
"PAX_COUNT": "3344",
"YCA_FARE": 250,

PostMan


SoapUI 5.3.0
File Project Suite Case Step Tools Desktop Help
Empty SOAP REST Import Save All Forum Trial Preferences Proxy
Search Forum
Online Help
Navigator
Projects
Prototype City Pairs
https://api.gsa.gov
{id} [/travel/citypairs/v0/airfares/{id}]
airfares [/travel/citypairs/v0/airfares]
Method 1
Request 1
https://cityPairsPrototypeAPI.app.cloud.gov
https://cityPairsPrototypeAPI.app.cloud.gov
Load test non-API.DATA.GOV
https://api.gsa.gov TestSuite
REST Project 1
REST Project 2
REST cloud sandbox
Request Properties
Request Params
Property
Value
Name
Request 1
Description
Properties
Request 1
Method
GET
Endpoint
https://api.gsa.gov
Resource
/travel/citypairs/v0/airfa
Parameters
?award_year=2017&origin_airport_abbrev=ABQ&destination_airport_abbrev=MCI&api_key
Request
Raw
Name
Value
Style
Level
award_year
2017
QUERY
RESOU...
origin_airport_abb...
ABQ
QUERY
RESOU...
destination_airpor...
MCI
QUERY
RESOU...
api_key
DEMO_K...
QUERY
RESOU...
Required:
Type:
Options:
XML
JSON
HTML
Raw
{
"message": "This is a prototype API. These results are for demonstration purpose
"result": [{
"ID": 24182,
"ITEM_NUM": "19",
"AWARD_YEAR": "2017",
"ORIGIN_AIRPORT_ABBREV": "ABQ",
"DESTINATION_AIRPORT_ABBREV": "MCI",
"ORIGIN_CITY_NAME": "ALBUQUERQUE",
"ORIGIN_STATE": "NM",
"ORIGIN_COUNTRY": "USA",
"DESTINATION_CITY_NAME": "KANSAS CITY",
"DESTINATION_STATE": "MO",
"DESTINATION_COUNTRY": "USA",
"AIRLINE_ABBREV": "WN",
"AWARDED_SERV": "N",
"PAX_COUNT": "2026",
"YCA_FARE": 171,
"XCA_FARE": 126,
"BUSINESS_FARE": 0,
"ORIGIN_AIRPORT_LOCATION": "",
"DESTINATION_AIRPORT_LOCATION": "",
"ORIGIN_CITY_STATE_AIRPORT": "ALBUQUERQUENM-ABQ",
"DESTINATION_CITY_STATE_AIRPORT": "KANSAS CITYMO-MCI",
"EFFECTIVE_DATE": "2016-10-01T00:00:00.000Z",
"EXPIRATION_DATE": "2017-09-30T00:00:00.000Z"
... He... Attac... Repres... JMS... JMS P...
Headers (23) Attachments (0) SSL Info (2 certs) Representations (1) Schema (conflicts) JMS (0)
response time: 2458ms (742 bytes)
1 : 1
Inspector
SoapUI log http log jetty log error log wsrm log memory log

SOAPUI

Lab 4

Solving Business Problems with APIs

BREAK

Back at 1:50

Lab 5

Use HTML and JavaScript to consume APIs.

Lab 6

Using Google Scripts to pull API data.

Wrapping Up

Q&A and Next Steps

Join the API Working Group

Join our mailing list and attend quarterly meetings of the API Working Group.

Email Joe Castle (joseph.castle@gsa.gov) to be added to the list.

Thanks for your time!

Ryan Day

Corporate IT Services (IC)

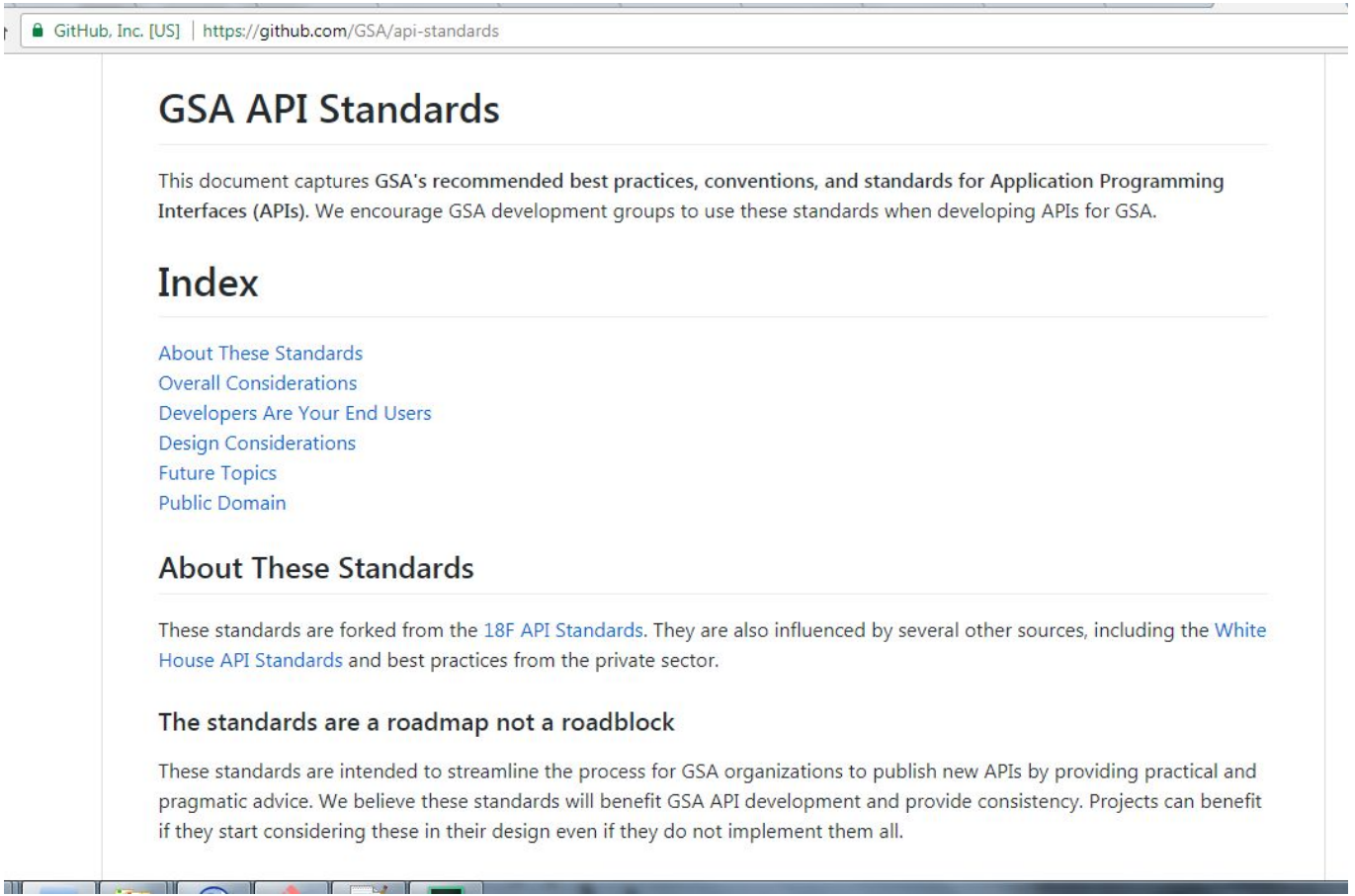
816-823-5322

ryan.day@gsa.gov

Extra Slides

GSA API Standards

Best practices for API providers



https://github.com/GSA/api-standards

Lab 7 (extra)

Brainstorming for new APIs