

Blasting off with the GitHub API

Get a boost with this guided tour of the GitHub API.



Jamie Strusz

Services Engineer @ GitHub

Likes art; travels in a vanagon with dog and boyfriend

 allthedoll



Source: <https://www.instagram.com/yorickthecorgi/>



Steve Winton

Solutions Engineer @ GitHub

**British; resembles Detective Inspector Greg Lestrade
on Sherlock**

 **swinton**

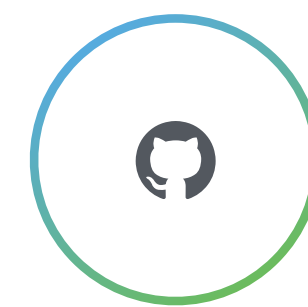


Steve Winton
or
Inspector Lestrade?

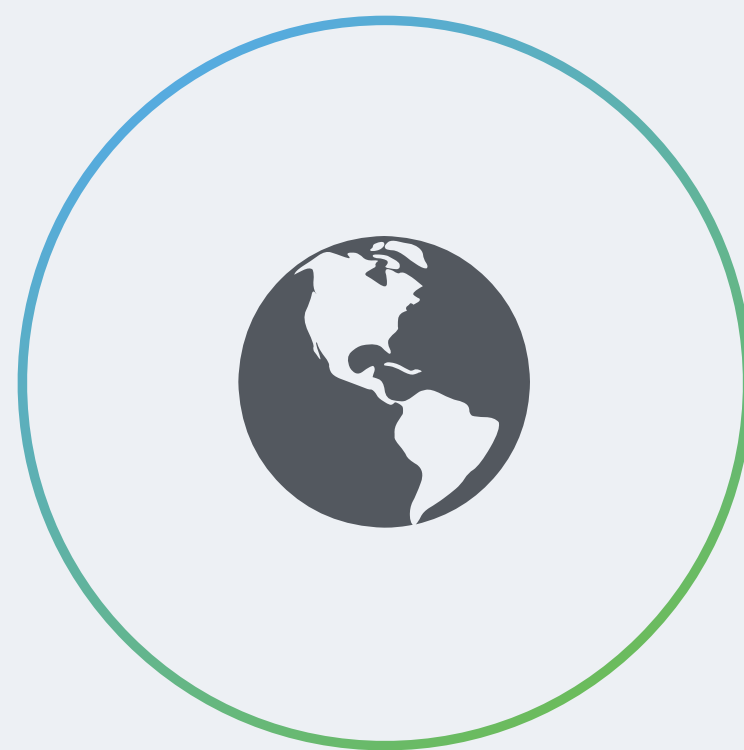


We just don't know.

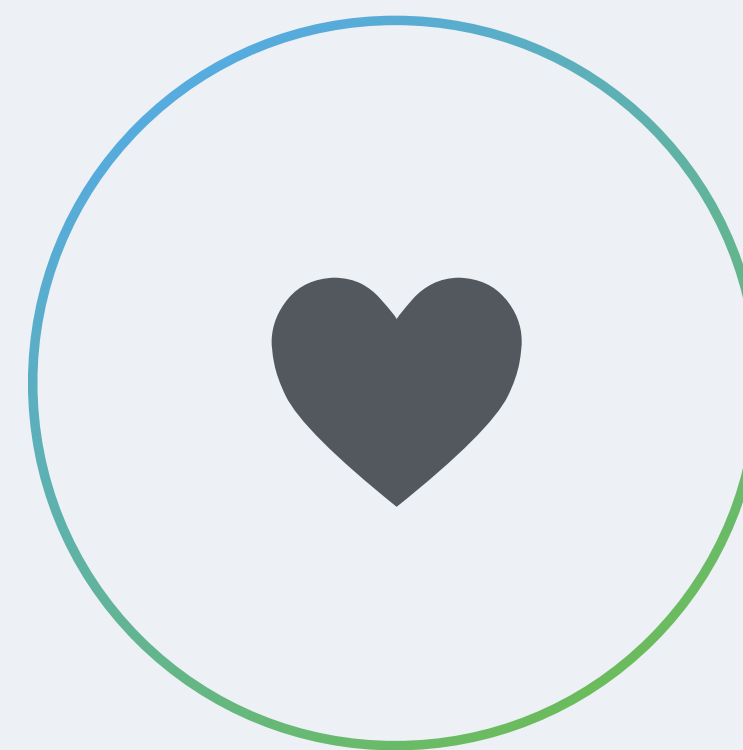
The agenda



LAUNCH
Why even API?

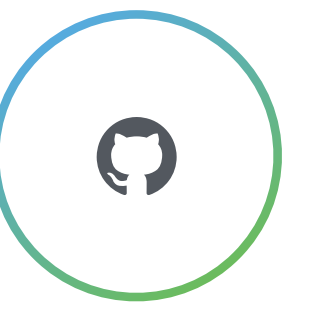


ORBIT
How to API.



FLIGHT
Yay, GitHub API!

Launch: why even API?



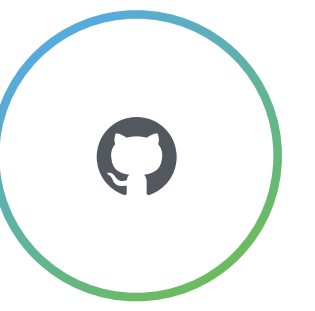
Source: developer.github.com

Lesson 0



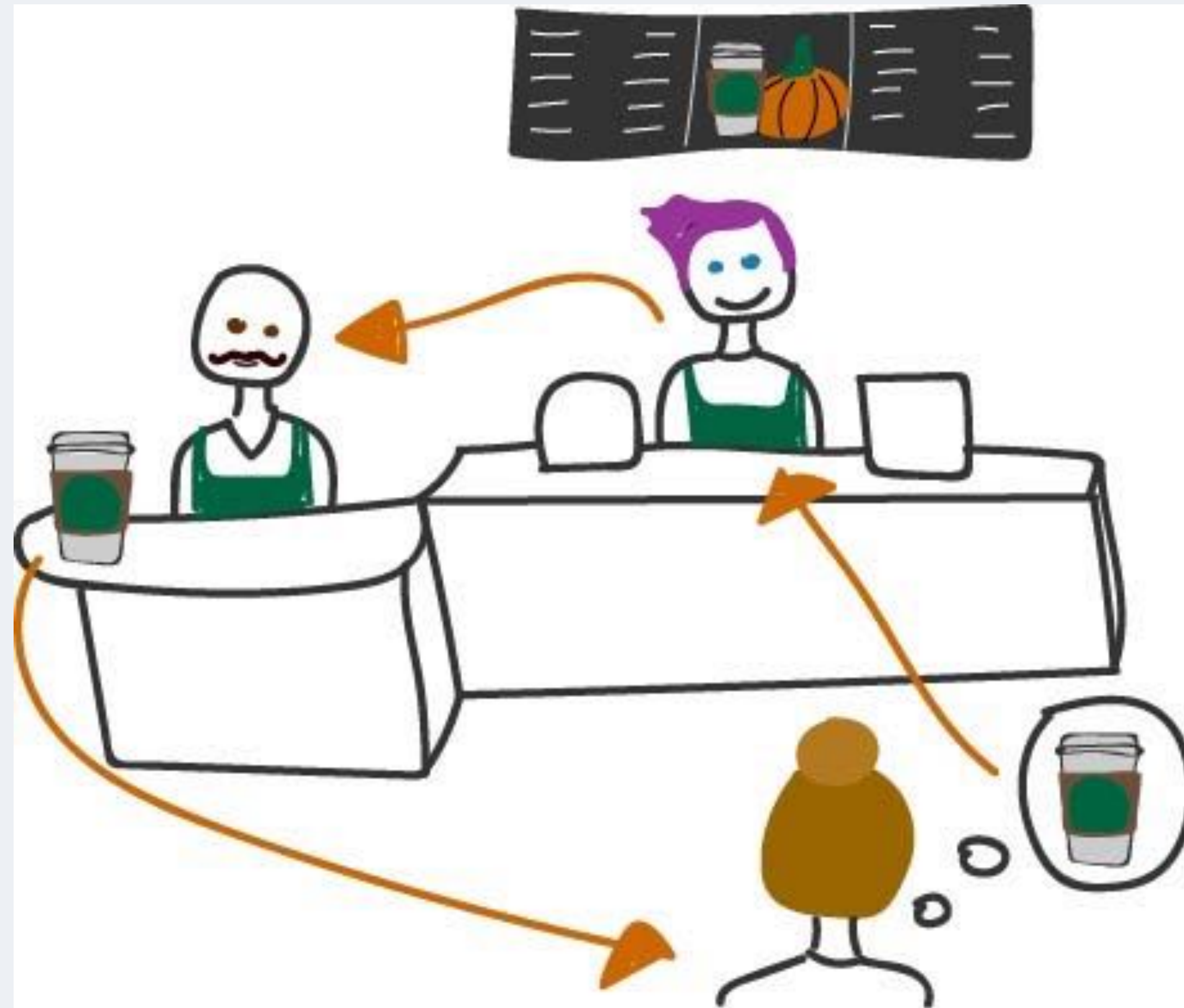
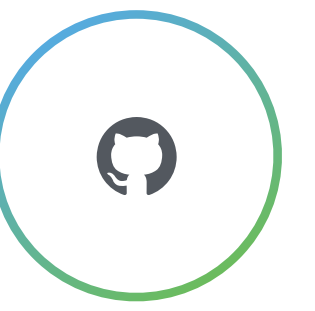
- **What is an API?**
- **Why even API?**
- **Why use the GitHub API?**
- **Introduction to the GitHub API**

What is an API?



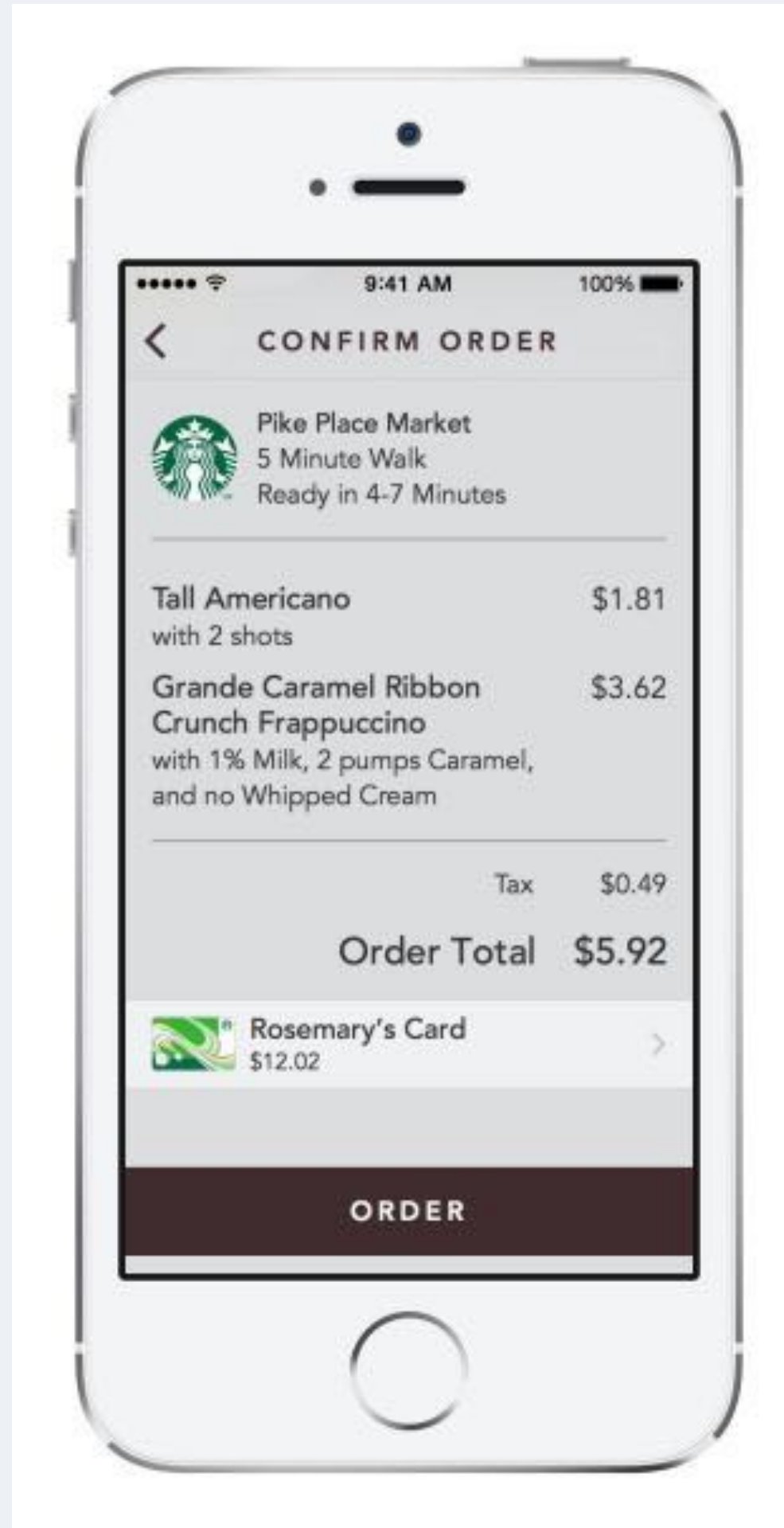
Source: memegenerator.net

Cool story, what does that *mean*?



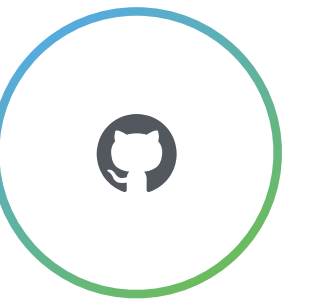
Source: allthedoll

What about an *actual* Starbucks API?



Source: wired.com

The bottom line:



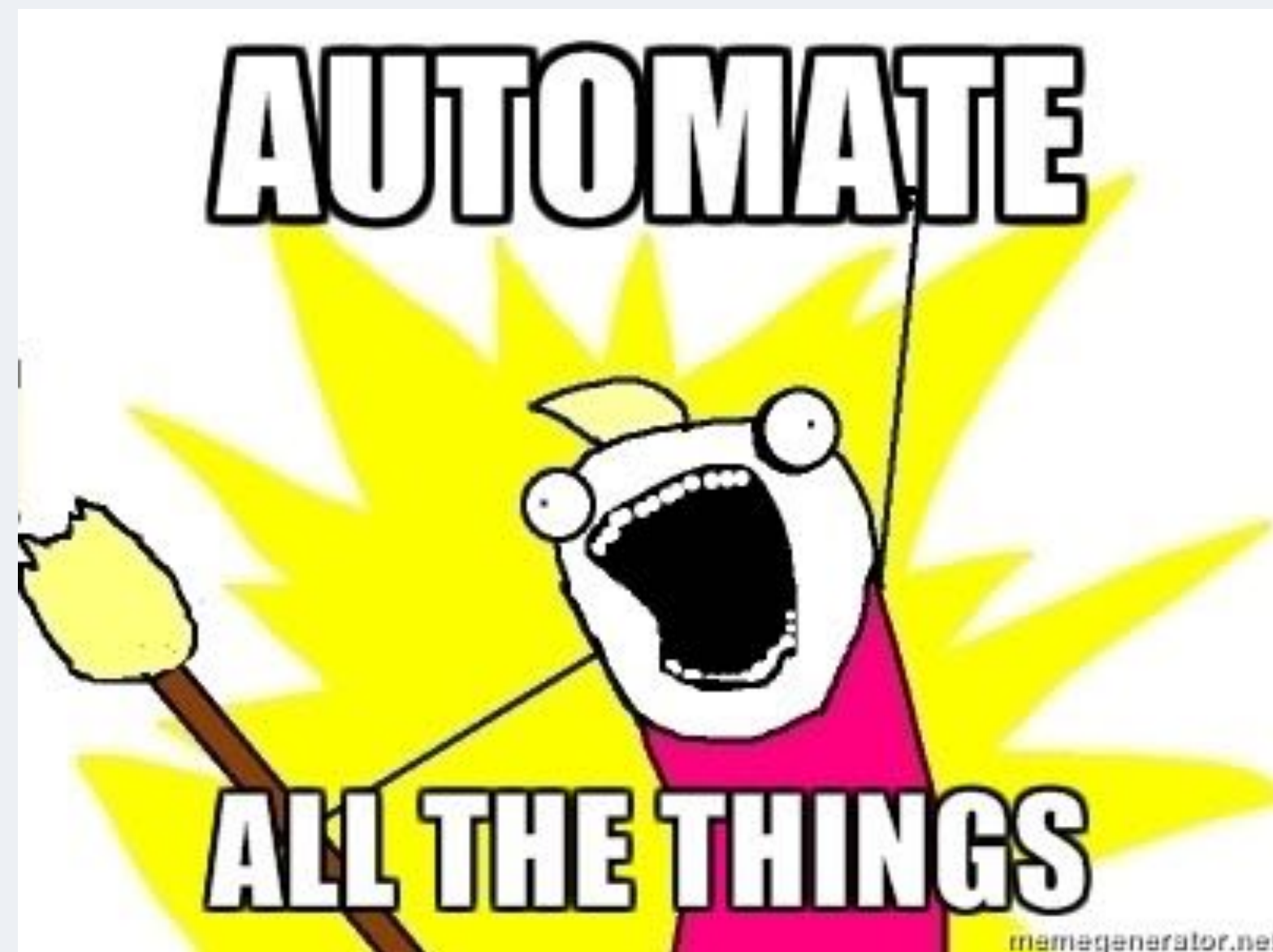
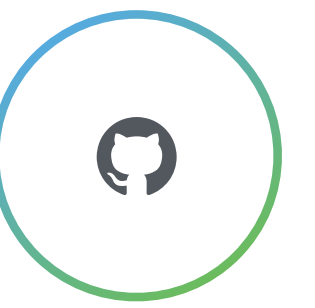
Source: allthedoll

Why even API?



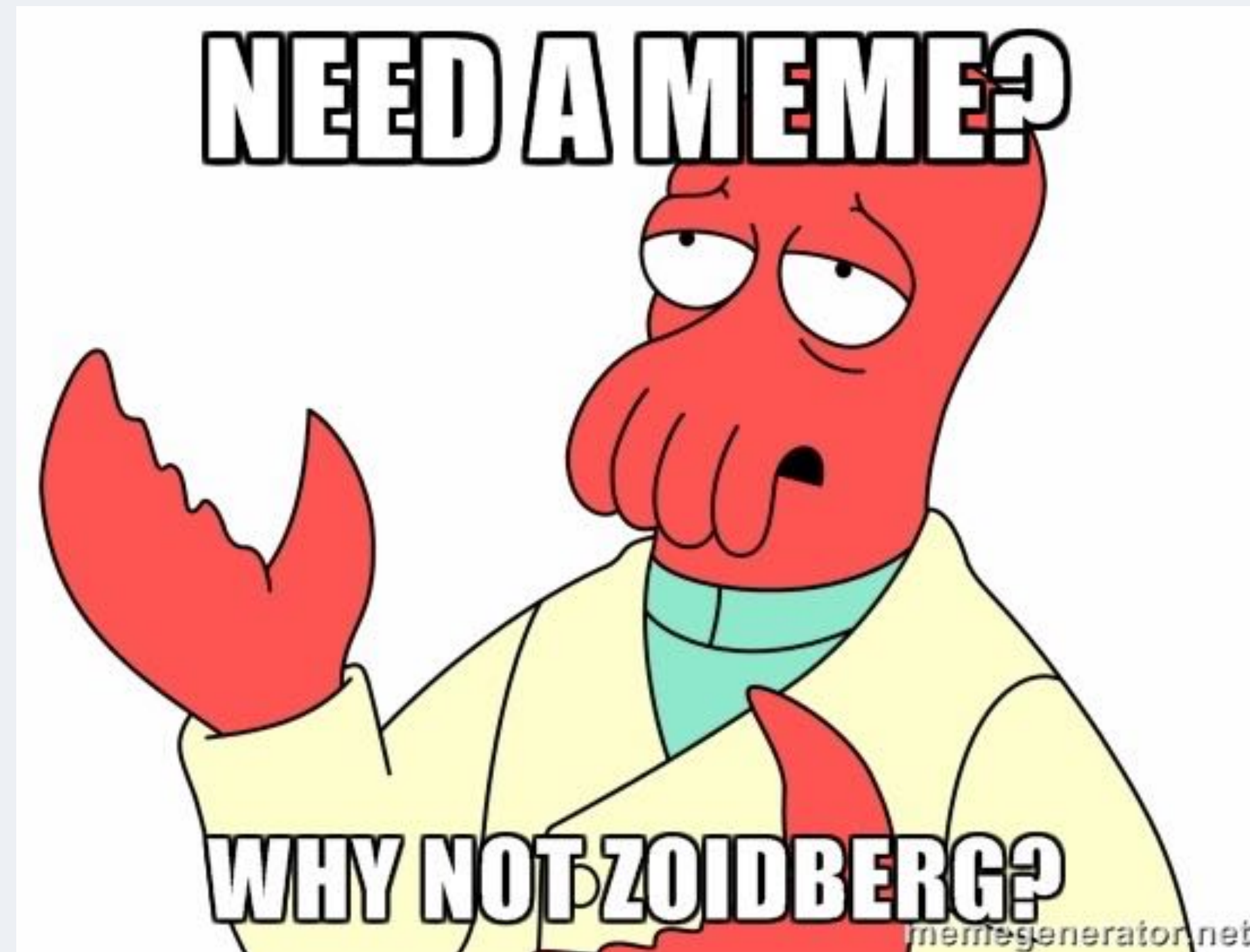
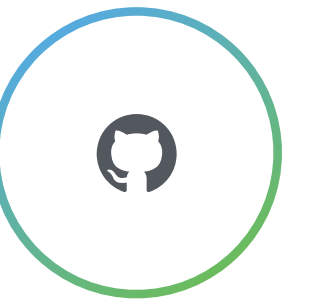
Source: johnthetoyshopguy.files.wordpress.com

Save time, boredom, and frustration.



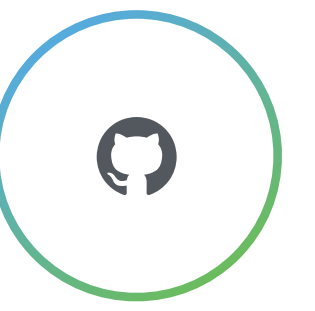
Source: memegenerator.net

Why use the GitHub API?



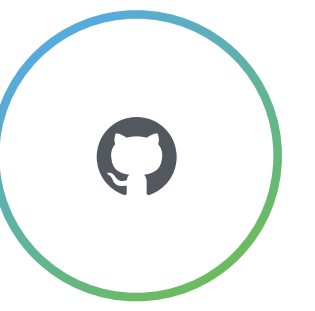
Source: memegenerator.net

Examples of what the GitHub API can be used for...



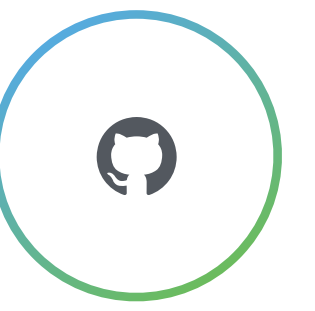
Source: octodex.github.com

Introduction to the GitHub API



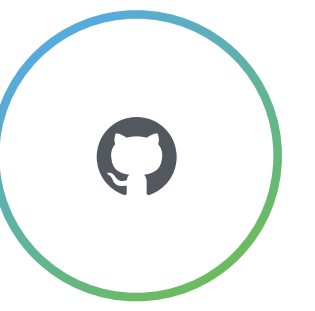
Source: animateit.net

The GitHub API is RESTful



Source: memegenerator.net

The GitHub API is a Hypermedia API



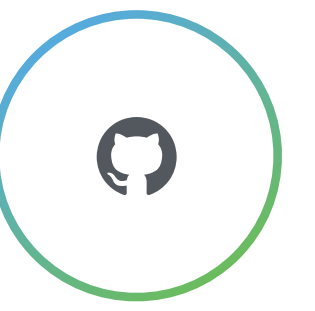
Source: gifs.joelglovier.com

The GitHub API returns JSON



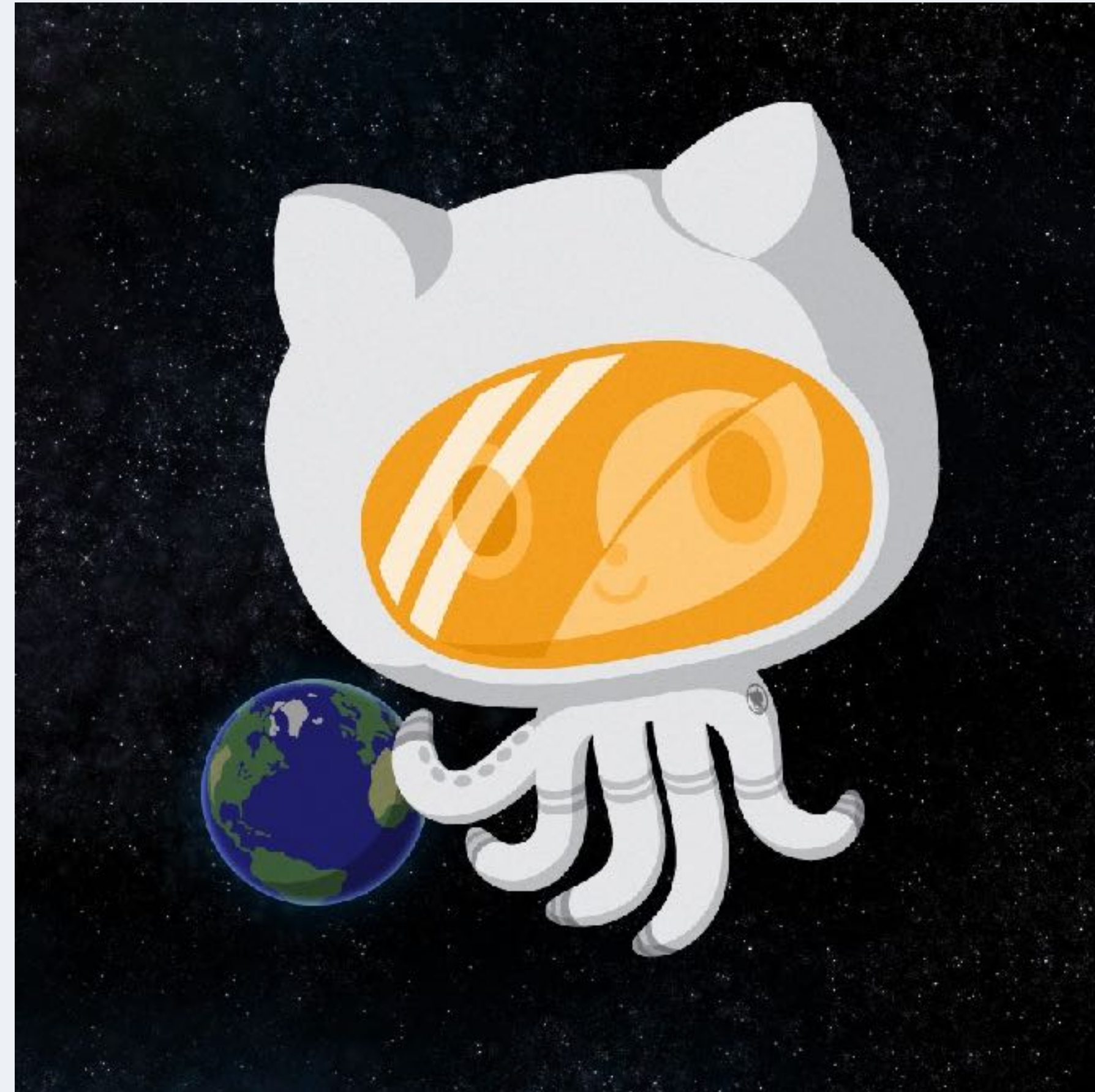
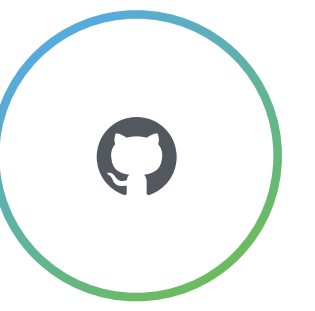
Source: memegenerator.net

The GitHub API is currently at /v3



Source: memegenerator.net

Orbit: how to API.



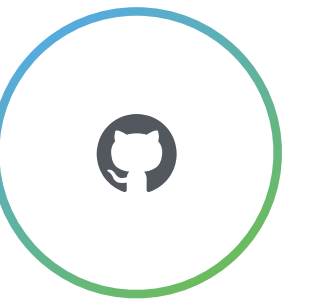
Source: octodex.github.com

Lesson 1



- **Making Requests**
 - Interacting with the API

Let's dive in!





JSONView

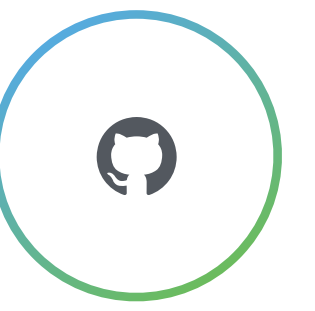
offered by [gildas](#)

★★★★★ (2092) [Developer Tools](#)

```
{
  current_user_url: "https://api.github.com/user",
  current_user_authorizations_html_url: "https://github.com/settings/connections/applications/{client_id}",
  authorizations_url: "https://api.github.com/authorizations",
  code_search_url: "https://api.github.com/search/code?q={query}:{page,per_page,sort,order}",
  emails_url: "https://api.github.com/user/emails",
  emojis_url: "https://api.github.com/emojis",
  events_url: "https://api.github.com/events",
  feeds_url: "https://api.github.com/feeds",
  followers_url: "https://api.github.com/user/followers",
  following_url: "https://api.github.com/user/following/{target}",
  gists_url: "https://api.github.com/gists/{gist_id}",
  hub_url: "https://api.github.com/hub",
  issue_search_url: "https://api.github.com/search/issues?q={query}:{page,per_page,sort,order}",
  issues_url: "https://api.github.com/issues",
  keys_url: "https://api.github.com/user/keys",
  notifications_url: "https://api.github.com/notifications",
  organization_repositories_url: "https://api.github.com/orgs/{org}/repos?type={type,page,per_page,sort}",
  organization_url: "https://api.github.com/orgs/{org}",
  public_gists_url: "https://api.github.com/gists/public",
  rate_limit_url: "https://api.github.com/rate_limit",
  repository_url: "https://api.github.com/repos/{owner}/{repo}",
  repository_search_url: "https://api.github.com/search/repositories?q={query}:{page,per_page,sort,order}",
  current_user_repositories_url: "https://api.github.com/user/repos?type={type,page,per_page,sort}",
  starred_url: "https://api.github.com/user/starred/{owner}/{repo}",
  starred_gists_url: "https://api.github.com/gists/starred",
  team_url: "https://api.github.com/teams",
  user_url: "https://api.github.com/users/{user}",
  user_organizations_url: "https://api.github.com/user/orgs",
  user_repositories_url: "https://api.github.com/users/{user}/repos?type={type,page,per_page,sort}",
  user_search_url: "https://api.github.com/search/users?q={query}:{page,per_page,sort,order}"
}
```

Source: octodex.github.com and [allthedoll](https://allthedoll.com)

Note that /user returns an *Unauthorized* status...

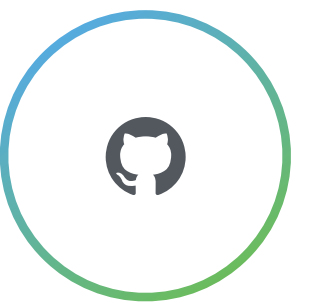


```
{  
  message: "Requires authentication",  
  documentation_url: "https://developer.github.com/v3"  
}
```

```
[poppy:~ allthedoll$ curl current_user_url: "https://api.github.com/user"  
curl: (6) Could not resolve host: current_user_url  
{  
  "message": "Requires authentication",  
  "documentation_url": "https://developer.github.com/v3"  
}
```

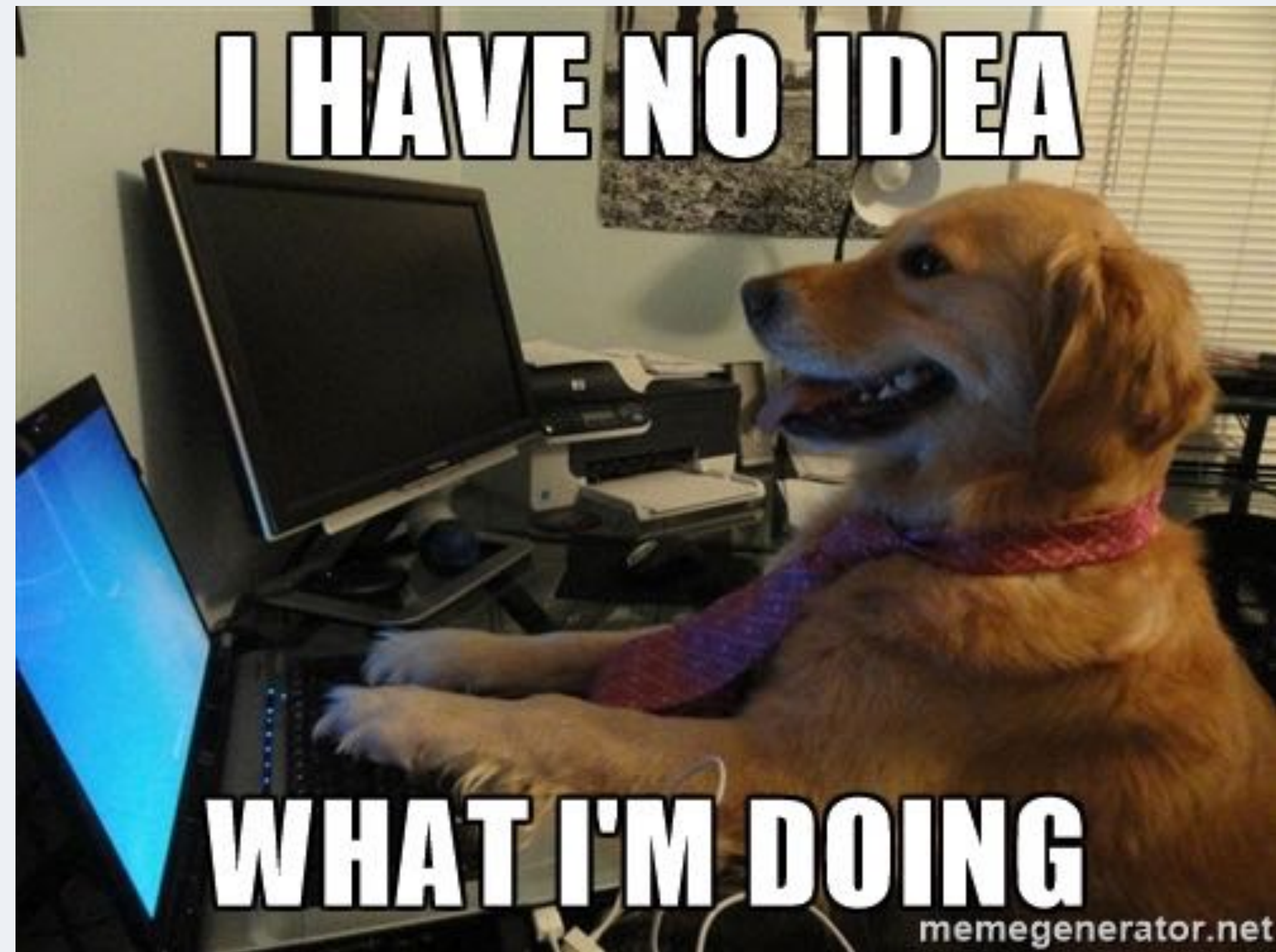
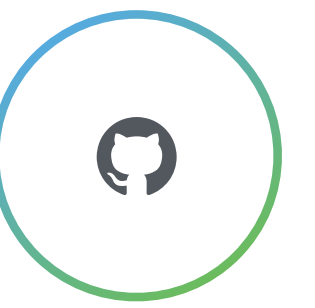


Source: giphy.com and allthedoll



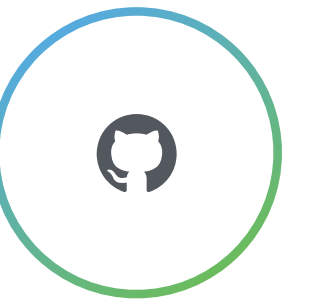
- **Diving a little deeper**
 - More on that command line, though
 - Some example requests with cURL

The Command-line



Source: memegenerator.net

Example requests



- **curl <https://api.github.com/zen>**

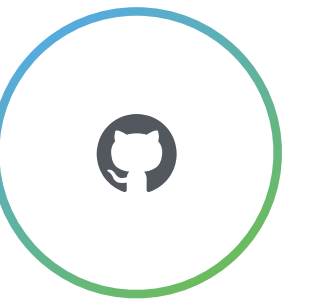
```
[poppy:~ allthedoll$ curl https://api.github.com/zen  
Responsive is better than fast.poppy:~ allthedoll$
```

- **curl -i <https://api.github.com/users/octocat>**

- Note some interesting headers here:

- X-RateLimit-Limit
- X-RateLimit-Remaining

```
X-RateLimit-Limit: 60  
X-RateLimit-Remaining: 48
```

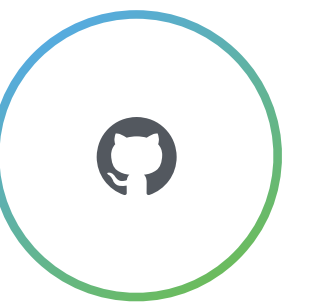
- **HTTPIe**

- A user-friendly replacement for curl
- <https://github.com/jkbrzt/httpie>

- **jq**

- Amazingly useful tool for *processing JSON* from the command-line
- <https://stedolan.github.io/jq/>
- Example:
 - `curl 'https://api.github.com/repos/atom/atom/commits?per_page=5' | jq '[0] | {message: .commit.message, name: .commit.committer.name}'`

<https://developer.github.com/libraries/>



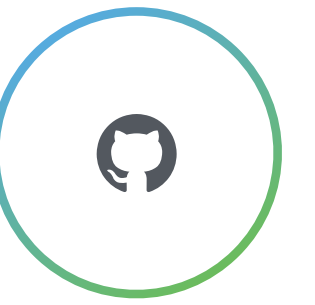
Source: quickmeme.com

Lesson 3



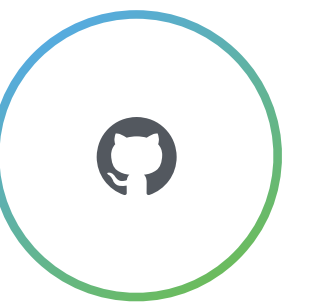
- **Rate limits**
 - Bummer.
- **Authentication**
 - Sweet.

Rate limits: a fact of life.



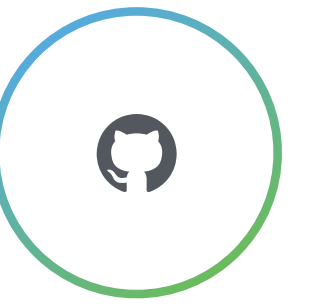
Source: mememaker.net

Sharing isn't always caring.



Source: memegenerator.net

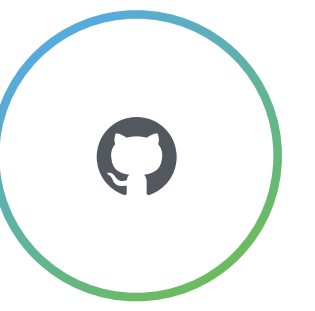
Lesson 4



- **Authentication**

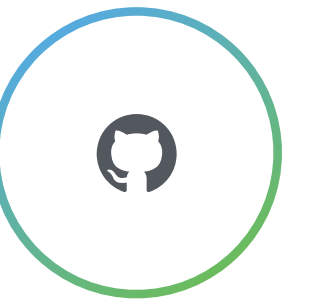
- Basic
- OAuth
- Personal access tokens

Remember that /user request?



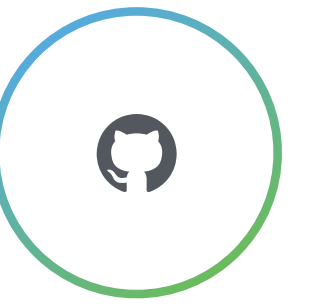
Source: memes.com

Authenticating



- **Basic auth**

- `curl -u "swinton:$GITHUB_PASS" -i https://api.github.com/user`
- **2FA**
 - `curl -u "swinton:$GITHUB_PASS" -H "X-GitHub-OTP: $GITHUB_OTP" -i https://api.github.com/user`
 - This is painful, and sharing passwords with others (including applications) is an anti-pattern.



- **TLDR: OAuth gives third-parties access to *your stuff* without you sharing your password**
 - It uses *access keys*, which limits the scope of what third parties can do
 - Different access keys can be issued per third-party to track *who did what with your stuff*

Personal access tokens are like hotel keys



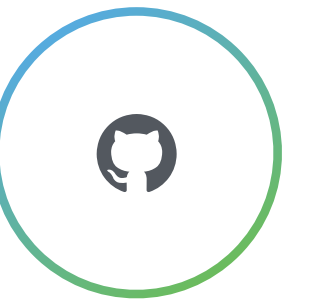
Source: memegenerator.net

Personal access tokens



- **TLDR: Personal access tokens give third-parties access to *your stuff* without you sharing your password**
 - Tokens act like *you* when they're used, so keep them secret
 - Different access keys can be issued per third-party to track *who did what with your stuff*

Let's generate an access token super quick



- **<https://github.com/settings/tokens>**

Personal access tokens

Revoke all

Generate new token

- **Give it a good *Token description***

Token description

GitHub Universe Training Day API Demo

Source: allthedoll

Select the scope



Select scopes

Scopes define the access for personal tokens. [Read more about OAuth scopes.](#)

<input checked="" type="checkbox"/> repo	Full control of private repositories
<input checked="" type="checkbox"/> repo:status	Access commit status
<input checked="" type="checkbox"/> repo:deployment	Access deployment status
<input checked="" type="checkbox"/> public_repo	Access public repositories
<input type="checkbox"/> admin:org	Full control of orgs and teams
<input type="checkbox"/> write:org	Read and write org and team membership
<input type="checkbox"/> read:org	Read org and team membership
<input type="checkbox"/> admin:public_key	Full control of user public keys
<input type="checkbox"/> write:public_key	Write user public keys
<input type="checkbox"/> read:public_key	Read user public keys
<input type="checkbox"/> admin:repo_hook	Full control of repository hooks
<input type="checkbox"/> write:repo_hook	Write repository hooks
<input type="checkbox"/> read:repo_hook	Read repository hooks
<input type="checkbox"/> admin:org_hook	Full control of organization hooks
<input type="checkbox"/> gist	Create gists
<input type="checkbox"/> notifications	Access notifications
<input checked="" type="checkbox"/> user	Update all user data
<input checked="" type="checkbox"/> user:email	Access user email addresses (read-only)
<input checked="" type="checkbox"/> user:follow	Follow and unfollow users
<input type="checkbox"/> delete_repo	Delete repositories
<input type="checkbox"/> admin:pgp_key	Full control of user gpg keys (Developer Preview)
<input type="checkbox"/> write:pgp_key	Write user gpg keys
<input type="checkbox"/> read:pgp_key	Read user gpg keys

Generate token

Cancel

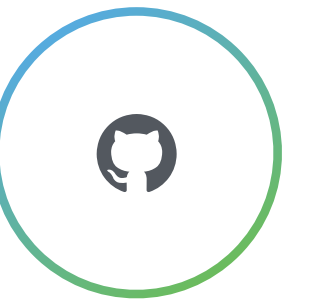
Source: swinton

Let's use it!



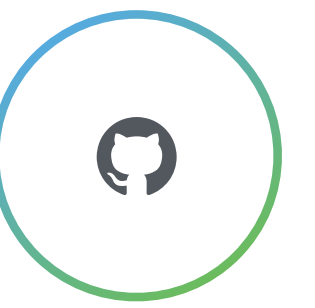
- **Copy your access token (treat it like a password), and save it in an environment variable**
 - `GITHUB_ACCESS_TOKEN2=$(pbpaste)`
- **Hit up the API!**
 - `curl -i -H "Authorization: token $GITHUB_ACCESS_TOKEN2" https://api.github.com/user`

Sweet.



Source: mylittlebrony.com

netrc super happy fun time



Source: blog.myetutor.tv

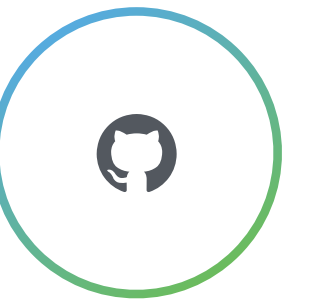
Lesson 5



- **Oktokit!**

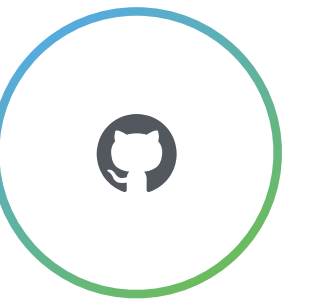
- <https://github.com/octokit/octokit.rb>

If you build it...



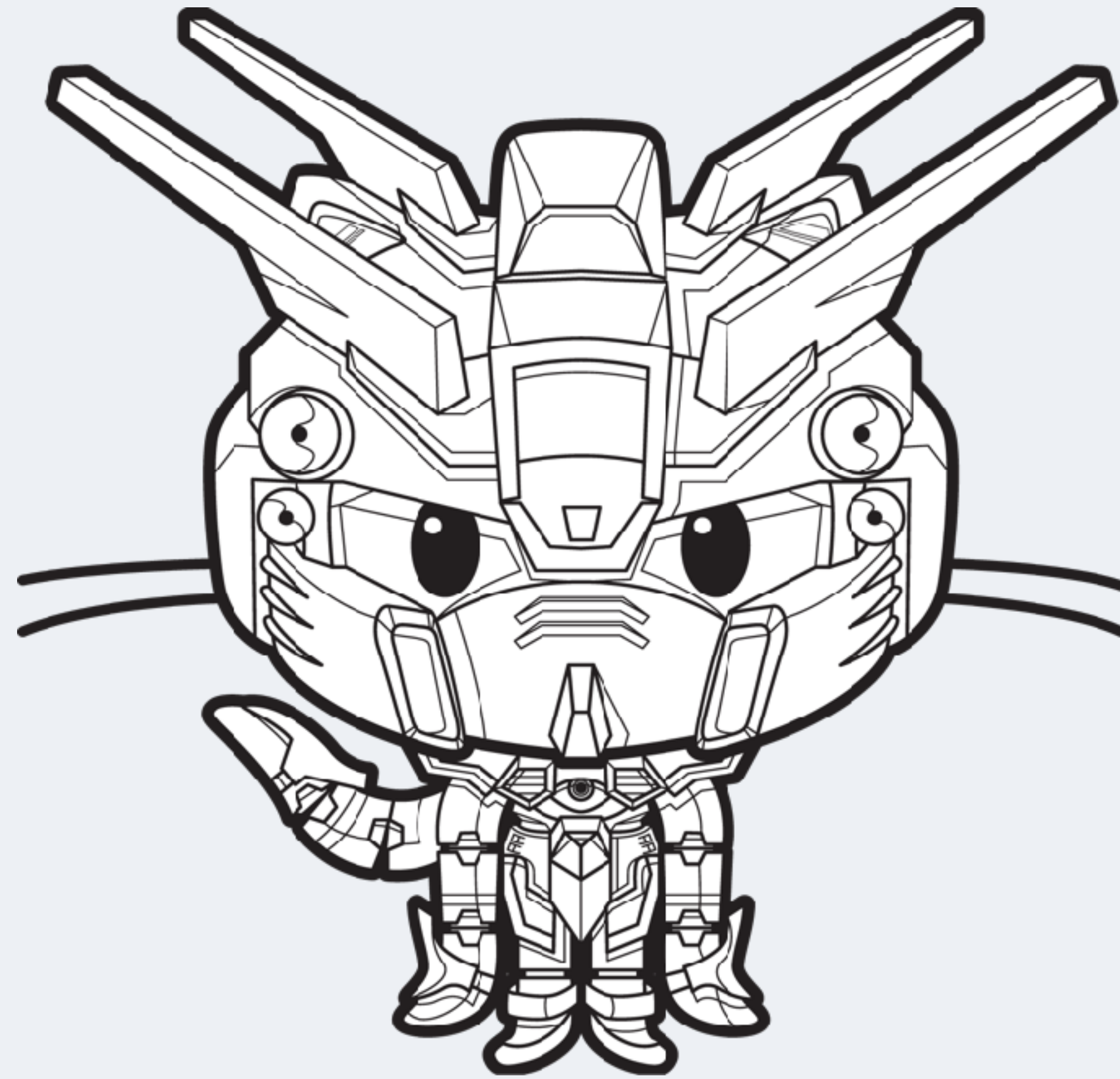
Source: octodex.github.com

Lesson 6

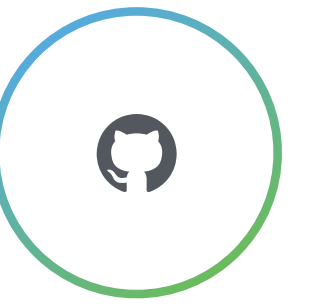


- **Get to know Octokit a little better**
 - **Events**
 - Pagination
 - Everything you did today on GitHub

Fully evolved Octokit

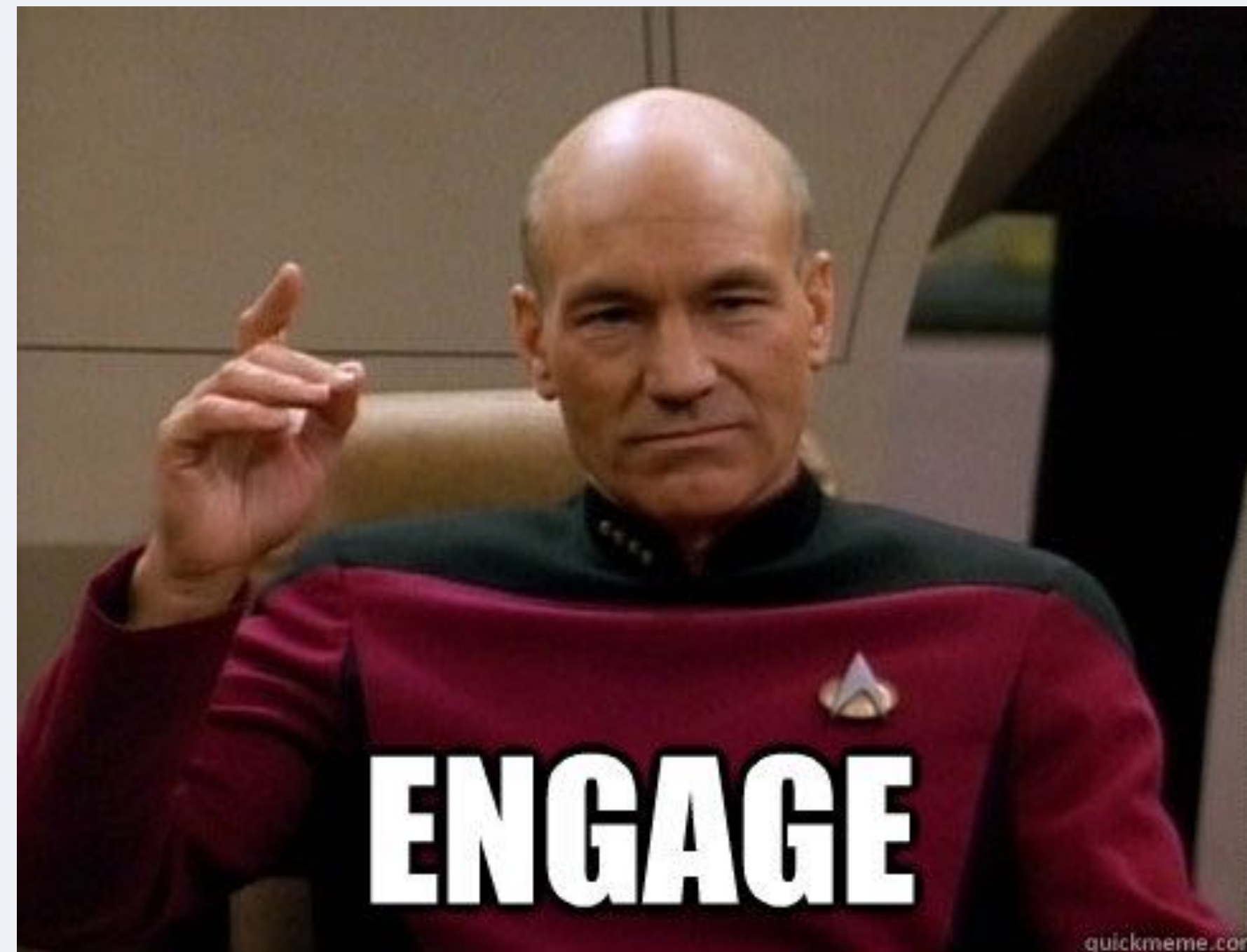
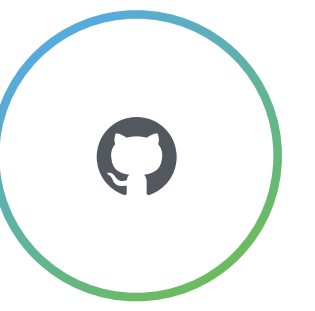


Source: octodex.github.com



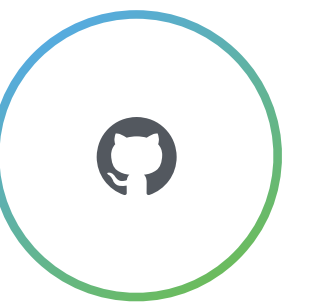
- **What is a webhook and why is it not an API?**
- **Webhooks and GitHub**
 - Configure a webhook to call your web app
 - Test it by changing something on GitHub

What is a webhook and why is it not an API?



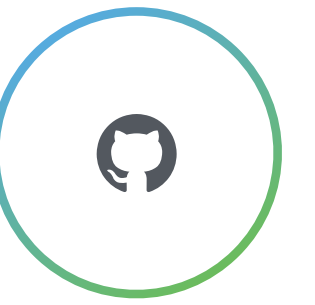
Source: quickmeme.com

Webhooks and GitHub



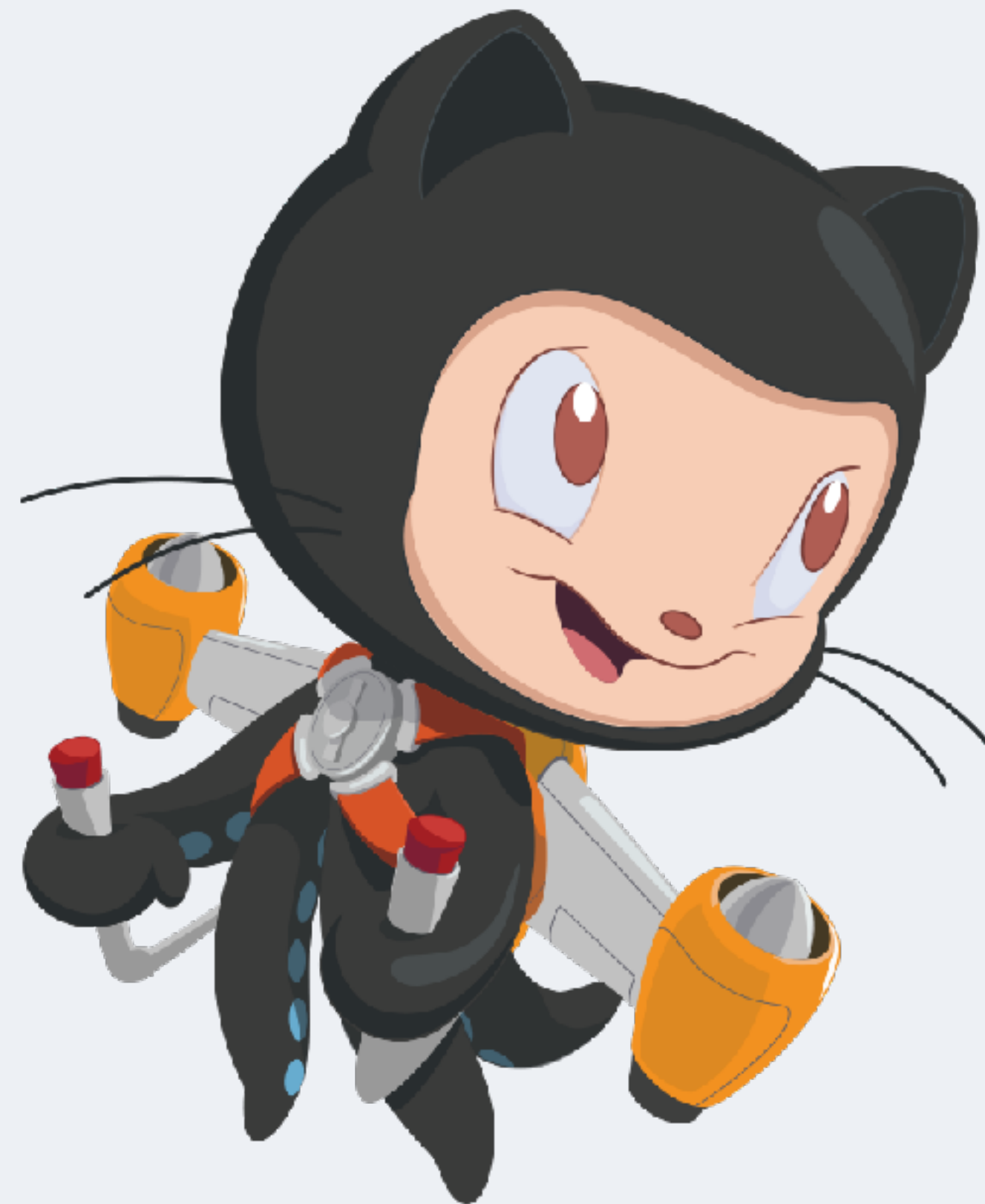
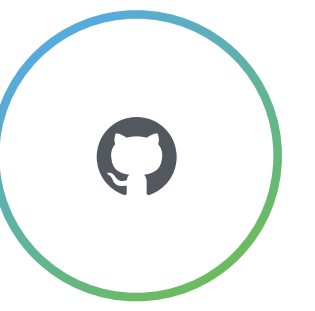
Source: technologytell.com

Demo it, Steve!



Source: imgflip.com

Flight: yay, GitHub API!

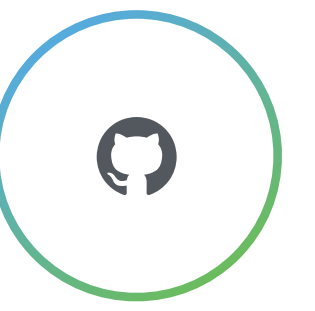


Source: octodex.github.com



- **Other resources exposed by the GitHub API**

Look at all the possibilities I have!



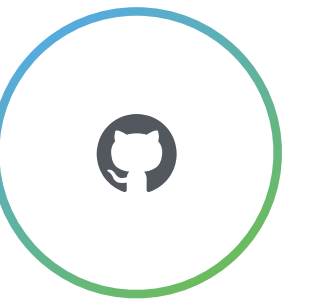
Source: [technologytell.com](https://www.technologytell.com)



- **Other useful tools for API development**

- **httpbin.org** - <https://httpbin.org/>
 - HTTP request and response service
- **[ngrok](https://ngrok.com/)** - <https://ngrok.com/>
 - Secure tunnels to localhost
- **[Charles](https://www.charlesproxy.com/)** - <https://www.charlesproxy.com/>
 - HTTP proxy / HTTP monitor / Reverse proxy to view all HTTP and SSL/HTTPS traffic
- **[Paw](https://paw.cloud/)** - <https://paw.cloud/>
 - A full-featured HTTP client that lets you test the APIs you build or consume
- **[Postman](https://www.getpostman.com/)** - <https://www.getpostman.com/>
 - Build APIs, faster

Lesson 10



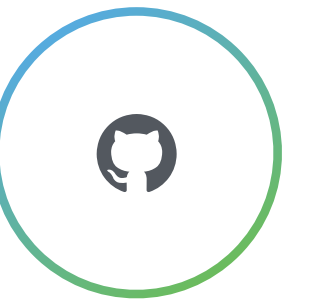
- **Try different things and explore the possibilities!**

Get out there!



Source: [technologytell.com](https://www.technologytell.com)

Our information:



Jamie

You can find Jamie in her van, on GitHub, and
alltheinternet:
[@allthedoll](#)



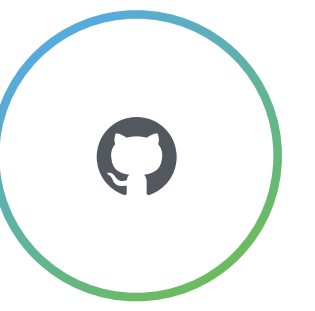
Steve

You can find Steve on BBC's Sherlock, on GitHub, and
the Twitterverse:

 [stevewinton](#)

 [swinton](#)

Thank you!



Source: swinton