6.API.v3

October 26, 2019

Para entrar no modo apresentação, execute a seguinte célula e pressione -

```
[1]: %reload_ext slide
```

```
<IPython.core.display.Javascript object>
```

1 APIs do GitHub (v3)

Este notebook apresenta os seguintes tópicos:

- Section 1.1 - APIs do GitHub
- Section 1.1.1 - Autenticação
- Section 1.2 - API-v3
- Section 1.3 - Exercício 6
- Section 1.4 - Exercício 7
- Section 1.5 - Exercício 8

1.1 APIs do GitHub

Como o GitHub oferece APIs para obter informações de repositórios, usá-las em geral é melhor do que fazer crawling.

O GitHub possui duas versões estáveis de APIs:

- REST API v3: https://developer.github.com/v3/
- GraphQL API v4: https://developer.github.com/v4/

A forma de usar cada API é diferente e a taxa de requisições permitidas também é. Neste minicurso, usaremos requests para acessar ambas as APIs, mas existem bibliotecas prontas (como a PyGitHub para a v3) que fazem o acesso.

1.1.1 Autenticacao

Para usar qualquer uma das APIs, é necessário gerar um token de autenticação no GitHub seguindo os seguintes passos.

Primeiro, vá em configurações da conta.

1

Em seguida, abra configurações de desenvolvedor.

Abra "Personal access tokens" e clique em "Generate new token".

Escolha as permissões que você deseja no token.

Copie o token gerado para algum lugar seguro. Para o minicurso, eu copiei o meu token para
`~/githubtoken.txt` e vou carregá-lo para a variável `token` a seguir.

```python
from ipywidgets import FileUpload, interact
@interact(files=FileUpload())
def set_token(files={}):
    global token
    if files:
        for key, values in files.items():
            token = values['content'].decode("utf-8").strip()
            print("Token Loaded!")
```

```
interactive(children=(FileUpload(value={}, description='Upload'), Output()), _dom_classes=('wi
```

1.2 API v3

Com o token em mãos, podemos começar a usa a API v3. O acesso a API do GitHub é feito a
https://api.github.com. Portanto, precisamos mudar o site de nosso servidor de proxy. Para isso,
podemos fechar e reiniciar da seguinte forma:

`python proxy.py https://api.github.com/`

Inicialmente, vamos fazer uma requisição para verificar se a autenticação funciona e para vermos
nosso limite de requisições.

```python
import requests
SITE = "http://localhost:5000/" # ou https://api.github.com
def token_auth(request):
    request.headers["User-Agent"] = "Minicurso" # Necessário
    request.headers["Authorization"] = "token {}".format(token)
    return request
response = requests.get(SITE, auth=token_auth)
response.status_code
```

```
[3]: 200
```

Resultado 200 - a autenticação funcionou.

O limite de acesso vem definido no header.

```python
response.headers["X-RateLimit-Limit"]
```

```
[4]: '5000'
```

```
[5]: response.headers["X-RateLimit-Remaining"]
```

[5]: '4999'

```
[6]: response.headers["X-RateLimit-Reset"]
```

[6]: '1571985661'

O retorno da API v3 é sempre um JSON. O acesso a https://api.github.com retorna as URLS válidas da API.

```
[7]: response.json()
```

```
[7]: {'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}',
     'commit_search_url':
     'https://api.github.com/search/commits?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,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,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,page,per_page,sort}',
    'user_search_url':
'https://api.github.com/search/users?q={query}{&page,per_page,sort,order}'}
```

Vamos ver o que a API tem sobre algum repositório.

Primeiro precisamos ver qual URL usar.

```
[8]: _['repository_url']
```

```
[8]: 'https://api.github.com/repos/{owner}/{repo}'
```

Em seguida, fazemos a requisição para saber o que tem no repositorio `gems-uff/sapos`.

```
[9]: response = requests.get(SITE + "repos/gems-uff/sapos", auth=token_auth)
     response.status_code
```

```
[9]: 200
```

```
[10]: data = response.json()
      data
```

```
[10]: {'id': 3722240,
       'node_id': 'MDEwOlJlcG9zaXRvcnkzNzIyMjQw',
       'name': 'sapos',
       'full_name': 'gems-uff/sapos',
       'private': False,
       'owner': {'login': 'gems-uff',
        'id': 1486707,
        'node_id': 'MDEyOk9yZ2FuaXphdGlvbjE0ODY3MDc=',
        'avatar_url': 'https://avatars0.githubusercontent.com/u/1486707?v=4',
        'gravatar_id': '',
        'url': 'https://api.github.com/users/gems-uff',
        'html_url': 'https://github.com/gems-uff',
        'followers_url': 'https://api.github.com/users/gems-uff/followers',
        'following_url': 'https://api.github.com/users/gems-
     uff/following{/other_user}',
        'gists_url': 'https://api.github.com/users/gems-uff/gists{/gist_id}',
        'starred_url': 'https://api.github.com/users/gems-uff/starred{/owner}{/repo}',
        'subscriptions_url': 'https://api.github.com/users/gems-uff/subscriptions',
        'organizations_url': 'https://api.github.com/users/gems-uff/orgs',
        'repos_url': 'https://api.github.com/users/gems-uff/repos',
        'events_url': 'https://api.github.com/users/gems-uff/events{/privacy}',
        'received_events_url': 'https://api.github.com/users/gems-
     uff/received_events',
        'type': 'Organization',
```

'site_admin': False},
 'html_url': 'https://github.com/gems-uff/sapos',
 'description': 'SAPOS main goal is to ease the management of information
related to graduate programs such as enrollments, courses, advisement,
scholarships, requirements, among others.',
 'fork': False,
 'url': 'https://api.github.com/repos/gems-uff/sapos',
 'forks_url': 'https://api.github.com/repos/gems-uff/sapos/forks',
 'keys_url': 'https://api.github.com/repos/gems-uff/sapos/keys{/key_id}',
 'collaborators_url': 'https://api.github.com/repos/gems-
uff/sapos/collaborators{/collaborator}',
 'teams_url': 'https://api.github.com/repos/gems-uff/sapos/teams',
 'hooks_url': 'https://api.github.com/repos/gems-uff/sapos/hooks',
 'issue_events_url': 'https://api.github.com/repos/gems-
uff/sapos/issues/events{/number}',
 'events_url': 'https://api.github.com/repos/gems-uff/sapos/events',
 'assignees_url': 'https://api.github.com/repos/gems-
uff/sapos/assignees{/user}',
 'branches_url': 'https://api.github.com/repos/gems-
uff/sapos/branches{/branch}',
 'tags_url': 'https://api.github.com/repos/gems-uff/sapos/tags',
 'blobs_url': 'https://api.github.com/repos/gems-uff/sapos/git/blobs{/sha}',
 'git_tags_url': 'https://api.github.com/repos/gems-uff/sapos/git/tags{/sha}',
 'git_refs_url': 'https://api.github.com/repos/gems-uff/sapos/git/refs{/sha}',
 'trees_url': 'https://api.github.com/repos/gems-uff/sapos/git/trees{/sha}',
 'statuses_url': 'https://api.github.com/repos/gems-uff/sapos/statuses/{sha}',
 'languages_url': 'https://api.github.com/repos/gems-uff/sapos/languages',
 'stargazers_url': 'https://api.github.com/repos/gems-uff/sapos/stargazers',
 'contributors_url': 'https://api.github.com/repos/gems-uff/sapos/contributors',
 'subscribers_url': 'https://api.github.com/repos/gems-uff/sapos/subscribers',
 'subscription_url': 'https://api.github.com/repos/gems-uff/sapos/subscription',
 'commits_url': 'https://api.github.com/repos/gems-uff/sapos/commits{/sha}',
 'git_commits_url': 'https://api.github.com/repos/gems-
uff/sapos/git/commits{/sha}',
 'comments_url': 'https://api.github.com/repos/gems-
uff/sapos/comments{/number}',
 'issue_comment_url': 'https://api.github.com/repos/gems-
uff/sapos/issues/comments{/number}',
 'contents_url': 'https://api.github.com/repos/gems-uff/sapos/contents/{+path}',
 'compare_url': 'https://api.github.com/repos/gems-
uff/sapos/compare/{base}…{head}',
 'merges_url': 'https://api.github.com/repos/gems-uff/sapos/merges',
 'archive_url': 'https://api.github.com/repos/gems-
uff/sapos/{archive_format}{/ref}',
 'downloads_url': 'https://api.github.com/repos/gems-uff/sapos/downloads',
 'issues_url': 'https://api.github.com/repos/gems-uff/sapos/issues{/number}',
 'pulls_url': 'https://api.github.com/repos/gems-uff/sapos/pulls{/number}',

'milestones_url': 'https://api.github.com/repos/gems-uff/sapos/milestones{/number}',
 'notifications_url': 'https://api.github.com/repos/gems-uff/sapos/notifications{?since,all,participating}',
 'labels_url': 'https://api.github.com/repos/gems-uff/sapos/labels{/name}',
 'releases_url': 'https://api.github.com/repos/gems-uff/sapos/releases{/id}',
 'deployments_url': 'https://api.github.com/repos/gems-uff/sapos/deployments',
 'created_at': '2012-03-14T20:56:25Z',
 'updated_at': '2019-09-25T16:25:29Z',
 'pushed_at': '2019-10-21T19:30:20Z',
 'git_url': 'git://github.com/gems-uff/sapos.git',
 'ssh_url': 'git@github.com:gems-uff/sapos.git',
 'clone_url': 'https://github.com/gems-uff/sapos.git',
 'svn_url': 'https://github.com/gems-uff/sapos',
 'homepage': '',
 'size': 10644,
 'stargazers_count': 18,
 'watchers_count': 18,
 'language': 'Ruby',
 'has_issues': True,
 'has_projects': True,
 'has_downloads': True,
 'has_wiki': True,
 'has_pages': False,
 'forks_count': 11,
 'mirror_url': None,
 'archived': False,
 'disabled': False,
 'open_issues_count': 41,
 'license': {'key': 'mit',
  'name': 'MIT License',
  'spdx_id': 'MIT',
  'url': 'https://api.github.com/licenses/mit',
  'node_id': 'MDc6TGljZW5zZTEz'},
 'forks': 11,
 'open_issues': 41,
 'watchers': 18,
 'default_branch': 'master',
 'permissions': {'admin': False, 'push': False, 'pull': True},
 'organization': {'login': 'gems-uff',
  'id': 1486707,
  'node_id': 'MDEyOk9yZ2FuaXphdGlvbjE0ODY3MDc=',
  'avatar_url': 'https://avatars0.githubusercontent.com/u/1486707?v=4',
  'gravatar_id': '',
  'url': 'https://api.github.com/users/gems-uff',
  'html_url': 'https://github.com/gems-uff',
  'followers_url': 'https://api.github.com/users/gems-uff/followers',

```
    'following_url': 'https://api.github.com/users/gems-
uff/following{/other_user}',
    'gists_url': 'https://api.github.com/users/gems-uff/gists{/gist_id}',
    'starred_url': 'https://api.github.com/users/gems-uff/starred{/owner}{/repo}',
    'subscriptions_url': 'https://api.github.com/users/gems-uff/subscriptions',
    'organizations_url': 'https://api.github.com/users/gems-uff/orgs',
    'repos_url': 'https://api.github.com/users/gems-uff/repos',
    'events_url': 'https://api.github.com/users/gems-uff/events{/privacy}',
    'received_events_url': 'https://api.github.com/users/gems-
uff/received_events',
    'type': 'Organization',
    'site_admin': False},
  'network_count': 11,
  'subscribers_count': 6}
```

O resultado tem diversos resultados e URLs para pegar mais informações. Vamos pegar algumas informações diretas interessantes.

```python
[11]: print("Estrelas:", data["stargazers_count"])
      print("Forks:", data["forks"])
      print("Watchers:", data["subscribers_count"])
      print("Issues abertas:", data["open_issues"])
      print("Linguagem:", data["language"])
```

```
Estrelas: 18
Forks: 11
Watchers: 6
Issues abertas: 41
Linguagem: Ruby
```

Se quisermos saber quem são os colaboradores do projeto e quais são as issues existentes, podemos obter as respectivas URLs.

```python
[12]: print("Colaboradores:", data["contributors_url"])
      print("Issues:", data["issues_url"])
```

```
Colaboradores: https://api.github.com/repos/gems-uff/sapos/contributors
Issues: https://api.github.com/repos/gems-uff/sapos/issues{/number}
```

Agora podemos obter a lista de colaboradores.

```python
[13]: response = requests.get(SITE + "repos/gems-uff/sapos/contributors",␣
      ↪auth=token_auth)
      response.status_code
```

```
[13]: 200
```

```python
[14]: data = response.json()
      data
```

```
[14]: [{'login': 'JoaoFelipe',
        'id': 327789,
        'node_id': 'MDQ6VXNlcjMyNzc4OQ==',
        'avatar_url': 'https://avatars1.githubusercontent.com/u/327789?v=4',
        'gravatar_id': '',
        'url': 'https://api.github.com/users/JoaoFelipe',
        'html_url': 'https://github.com/JoaoFelipe',
        'followers_url': 'https://api.github.com/users/JoaoFelipe/followers',
        'following_url':
    'https://api.github.com/users/JoaoFelipe/following{/other_user}',
        'gists_url': 'https://api.github.com/users/JoaoFelipe/gists{/gist_id}',
        'starred_url':
    'https://api.github.com/users/JoaoFelipe/starred{/owner}{/repo}',
        'subscriptions_url': 'https://api.github.com/users/JoaoFelipe/subscriptions',
        'organizations_url': 'https://api.github.com/users/JoaoFelipe/orgs',
        'repos_url': 'https://api.github.com/users/JoaoFelipe/repos',
        'events_url': 'https://api.github.com/users/JoaoFelipe/events{/privacy}',
        'received_events_url':
    'https://api.github.com/users/JoaoFelipe/received_events',
        'type': 'User',
        'site_admin': False,
        'contributions': 347},
     {'login': 'emoreth',
        'id': 299147,
        'node_id': 'MDQ6VXNlcjI5OTE0Nw==',
        'avatar_url': 'https://avatars0.githubusercontent.com/u/299147?v=4',
        'gravatar_id': '',
        'url': 'https://api.github.com/users/emoreth',
        'html_url': 'https://github.com/emoreth',
        'followers_url': 'https://api.github.com/users/emoreth/followers',
        'following_url':
    'https://api.github.com/users/emoreth/following{/other_user}',
        'gists_url': 'https://api.github.com/users/emoreth/gists{/gist_id}',
        'starred_url': 'https://api.github.com/users/emoreth/starred{/owner}{/repo}',
        'subscriptions_url': 'https://api.github.com/users/emoreth/subscriptions',
        'organizations_url': 'https://api.github.com/users/emoreth/orgs',
        'repos_url': 'https://api.github.com/users/emoreth/repos',
        'events_url': 'https://api.github.com/users/emoreth/events{/privacy}',
        'received_events_url': 'https://api.github.com/users/emoreth/received_events',
        'type': 'User',
        'site_admin': False,
        'contributions': 228},
     {'login': 'bschettino',
        'id': 911556,
        'node_id': 'MDQ6VXNlcjkxMTU1Ng==',
        'avatar_url': 'https://avatars0.githubusercontent.com/u/911556?v=4',
        'gravatar_id': '',
```

         'url': 'https://api.github.com/users/bschettino',
         'html_url': 'https://github.com/bschettino',
         'followers_url': 'https://api.github.com/users/bschettino/followers',
         'following_url':
'https://api.github.com/users/bschettino/following{/other_user}',
         'gists_url': 'https://api.github.com/users/bschettino/gists{/gist_id}',
         'starred_url':
'https://api.github.com/users/bschettino/starred{/owner}{/repo}',
         'subscriptions_url': 'https://api.github.com/users/bschettino/subscriptions',
         'organizations_url': 'https://api.github.com/users/bschettino/orgs',
         'repos_url': 'https://api.github.com/users/bschettino/repos',
         'events_url': 'https://api.github.com/users/bschettino/events{/privacy}',
         'received_events_url':
'https://api.github.com/users/bschettino/received_events',
         'type': 'User',
         'site_admin': False,
         'contributions': 216},
        {'login': 'leomurta',
         'id': 304759,
         'node_id': 'MDQ6VXNlcjMwNDc1OQ==',
         'avatar_url': 'https://avatars2.githubusercontent.com/u/304759?v=4',
         'gravatar_id': '',
         'url': 'https://api.github.com/users/leomurta',
         'html_url': 'https://github.com/leomurta',
         'followers_url': 'https://api.github.com/users/leomurta/followers',
         'following_url':
'https://api.github.com/users/leomurta/following{/other_user}',
         'gists_url': 'https://api.github.com/users/leomurta/gists{/gist_id}',
         'starred_url': 'https://api.github.com/users/leomurta/starred{/owner}{/repo}',
         'subscriptions_url': 'https://api.github.com/users/leomurta/subscriptions',
         'organizations_url': 'https://api.github.com/users/leomurta/orgs',
         'repos_url': 'https://api.github.com/users/leomurta/repos',
         'events_url': 'https://api.github.com/users/leomurta/events{/privacy}',
         'received_events_url':
'https://api.github.com/users/leomurta/received_events',
         'type': 'User',
         'site_admin': False,
         'contributions': 142},
        {'login': 'tiagoamaro',
         'id': 1538066,
         'node_id': 'MDQ6VXNlcjE1MzgwNjY=',
         'avatar_url': 'https://avatars2.githubusercontent.com/u/1538066?v=4',
         'gravatar_id': '',
         'url': 'https://api.github.com/users/tiagoamaro',
         'html_url': 'https://github.com/tiagoamaro',
         'followers_url': 'https://api.github.com/users/tiagoamaro/followers',
         'following_url':

'https://api.github.com/users/tiagoamaro/following{/other_user}',
  'gists_url': 'https://api.github.com/users/tiagoamaro/gists{/gist_id}',
  'starred_url':
'https://api.github.com/users/tiagoamaro/starred{/owner}{/repo}',
  'subscriptions_url': 'https://api.github.com/users/tiagoamaro/subscriptions',
  'organizations_url': 'https://api.github.com/users/tiagoamaro/orgs',
  'repos_url': 'https://api.github.com/users/tiagoamaro/repos',
  'events_url': 'https://api.github.com/users/tiagoamaro/events{/privacy}',
  'received_events_url':
'https://api.github.com/users/tiagoamaro/received_events',
  'type': 'User',
  'site_admin': False,
  'contributions': 120},
 {'login': 'Carlos-Eduardo-Cabral-da-Cunha',
  'id': 20929931,
  'node_id': 'MDQ6VXNlcjIwOTI5OTMx',
  'avatar_url': 'https://avatars1.githubusercontent.com/u/20929931?v=4',
  'gravatar_id': '',
  'url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-Cunha',
  'html_url': 'https://github.com/Carlos-Eduardo-Cabral-da-Cunha',
  'followers_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/followers',
  'following_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/following{/other_user}',
  'gists_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/gists{/gist_id}',
  'starred_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/starred{/owner}{/repo}',
  'subscriptions_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/subscriptions',
  'organizations_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/orgs',
  'repos_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/repos',
  'events_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/events{/privacy}',
  'received_events_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/received_events',
  'type': 'User',
  'site_admin': False,
  'contributions': 113},
 {'login': 'lvieirajr',
  'id': 283394,
  'node_id': 'MDQ6VXNlcjI4MzM5NA==',
  'avatar_url': 'https://avatars0.githubusercontent.com/u/283394?v=4',
  'gravatar_id': '',
  'url': 'https://api.github.com/users/lvieirajr',

```
  'html_url': 'https://github.com/lvieirajr',
  'followers_url': 'https://api.github.com/users/lvieirajr/followers',
  'following_url':
'https://api.github.com/users/lvieirajr/following{/other_user}',
  'gists_url': 'https://api.github.com/users/lvieirajr/gists{/gist_id}',
  'starred_url':
'https://api.github.com/users/lvieirajr/starred{/owner}{/repo}',
  'subscriptions_url': 'https://api.github.com/users/lvieirajr/subscriptions',
  'organizations_url': 'https://api.github.com/users/lvieirajr/orgs',
  'repos_url': 'https://api.github.com/users/lvieirajr/repos',
  'events_url': 'https://api.github.com/users/lvieirajr/events{/privacy}',
  'received_events_url':
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  'type': 'User',
  'site_admin': False,
  'contributions': 89},
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  'id': 1494494,
  'node_id': 'MDQ6VXNlcjE0OTQ0OTQ=',
  'avatar_url': 'https://avatars3.githubusercontent.com/u/1494494?v=4',
  'gravatar_id': '',
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  'html_url': 'https://github.com/braganholo',
  'followers_url': 'https://api.github.com/users/braganholo/followers',
  'following_url':
'https://api.github.com/users/braganholo/following{/other_user}',
  'gists_url': 'https://api.github.com/users/braganholo/gists{/gist_id}',
  'starred_url':
'https://api.github.com/users/braganholo/starred{/owner}{/repo}',
  'subscriptions_url': 'https://api.github.com/users/braganholo/subscriptions',
  'organizations_url': 'https://api.github.com/users/braganholo/orgs',
  'repos_url': 'https://api.github.com/users/braganholo/repos',
  'events_url': 'https://api.github.com/users/braganholo/events{/privacy}',
  'received_events_url':
'https://api.github.com/users/braganholo/received_events',
  'type': 'User',
  'site_admin': False,
  'contributions': 69},
 {'login': 'danielpcampagna',
  'id': 7855757,
  'node_id': 'MDQ6VXNlcjc4NTU3NTc=',
  'avatar_url': 'https://avatars2.githubusercontent.com/u/7855757?v=4',
  'gravatar_id': '',
  'url': 'https://api.github.com/users/danielpcampagna',
  'html_url': 'https://github.com/danielpcampagna',
  'followers_url': 'https://api.github.com/users/danielpcampagna/followers',
  'following_url':
```

'https://api.github.com/users/danielpcampagna/following{/other_user}',
  'gists_url': 'https://api.github.com/users/danielpcampagna/gists{/gist_id}',
  'starred_url':
'https://api.github.com/users/danielpcampagna/starred{/owner}{/repo}',
  'subscriptions_url':
'https://api.github.com/users/danielpcampagna/subscriptions',
  'organizations_url': 'https://api.github.com/users/danielpcampagna/orgs',
  'repos_url': 'https://api.github.com/users/danielpcampagna/repos',
  'events_url': 'https://api.github.com/users/danielpcampagna/events{/privacy}',
  'received_events_url':
'https://api.github.com/users/danielpcampagna/received_events',
  'type': 'User',
  'site_admin': False,
  'contributions': 32},
 {'login': 'rdiasferreira',
  'id': 1541374,
  'node_id': 'MDQ6VXNlcjE1NDEzNzQ=',
  'avatar_url': 'https://avatars0.githubusercontent.com/u/1541374?v=4',
  'gravatar_id': '',
  'url': 'https://api.github.com/users/rdiasferreira',
  'html_url': 'https://github.com/rdiasferreira',
  'followers_url': 'https://api.github.com/users/rdiasferreira/followers',
  'following_url':
'https://api.github.com/users/rdiasferreira/following{/other_user}',
  'gists_url': 'https://api.github.com/users/rdiasferreira/gists{/gist_id}',
  'starred_url':
'https://api.github.com/users/rdiasferreira/starred{/owner}{/repo}',
  'subscriptions_url':
'https://api.github.com/users/rdiasferreira/subscriptions',
  'organizations_url': 'https://api.github.com/users/rdiasferreira/orgs',
  'repos_url': 'https://api.github.com/users/rdiasferreira/repos',
  'events_url': 'https://api.github.com/users/rdiasferreira/events{/privacy}',
  'received_events_url':
'https://api.github.com/users/rdiasferreira/received_events',
  'type': 'User',
  'site_admin': False,
  'contributions': 24},
 {'login': 'bernardocs',
  'id': 513789,
  'node_id': 'MDQ6VXNlcjUxMzc4OQ==',
  'avatar_url': 'https://avatars1.githubusercontent.com/u/513789?v=4',
  'gravatar_id': '',
  'url': 'https://api.github.com/users/bernardocs',
  'html_url': 'https://github.com/bernardocs',
  'followers_url': 'https://api.github.com/users/bernardocs/followers',
  'following_url':
'https://api.github.com/users/bernardocs/following{/other_user}',

```
         'gists_url': 'https://api.github.com/users/bernardocs/gists{/gist_id}',
         'starred_url':
     'https://api.github.com/users/bernardocs/starred{/owner}{/repo}',
         'subscriptions_url': 'https://api.github.com/users/bernardocs/subscriptions',
         'organizations_url': 'https://api.github.com/users/bernardocs/orgs',
         'repos_url': 'https://api.github.com/users/bernardocs/repos',
         'events_url': 'https://api.github.com/users/bernardocs/events{/privacy}',
         'received_events_url':
     'https://api.github.com/users/bernardocs/received_events',
         'type': 'User',
         'site_admin': False,
         'contributions': 7}]
```

1.2.1 Gráfico de Barras

A partir desta lista, podemos fazer um gráfico de barras de contribuições.

```
[15]: contributions = {x["login"]: x["contributions"] for x in data}
      contributions
```

```
[15]: {'JoaoFelipe': 347,
       'emoreth': 228,
       'bschettino': 216,
       'leomurta': 142,
       'tiagoamaro': 120,
       'Carlos-Eduardo-Cabral-da-Cunha': 113,
       'lvieirajr': 89,
       'braganholo': 69,
       'danielpcampagna': 32,
       'rdiasferreira': 24,
       'bernardocs': 7}
```
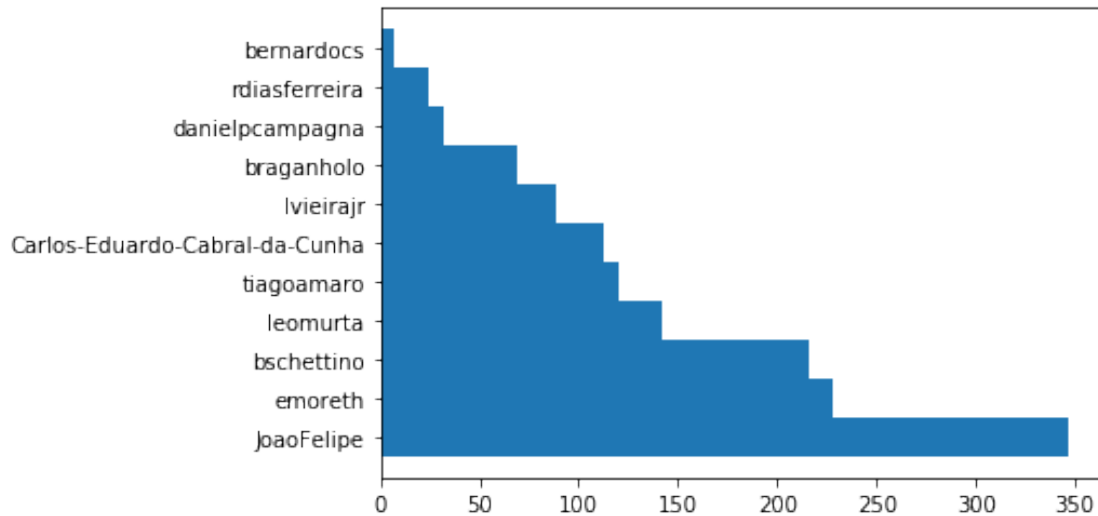
```
[16]: import matplotlib.pyplot as plt
      import numpy as np
      %matplotlib inline
      labels, values = zip(*contributions.items())
      indexes = np.arange(len(labels))
      width = 1
      plt.barh(indexes, values, width)
      plt.yticks(indexes, labels)
      plt.show()
```

Nesse código:

- Importamos `matplotlib` e `numpy` para gerar o gráfico
- Chamamos `%matplotlib inline` para permitir a visualização da figura
- Separamos o dicionário `contributions` em duas listas de `labels` e `values`
- Criamos um `arange` de índices
- Criamos o gráfico de barras horizontal, usando `barh`
- Definimos os ticks de y como sendo os `labels` extraídos anteriormente

Podemos acessar também a url de issues.

```
[17]: response = requests.get(SITE + "repos/gems-uff/sapos/issues", auth=token_auth)
      response.status_code
```

```
[17]: 200
```

```
[18]: data = response.json()
      data
```

```
[18]: [{'url': 'https://api.github.com/repos/gems-uff/sapos/issues/303',
       'repository_url': 'https://api.github.com/repos/gems-uff/sapos',
       'labels_url': 'https://api.github.com/repos/gems-
      uff/sapos/issues/303/labels{/name}',
       'comments_url': 'https://api.github.com/repos/gems-
      uff/sapos/issues/303/comments',
       'events_url': 'https://api.github.com/repos/gems-uff/sapos/issues/303/events',
       'html_url': 'https://github.com/gems-uff/sapos/issues/303',
       'id': 496454487,
       'node_id': 'MDU6SXNzdWU0OTY0NTQ0ODc=',
       'number': 303,
       'title': 'Relatório de prorrogações concedidas',
```

```
  'user': {'login': 'braganholo',
   'id': 1494494,
   'node_id': 'MDQ6VXNlcjE0OTQ0OTQ=',
   'avatar_url': 'https://avatars3.githubusercontent.com/u/1494494?v=4',
   'gravatar_id': '',
   'url': 'https://api.github.com/users/braganholo',
   'html_url': 'https://github.com/braganholo',
   'followers_url': 'https://api.github.com/users/braganholo/followers',
   'following_url':
'https://api.github.com/users/braganholo/following{/other_user}',
   'gists_url': 'https://api.github.com/users/braganholo/gists{/gist_id}',
   'starred_url':
'https://api.github.com/users/braganholo/starred{/owner}{/repo}',
   'subscriptions_url': 'https://api.github.com/users/braganholo/subscriptions',
   'organizations_url': 'https://api.github.com/users/braganholo/orgs',
   'repos_url': 'https://api.github.com/users/braganholo/repos',
   'events_url': 'https://api.github.com/users/braganholo/events{/privacy}',
   'received_events_url':
'https://api.github.com/users/braganholo/received_events',
   'type': 'User',
   'site_admin': False},
  'labels': [],
  'state': 'open',
  'locked': False,
  'assignee': None,
  'assignees': [],
  'milestone': {'url': 'https://api.github.com/repos/gems-
uff/sapos/milestones/11',
   'html_url': 'https://github.com/gems-uff/sapos/milestone/11',
   'labels_url': 'https://api.github.com/repos/gems-
uff/sapos/milestones/11/labels',
   'id': 600835,
   'node_id': 'MDk6TWlsZXN0b25lNjAwODM1',
   'number': 11,
   'title': '4.x',
   'description': 'Features target to version 4. These features are part of the
term project of Everton.',
   'creator': {'login': 'leomurta',
    'id': 304759,
    'node_id': 'MDQ6VXNlcjMwNDc1OQ==',
    'avatar_url': 'https://avatars2.githubusercontent.com/u/304759?v=4',
    'gravatar_id': '',
    'url': 'https://api.github.com/users/leomurta',
    'html_url': 'https://github.com/leomurta',
    'followers_url': 'https://api.github.com/users/leomurta/followers',
    'following_url':
'https://api.github.com/users/leomurta/following{/other_user}',
```

    'gists_url': 'https://api.github.com/users/leomurta/gists{/gist_id}',
    'starred_url':
'https://api.github.com/users/leomurta/starred{/owner}{/repo}',
    'subscriptions_url': 'https://api.github.com/users/leomurta/subscriptions',
    'organizations_url': 'https://api.github.com/users/leomurta/orgs',
    'repos_url': 'https://api.github.com/users/leomurta/repos',
    'events_url': 'https://api.github.com/users/leomurta/events{/privacy}',
    'received_events_url':
'https://api.github.com/users/leomurta/received_events',
    'type': 'User',
    'site_admin': False},
   'open_issues': 18,
   'closed_issues': 25,
   'state': 'open',
   'created_at': '2014-03-17T21:55:19Z',
   'updated_at': '2019-09-20T16:58:50Z',
   'due_on': None,
   'closed_at': None},
  'comments': 0,
  'created_at': '2019-09-20T16:58:50Z',
  'updated_at': '2019-09-20T16:58:50Z',
  'closed_at': None,
  'author_association': 'CONTRIBUTOR',
  'body': 'Deveria ser possível emitir um relatório com as prorrogações
concedidas em um determinado mês, e o SAPOS não tem essa funcionalidade. '},
 {'url': 'https://api.github.com/repos/gems-uff/sapos/issues/302',
  'repository_url': 'https://api.github.com/repos/gems-uff/sapos',
  'labels_url': 'https://api.github.com/repos/gems-
uff/sapos/issues/302/labels{/name}',
  'comments_url': 'https://api.github.com/repos/gems-
uff/sapos/issues/302/comments',
  'events_url': 'https://api.github.com/repos/gems-uff/sapos/issues/302/events',
  'html_url': 'https://github.com/gems-uff/sapos/issues/302',
  'id': 496454224,
  'node_id': 'MDU6SXNzdWU0OTY0NTQyMjQ=',
  'number': 302,
  'title': 'Prorrogações finais concedidas não aparecem na tela de Prorrogações
Concedidas ',
  'user': {'login': 'braganholo',
   'id': 1494494,
   'node_id': 'MDQ6VXNlcjE0OTQ0OTQ=',
   'avatar_url': 'https://avatars3.githubusercontent.com/u/1494494?v=4',
   'gravatar_id': '',
   'url': 'https://api.github.com/users/braganholo',
   'html_url': 'https://github.com/braganholo',
   'followers_url': 'https://api.github.com/users/braganholo/followers',
   'following_url':

'https://api.github.com/users/braganholo/following{/other_user}',
    'gists_url': 'https://api.github.com/users/braganholo/gists{/gist_id}',
    'starred_url':
'https://api.github.com/users/braganholo/starred{/owner}{/repo}',
    'subscriptions_url': 'https://api.github.com/users/braganholo/subscriptions',
    'organizations_url': 'https://api.github.com/users/braganholo/orgs',
    'repos_url': 'https://api.github.com/users/braganholo/repos',
    'events_url': 'https://api.github.com/users/braganholo/events{/privacy}',
    'received_events_url':
'https://api.github.com/users/braganholo/received_events',
    'type': 'User',
    'site_admin': False},
  'labels': [{'id': 1353296,
    'node_id': 'MDU6TGFiZWwxMzUzMjk2',
    'url': 'https://api.github.com/repos/gems-uff/sapos/labels/bug',
    'name': 'bug',
    'color': 'fc2929',
    'default': True}],
  'state': 'open',
  'locked': False,
  'assignee': None,
  'assignees': [],
  'milestone': None,
  'comments': 0,
  'created_at': '2019-09-20T16:58:12Z',
  'updated_at': '2019-09-20T16:58:12Z',
  'closed_at': None,
  'author_association': 'CONTRIBUTOR',
  'body': 'Helio reportou um problema: a tela de prorrogações concedidas não
está mostrando as prorrogações finais concedidas em Julho/2019. Isso é
certamente um bug. Eu reproduzi aqui, ordenando as prorrogações concedidas por
data, e realmente as finais não aparecem. Mas, ao consultar a matrícula de algum
aluno que teve essa prorrogação, ela aparece lá corretamente (exemplo, aluno de
doutorado de matrícula final 214.007). \r\n\r\n'},
 {'url': 'https://api.github.com/repos/gems-uff/sapos/issues/301',
  'repository_url': 'https://api.github.com/repos/gems-uff/sapos',
  'labels_url': 'https://api.github.com/repos/gems-
uff/sapos/issues/301/labels{/name}',
  'comments_url': 'https://api.github.com/repos/gems-
uff/sapos/issues/301/comments',
  'events_url': 'https://api.github.com/repos/gems-uff/sapos/issues/301/events',
  'html_url': 'https://github.com/gems-uff/sapos/issues/301',
  'id': 494334515,
  'node_id': 'MDU6SXNzdWU0OTQzMzQ1MTU=',
  'number': 301,
  'title': 'Erro ao tentar acessar lista_parceiros.html',
  'user': {'login': 'braganholo',

    'id': 1494494,
    'node_id': 'MDQ6VXNlcjE0OTQ0OTQ=',
    'avatar_url': 'https://avatars3.githubusercontent.com/u/1494494?v=4',
    'gravatar_id': '',
    'url': 'https://api.github.com/users/braganholo',
    'html_url': 'https://github.com/braganholo',
    'followers_url': 'https://api.github.com/users/braganholo/followers',
    'following_url':
'https://api.github.com/users/braganholo/following{/other_user}',
    'gists_url': 'https://api.github.com/users/braganholo/gists{/gist_id}',
    'starred_url':
'https://api.github.com/users/braganholo/starred{/owner}{/repo}',
    'subscriptions_url': 'https://api.github.com/users/braganholo/subscriptions',
    'organizations_url': 'https://api.github.com/users/braganholo/orgs',
    'repos_url': 'https://api.github.com/users/braganholo/repos',
    'events_url': 'https://api.github.com/users/braganholo/events{/privacy}',
    'received_events_url':
'https://api.github.com/users/braganholo/received_events',
    'type': 'User',
    'site_admin': False},
  'labels': [{'id': 1353296,
    'node_id': 'MDU6TGFiZWwxMzUzMjk2',
    'url': 'https://api.github.com/repos/gems-uff/sapos/labels/bug',
    'name': 'bug',
    'color': 'fc2929',
    'default': True}],
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  'locked': False,
  'assignee': None,
  'assignees': [],
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uff/sapos/milestones/16',
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    'labels_url': 'https://api.github.com/repos/gems-
uff/sapos/milestones/16/labels',
    'id': 2909994,
    'node_id': 'MDk6TWlsZXN0b25lMjkwOTk5NA==',
    'number': 16,
    'title': '4.4.x',
    'description': '',
    'creator': {'login': 'leomurta',
     'id': 304759,
     'node_id': 'MDQ6VXNlcjMwNDc1OQ==',
     'avatar_url': 'https://avatars2.githubusercontent.com/u/304759?v=4',
     'gravatar_id': '',
     'url': 'https://api.github.com/users/leomurta',
     'html_url': 'https://github.com/leomurta',

    'followers_url': 'https://api.github.com/users/leomurta/followers',
    'following_url':
'https://api.github.com/users/leomurta/following{/other_user}',
    'gists_url': 'https://api.github.com/users/leomurta/gists{/gist_id}',
    'starred_url':
'https://api.github.com/users/leomurta/starred{/owner}{/repo}',
    'subscriptions_url': 'https://api.github.com/users/leomurta/subscriptions',
    'organizations_url': 'https://api.github.com/users/leomurta/orgs',
    'repos_url': 'https://api.github.com/users/leomurta/repos',
    'events_url': 'https://api.github.com/users/leomurta/events{/privacy}',
    'received_events_url':
'https://api.github.com/users/leomurta/received_events',
    'type': 'User',
    'site_admin': False},
   'open_issues': 12,
   'closed_issues': 48,
   'state': 'open',
   'created_at': '2017-11-13T19:42:41Z',
   'updated_at': '2019-10-21T19:50:13Z',
   'due_on': None,
   'closed_at': None},
  'comments': 0,
  'created_at': '2019-09-17T00:03:25Z',
  'updated_at': '2019-09-17T00:03:26Z',
  'closed_at': None,
  'author_association': 'CONTRIBUTOR',
  'body': 'O SAPOS começou a apresentar um erro de acesso de um link que não
existe no sistema. A princípio o erro ocorria sempre com a mesma professora do
IC, mas agora ocorreu também com alguém do PPGEET. É preciso investigar a causa
desse erro. \r\n\r\n=====================\r\n\r\nA CanCan::AccessDenied
occurred in users#show:\r\n\r\n You are not authorized to access this page.\r\n
\r\n-----------------------------\r\nRequest:\r\n----------------------------
--\r\n\r\n * URL   :
https://sapos.ic.uff.br/ppgeet/users/lista_parceiros.html\r\n * IP address:
201.17.86.136\r\n * Parameters: {"controller"=>"users", "action"=>"show",
"id"=>"lista_parceiros", "format"=>"html"}\r\n * Rails root:
/usr/local/sapos/instances/ppgeet'},
 {'url': 'https://api.github.com/repos/gems-uff/sapos/issues/297',
  'repository_url': 'https://api.github.com/repos/gems-uff/sapos',
  'labels_url': 'https://api.github.com/repos/gems-
uff/sapos/issues/297/labels{/name}',
  'comments_url': 'https://api.github.com/repos/gems-
uff/sapos/issues/297/comments',
  'events_url': 'https://api.github.com/repos/gems-uff/sapos/issues/297/events',
  'html_url': 'https://github.com/gems-uff/sapos/issues/297',
  'id': 463331188,
  'node_id': 'MDU6SXNzdWU0NjMzMzExODg=',

```
  'number': 297,
  'title': 'Criar teste spec para o model Query',
  'user': {'login': 'Carlos-Eduardo-Cabral-da-Cunha',
   'id': 20929931,
   'node_id': 'MDQ6VXNlcjIwOTI5OTMx',
   'avatar_url': 'https://avatars1.githubusercontent.com/u/20929931?v=4',
   'gravatar_id': '',
   'url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-Cunha',
   'html_url': 'https://github.com/Carlos-Eduardo-Cabral-da-Cunha',
   'followers_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/followers',
   'following_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/following{/other_user}',
   'gists_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/gists{/gist_id}',
   'starred_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/starred{/owner}{/repo}',
   'subscriptions_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/subscriptions',
   'organizations_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/orgs',
   'repos_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/repos',
   'events_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-da-
Cunha/events{/privacy}',
   'received_events_url': 'https://api.github.com/users/Carlos-Eduardo-Cabral-
da-Cunha/received_events',
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\r\n\r\nAssunto: [SAPOS: Error] course_classes#class_schedule_pdf (TypeError)
"no implicit conversion of Symbol into Integer"\r\n\r\nA TypeError occurred in
course_classes#class_schedule_pdf:\r\n\r\n  no implicit conversion of Symbol
into Integer\r\n  app/controllers/course_classes_controller.rb:89:in `[]\''},
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 'body': 'Na hora de fazer uma alocação de bolsa para um aluno, ao selecionar a
bolsa no combobox, o SAPOS preenche automaticamente a data limite de concessão.
Essa data está sendo calculada de forma errada. Para uma bolsa com início de
alocação em Marco de 2019 ele calcula e preenche o combo de data limite para
Julho de 2015, o que não faz nenhum sentido. A data limite tem que ser a soma da

duração do curso à data de matrícula do aluno (pegar esse valor do campo duração padrão em meses no cadastro do nível correspondente daquela matrícula), ou a data de fim da bolsa, o que for menor. \r\n\r\nExemplo 1: \r\n- data de fim da bolsa = Maio de 2019\r\n- data de matrícula do aluno = Março de 2017 \r\n- nível do aluno = Doutorado\r\n- duração padrão do Doutorado (ver no cadastro de nível) = 48 meses\r\n- data de início da alocação da bolsa de doutorado = Março de 2019 \r\n\r\nNesse exemplo o SAPOS deveria preencher o campo Data Limite de Concessão da alocação de bolsa como Maio de 2019, que é a data de fim da bolsa.\r\n\r\nExemplo 2: \r\n- data de fim da bolsa = NULL\r\n- data de matrícula do aluno = Março de 2017 \r\n- nível do aluno = Doutorado\r\n- duração padrão do Doutorado (ver no cadastro de nível) = 48 meses\r\n- data de início da alocação da bolsa de doutorado = Março de 2019 \r\n\r\nNesse exemplo o SAPOS deveria preencher o campo Data Limite de Concessão da alocação de bolsa como Fevereiro de 2021 (que é Março de 2017 + 48 meses) \r\n\r\n '},

 {'url': 'https://api.github.com/repos/gems-uff/sapos/issues/292',
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   'body': 'Quando tento desligar um aluno usando a tela de edição de matrícula,
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cancelar as inscrições nas disciplinas manualmente. As inscrições nas
disciplinas devem ser canceladas automaticamente ao se trancar uma
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mensagens, para cada alocação: \r\n\r\nPara as 3 alocações da bolsa em questão,
aparece a mensagem: \r\n\r\n- Data Limite de Concessão posterior à data de fim
de bolsa (e essa mensagem não está correta, pois as datas estão consistentes)
\r\n\r\nPara a segunda alocação (e apenas a segunda), aparece a
mensagem:\r\n\r\n- Data de Início da alocação de bolsa deve ser posterior a data
de limite de concessão de uma alocação que não tem data de encerramento
\r\n\r\nAlém disso, em algum momento o SAPOS deixou realizar uma alocação de uma
bolsa que já tinha sido encerrada (CAPESDDS12 encerrada em 2017, e o SAPOS
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significa que não seria mais possível inscrever alunos nessas turmas). \r\n\r\nO
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```

só deve ter permissão de escrita nas turmas das quais é professor. Isso exigiria adicionar uma ligação entre a entidade usuário e a entidade professor \r\n2) Alguns programas não querem ter essa funcionalidade, então isso deveria ser configurável. \r\n'},

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aluno cursou antes como avulso e quer aproveitar os créditos num semestre em que
não está sendo oferecida uma turma daquela disciplina). Nesse caso, a turma
existe apenas para possibilitar esse aproveitamento. Ela portanto não deveria
aparecer no Quadro de Horários. \r\n\r\nAtualmente não há como separar uma turma
de aproveitamento de uma turma regular. Para tratar esse problema, sugiro
adicionarmos um atributo em turma que diga se aquela turma é aproveitamento ou
não. Turmas marcadas como aproveitamento não devem aparecer quando se gera o

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disciplina precisa ser editado para conter "(em inglês)" ao final. Isso é
necessário para que a informação apareça no pdf com o quadro de horários do
semestre. Isso gera efeitos colaterais indesejados, além de não manter o rastro
de qual turma foi em inglês e qual foi em português.\r\n\r\nUma solução mais
adequada seria introduzir um campo "idioma" do tipo String em turma, que tivesse
valor default nulo. Se, para uma dada turma, o valor for diferente de nulo, o

seu valor apareceria tanto no quadro de horários quanto no histórico/boletim dos alunos. \r\n\r\nComo efeito colateral positivo, as combo-boxes que usam record select devem ficar com uma ordenação melhorada. '},
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a janela de foto tenha um tamanho fixo e que seja feito resize da foto para
caber dentro daquele tamanho. Poderia ser o mesmo tamanho que é usado para
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não consegue saber em que coluna cada asterisco está. '},
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Bruno Santos on August, 2016.'},
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graduacao/inscricoes \n\nFormulário de inscrição que usamos no nosso processo
seletivo: http://www.ic.uff.br/images/documentos/pos_graduacao/formularios_e_req
uerimentos/formulario_inscricao.pdf\n\nEssa issue também se relaciona com a
issue #157 (carta de recomendação). \n\nSeria interessante o candidato escolher
se quer preencher o formulário de inscrição em português ou inglês (ou outra
língua). \n'},
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obteve num determinado ano/semestre. O texto da declaração deveria ser editável.
Abaixo vai um exemplo: \n\nDECLARAÇÃO\n\nDeclaro, para os devidos fins, que
FULANO DE TAL cursou como Aluno Avulso \nas seguintes disciplinas do Programa de
Pós-Graduação em Computação, nos termos do Art. 15 \ndo Regulamento dos
Programas de Pós-Graduação Stricto Sensu da Universidade Federal Fluminense.
\n1. Nome da disciplina: "MINERAÇÃO DE DADOS" \n   Carga horaria total: 60 horas
\n   Período: 2015/1\n   Nota: 2,0\n   Situação final: REPROVADO \n2. Nome da
disciplina: "TRATAMENTO DE INCERTEZAS" \n   Carga horaria total: 60 horas \n
Período: 2015/1\n   Nota: 3,5\n   Situação final: REPROVADO\n\nNiterói, 15 de
agosto de 2015\n\n<NOME DO COORDENADOR E CAMPO PARA ASSINATURA> \n\nEssa issue
está totalmente relacionada com o a issue #217.\n'},
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features.',
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term project of Everton.',
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term project of Everton.',
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    'following_url':
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    'gists_url': 'https://api.github.com/users/danielpcampagna/gists{/gist_id}',
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'https://api.github.com/users/danielpcampagna/starred{/owner}{/repo}',
    'subscriptions_url':
'https://api.github.com/users/danielpcampagna/subscriptions',
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  'author_association': 'CONTRIBUTOR',
  'body': 'Na tabela que mostra as inscrições do aluno, na tela de visualização
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\n'},

```
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  'followers_url': 'https://api.github.com/users/braganholo/followers',
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  'node_id': 'MDk6TWlsZXN0b25lNjAwODM1',
  'number': 11,
  'title': '4.x',
```

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     'repos_url': 'https://api.github.com/users/leomurta/repos',
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  'comments_url': 'https://api.github.com/repos/gems-
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```

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  'gists_url': 'https://api.github.com/users/braganholo/gists{/gist_id}',
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  'organizations_url': 'https://api.github.com/users/braganholo/orgs',
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  'labels_url': 'https://api.github.com/repos/gems-
uff/sapos/milestones/11/labels',
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term project of Everton.',
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'https://api.github.com/users/leomurta/starred{/owner}{/repo}',
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    'author_association': 'CONTRIBUTOR',
    'body': 'Ao salvar uma matrícula, verificar se pelo menos um dos orientadores
é credenciado no nível da matrícula do aluno. Exemplo, se a matrícula do aluno é
de nível mestrado, verificar se ele tem PELO MENOS um orientador credenciado
nesse nível. Note que é permitido ter orientador não credenciado no nível, mas
ele não pode ser o orientador principal. \n'},
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    'labels_url': 'https://api.github.com/repos/gems-
uff/sapos/milestones/4/labels',
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    'description': 'Features target to version 5. There is no due date for such
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     'followers_url': 'https://api.github.com/users/braganholo/followers',
     'following_url':
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    'body': 'Permitir que o SAPOS lide com o conceito de currículo. Um currículo
  tem associadas um conjunto de disciplinas (e aí o campo "disciplina do currículo
  vigente" deixa de fazer sentido). Uma matrícula está associada a um único
  currículo. \n'}]
```

[19]:
```python
len(data)
```

[19]: 30

Por padrão, a API retorna 30 itens por página. Dessa forma. a lista retornou apenas a primeira página de issues.

Podemos acessar a segunda página com o parâmetro ?page=2.

[20]:
```python
response = requests.get(SITE + "repos/gems-uff/sapos/issues?page=2",
  ↪auth=token_auth)
response.status_code
```

[20]: 200

[21]:
```python
data2 = response.json()
data2
```

[21]: [{'url': 'https://api.github.com/repos/gems-uff/sapos/issues/174',
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genéricas e servem para qualquer caso. Elas deveriam dizer ao usuário o motivo
do erro. \n\nExemplo: ao tentar cadastrar um desligamento para um aluno que tem
uma bolsa ativa, o erro que aparece é "matrícula não é válida" (ou algo assim).
O que deveria aparecer é "não é possível desligar matrícula que possui bolsa
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fazer uma revisão geral no código e nas mensagens de erro. \n'},
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link:\n\nhttp://inf.ufrgs.br/ppgc/applying/recomenda/en/\n\nO formulário está
disponível em inglês e português. O e-mail que recebi ainda inclui um link onde
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entrada e todas as suas notificações sejam válidas, de modo que não seja
possível alterar uma consulta e deixar notificações que não funcionem no banco
de dados.\n\nPara que isso funcione na página de edição de uma consulta, devem
ser exibidos todas as notificações associadas, essas notificações devem ter seus
atributos editáveis.\n\nQuando uma consulta for alterada, ela possivelmente terá

mais, ou menos, variáveis de entrada e saída. Deve existir um botão no formulário da consulta para atualizar as notificações relacionadas a fim de que se possa colocar esses novos dados de entrada. Assim como também devem ser validados os parâmetros do título e corpo da notificação para garantir que seus parâmetros de saída também estejam corretos.\n'},

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de entradas de dados com os seguintes critérios:\n- Uma query pode ter N
variáveis de entrada.\n - Cada variável de entrada deve ser de um dos tipos :
Numérica, String, Data, DataHora, Hora, Array ou Literal\n   - Numérica: deve
ser validada em inteiro ou float, fazendo as conversões de **'.'** e **','**
quando necessário.\n   - String: Deve ser inserida na query utilizando-se de
aspas, e escapando caracteres especiais do SQL.\n   - Data: Deve ser inserida
em um formato de data aceito pelo banco, com as devidas conversões de data.\n
- DataHora: Deve ser inserida em um formato de data e hora aceito pelo banco,
com as devidas conversões de data e hora.\n   - Hora: Deve ser inserida em um
formato de hora aceito pelo banco, com as devidas conversões de hora.\n   -
Array: Deve conter valores separados por ',' e ser inserida na formatação do IN
(X, Y, Z)\n   - Literal: Deve ser inserido na query do modo como foi definido
pelo usuário, sem tratamento ou verificação.\n - Para os formatos de Data, e
DataHora, devem ser exibidos calendários para que o usuário selecione as datas,
a fim de evitar múltiplos formatos de datas no banco de dados.\n"},

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ser utilizada nesta notificação.\n - Quando uma query for selecionada, a
descrição da query deve ser exibida, para que o usuário saiba qual é o objetivo
da query em questão.\n - Quando uma query for selecionada, deve ser exibido um
botão com a opção de se ver o código SQL da query, somente para referencia. A
query deve vir escondida por padrão.\n - Quando o SQL for exibido, deve estar
no modo read-only\n - Quando uma query for selecionada, devem ser exibidos
quais são os nomes dos parâmetros de retorno dessa query\n - Quando uma query
for selecionada, devem ser exibidos os campos de parâmetros de entrada da query,
para que o usuário possa alterar esses valores (todos usando como placeholder o
valor default definido na query).\n'},
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```

92

```
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features.',
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```

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  'body': 'List (and link) in this page the other system that do more or less
what SAPOS. The term papers of Rodrigo+Tiago and Bruno have some information.
Moreover, also cite this one: http://web.inf.ufpr.br/didonet/sapos-sistema-de-
apoio-a-pos-graduacao\n'},
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uff/sapos/issues/47/labels{/name}',
  'comments_url': 'https://api.github.com/repos/gems-
uff/sapos/issues/47/comments',
  'events_url': 'https://api.github.com/repos/gems-uff/sapos/issues/47/events',
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  'number': 47,
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    'following_url':
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     'color': '0e8a16',
     'default': False},
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```
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  'body': 'O erro acontece na tela de turmas ou na tela de matrículas. Às vezes,
o campo referente ao aluno some da tela de turma (e fica apenas os campos de
disciplina, situação, nota, frequencia e obs). Da mesma forma que isso some,
depois volta, sem que ninguém modifique nada no código. Na tela de matrícula,
quem some é o campo de disciplina, conforme tela abaixo.\n\n![image](https://f.c
loud.github.com/assets/1494494/933133/56528826-0050-11e3-8fde-
fb78f5464ab9.png)\n\nJá notamos que quando o aluno some da tela de turma, se
sairmos da tela, formos até a tela de inscrição, adicionarmos uma inscrição e
depois voltarmos para tela de turma, os alunos reaparecem. Mas não sabemos
explicar o motivo. \n'},
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  'events_url': 'https://api.github.com/repos/gems-uff/sapos/issues/11/events',
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```

```
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    'description': 'Features target to version 5. There is no due date for such
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```

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'https://api.github.com/users/braganholo/subscriptions',
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   'due_on': None,
   'closed_at': None},
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  'closed_at': None,
  'author_association': 'CONTRIBUTOR',
  'body': ''},
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```

'https://api.github.com/users/emoreth/following{/other_user}',
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    'subscriptions_url': 'https://api.github.com/users/emoreth/subscriptions',
    'organizations_url': 'https://api.github.com/users/emoreth/orgs',
    'repos_url': 'https://api.github.com/users/emoreth/repos',
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```
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         'closed_at': None,
         'author_association': 'CONTRIBUTOR',
         'body': '- Permitir consultas complexas (por exemplo, cruzar aluno com bolsa,
aluno com orientador, etc.), e deixar que o usuário possa criar outras consultas
sempre que necessário, salvando-as, sem ter que pedir para os desenvolvedores
implementarem. A consulta poderia ser escrita em SQL via formulário, e salvas
com um nome específico.\n- Teria como rodar as consultas com outro usuário do
BD? Isso permitiria criarmos um usuário no BD com acesso só de leitura, para
evitar efeitos colaterais.\n- Teria como permitir que, ao escrever a consulta,
fossem criadas variáveis? Assim, ao escolher uma consulta para rodar, o usuário
poderia preencher parâmetros que seriam atribuídos a essas variáveis.\n- Seria
interessante fornecer uma possibilidade de gerar o resultado da consulta em pdf,
para facilitar impressão e envio em meio digital.\n'}]
```

[22]:
```
len(data2)
```

[22]: 11

Podemos formar uma lista com todas as issues abertas.

[23]:
```
open_issues = data + data2
```

Essas são apenas as issues abertas. Para pegarmos as issues fechadas, precisamos definir `state=closed`. Podemos aproveitar e definir também `per_page=100` (limite máximo) e fazer um código para pegar todas as páginas.

[24]:
```python
should_continue = True
page = 1
closed_issues = []
while should_continue:
    response = requests.get(SITE + "repos/gems-uff/sapos/issues?
    page={}&per_page=100&state=closed".format(page), auth=token_auth)
    if response.status_code != 200:
        print("Fail:", response.status_code)
        break
    data = response.json()
    closed_issues += data
    if len(data) < 100:
        should_continue = False
    page += 1
len(closed_issues), page - 1
```

[24]: (262, 3)

Foram encontradas 262 issues em 3 páginas.

Agora podemos fazer um gráfico que mostre a evolução de issues abertas ao longo do tempo.

Para fazer esse gráfico, primeiro precisamos combinar as issues e descobrir qual foi a data da issue mais antiga.

```python
[25]: import dateutil.parser

all_issues = open_issues + closed_issues
oldest_issue = min(
    all_issues,
    key=lambda x: dateutil.parser.parse(x["created_at"])
)

oldest_date = dateutil.parser.parse(oldest_issue["created_at"])
oldest_date
```

[25]: datetime.datetime(2013, 6, 29, 15, 23, 48, tzinfo=tzutc())

A partir desta data, podemos criar um range de dias até hoje para ser o nosso índice do gráfico e um array de zeros do **numpy** para acumularmos a quantidade de issues abertas.

```python
[26]: from datetime import datetime, timezone
today = datetime.now(timezone.utc)
delta = today - oldest_date
days = delta.days
print(days)
indexes = np.arange(days)
values = np.zeros(days)
```

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Podemos percorrer todas as issues abertas, incrementando **values** do período em que elas foram abertas até hoje. E podemos percorrer todas as issues fechadas incrementando **values** do período em que elas foram abertas até o período em que elas foram fechadas.

```python
[27]: for issue in open_issues:
    created_at = dateutil.parser.parse(issue["created_at"])
    created_at_index = (created_at - oldest_date).days
    values[created_at_index:] += 1

for issue in closed_issues:
    created_at = dateutil.parser.parse(issue["created_at"])
    created_at_index = (created_at - oldest_date).days

    closed_at = dateutil.parser.parse(issue["closed_at"])
    closed_at_index = (closed_at - oldest_date).days
```
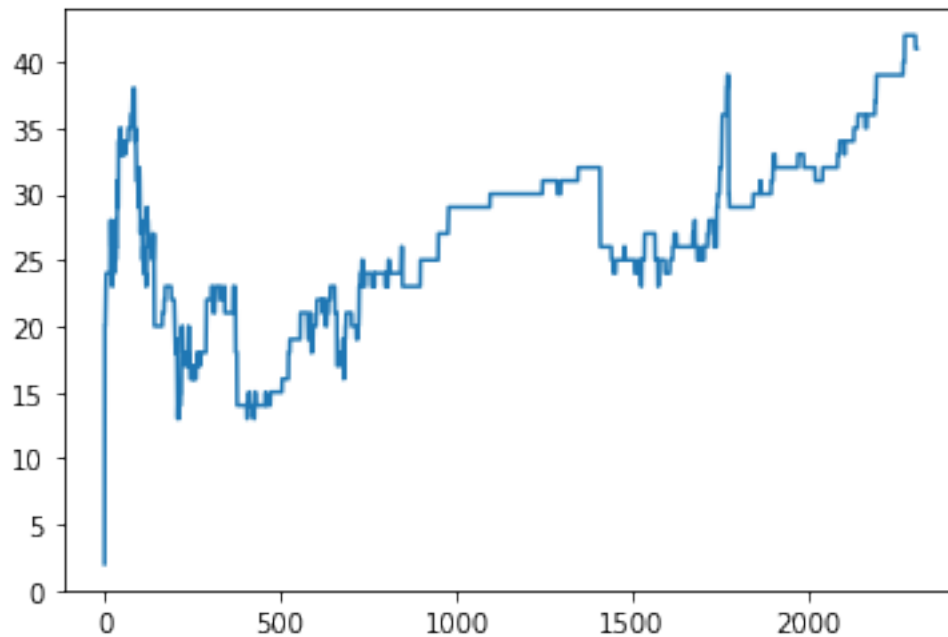
```
    values[created_at_index:closed_at_index] += 1
```

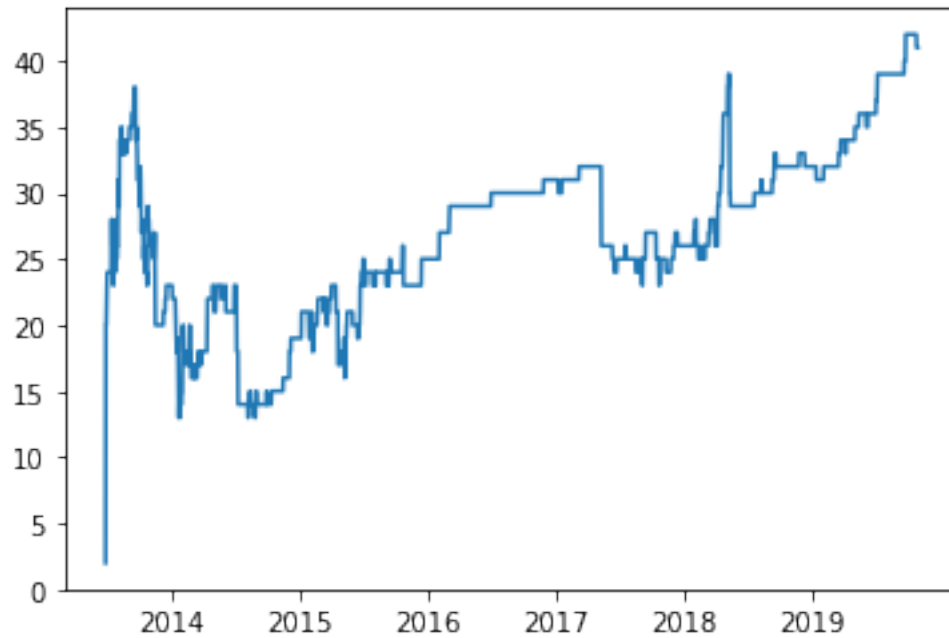Já é possível plotar o gráfico desta forma, mas o entendimento dos eixos ainda não é o ideal.

[28]: `plt.plot(indexes, values)`
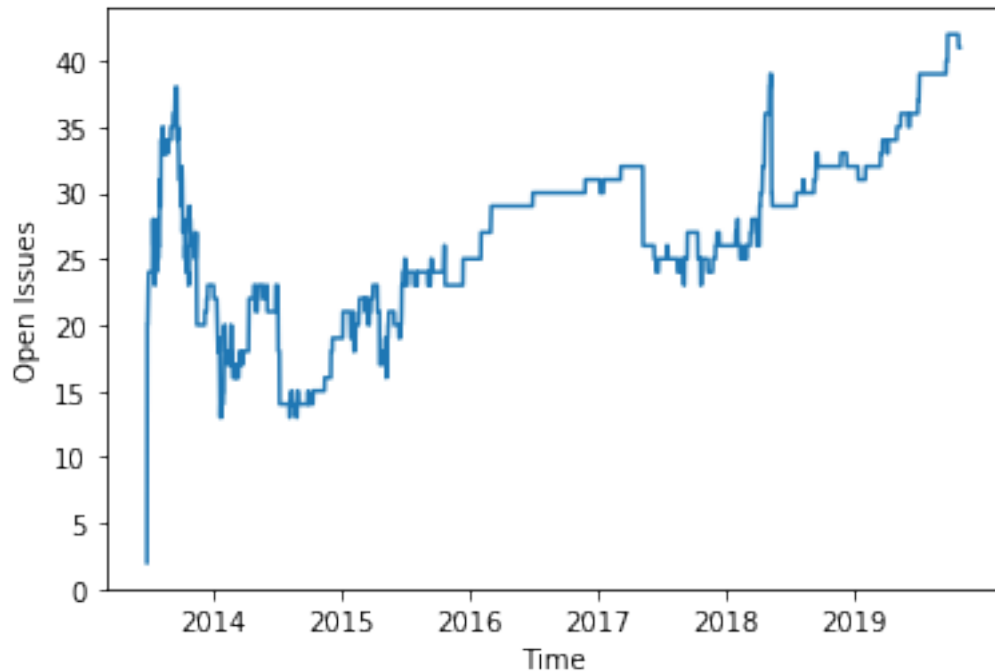
[28]: `[<matplotlib.lines.Line2D at 0x7f20d9b74128>]`

Precisamos definir quais são os anos no eixo x.

[29]:
```python
from math import ceil
labels = [datetime(2013 + i, 1, 1, tzinfo=timezone.utc) for i in␣
 ↪range(ceil(delta.days / 365))]
label_indexes = [(label - oldest_date).days for label in labels]
label_years = [label.year for label in labels]
plt.xticks(label_indexes, label_years)
plt.plot(indexes, values)
plt.show()
```

Também podemos definir o que é cada eixo.

```
[30]: plt.xticks(label_indexes, label_years)
      plt.xlabel("Time")
      plt.ylabel("Open Issues")
      plt.plot(indexes, values)
      plt.show()
```

Issues podem ter diversos labels. Agora vamos fazer um gráfico que mostre barras estacadas com a evolução de cada tipo de issue.

```python
from collections import defaultdict
values = defaultdict(lambda: np.zeros(days))

for issue in open_issues:
    created_at = dateutil.parser.parse(issue["created_at"])
    created_at_index = (created_at - oldest_date).days
    for label in issue["labels"]:
        values[label["name"]][created_at_index:] += 1
    if not issue["labels"]:
        values["no-label"][created_at_index:] += 1

for issue in closed_issues:
    created_at = dateutil.parser.parse(issue["created_at"])
    created_at_index = (created_at - oldest_date).days

    closed_at = dateutil.parser.parse(issue["closed_at"])
    closed_at_index = (closed_at - oldest_date).days
    for label in issue["labels"]:
        values[label["name"]][created_at_index:closed_at_index] += 1
    if not issue["labels"]:
        values["no-label"][created_at_index:closed_at_index] += 1
```
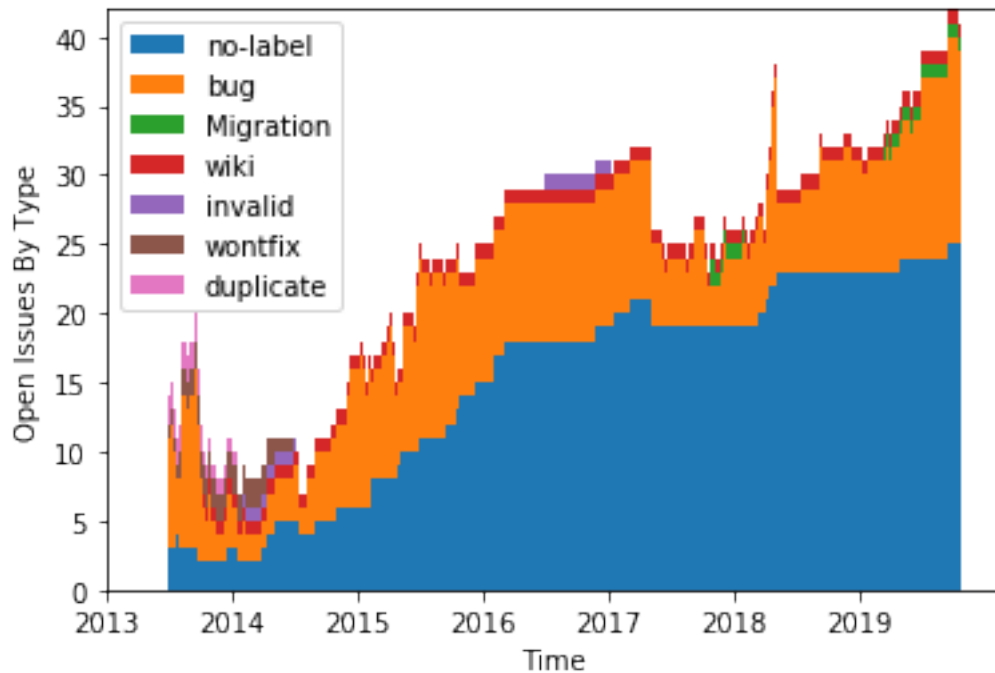
```
[32]: bottom = np.zeros(days)
      legend_color = []
      legend_text = []
      for label, yvalues in values.items():
          if not label[0].isdigit(): # Exclui tags de versões
              ax = plt.bar(indexes, yvalues, 1,
                           bottom=bottom)
              legend_color.append(ax[0])
              bottom += yvalues
              legend_text.append(label)

      plt.xticks(label_indexes, label_years)
      plt.xlabel("Time")
      plt.ylabel("Open Issues By Type")
      plt.legend(legend_color, legend_text)
      plt.show()
```
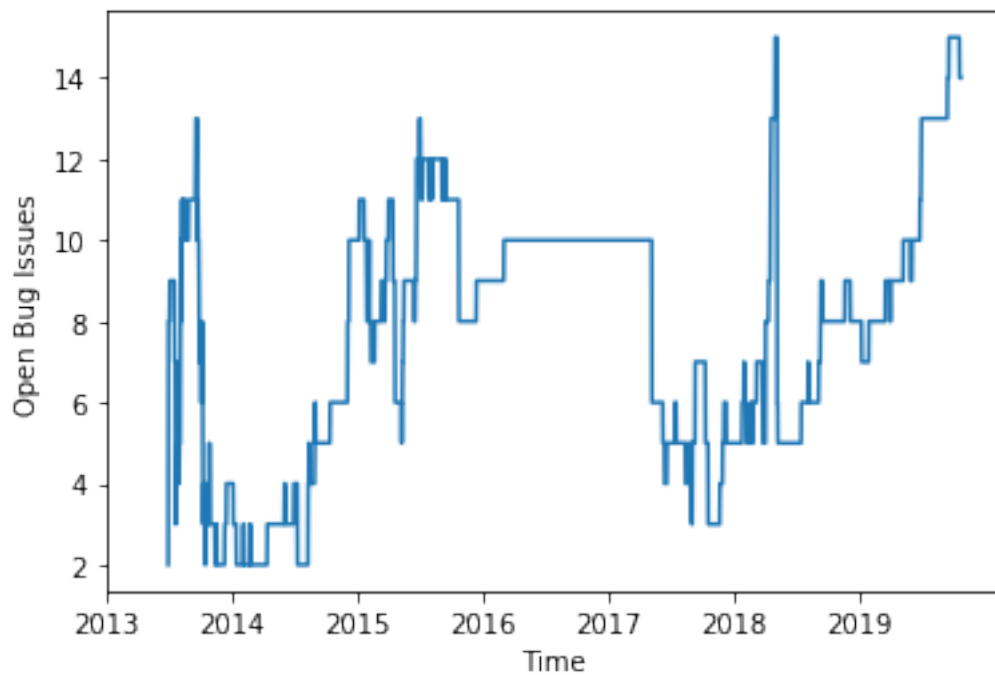

1.3 Exercicio 6

Crie um gráfico de linhas que mostre apenas issues do tipo bug.

```
[33]: ...

      plt.xlabel("Time")
```

```
plt.ylabel("Open Bug Issues")
plt.show()
```
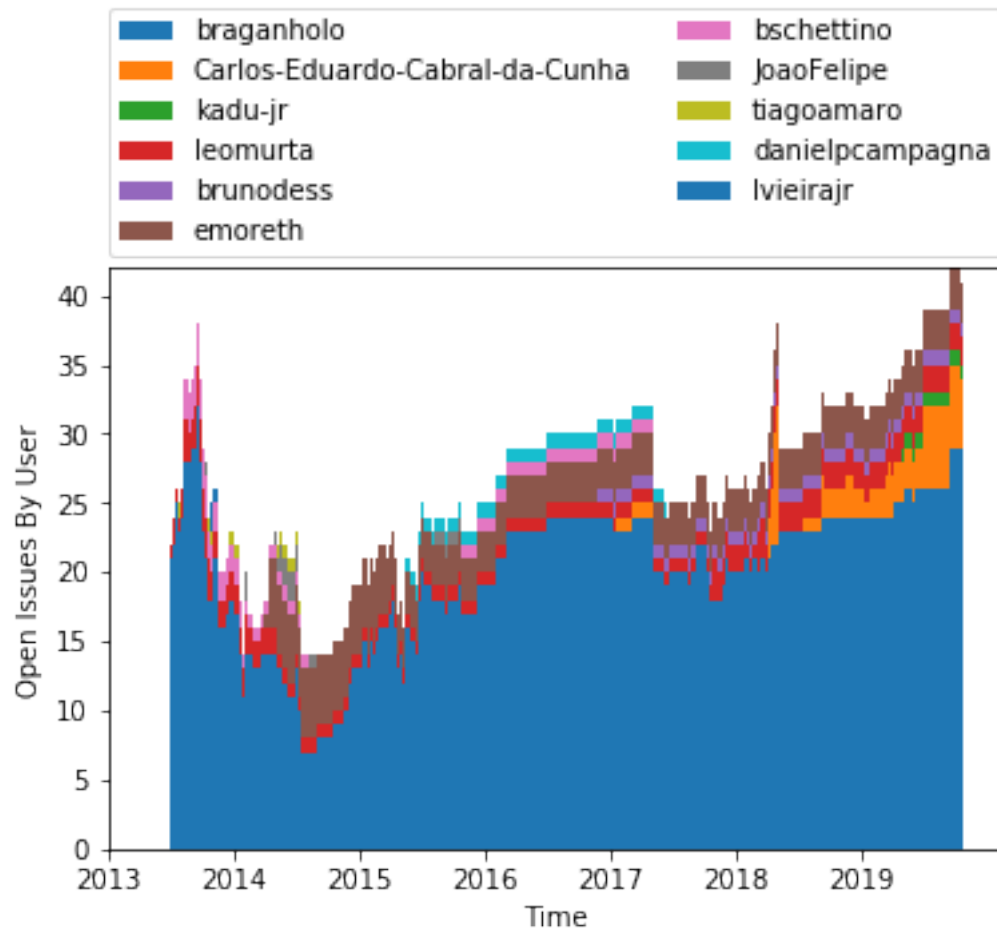

1.4   Exercicio 7

Crie um gráfico de barras para mostrar a participação de usuários em cada issue. Considere o atributo `user`.

[34]: `...`

[35]: `...`

```
plt.xlabel("Time")
plt.ylabel("Open Issues By User")
plt.legend(
    legend_color, legend_text,
    bbox_to_anchor=(0,1.02,1,0.2), loc="lower left",
    mode="expand", borderaxespad=0, ncol=2
)
plt.show()
```

1.5 Exercicio 8

Filtre o gráfico do total de issues abertas para mostrar apenas o ano 2014.
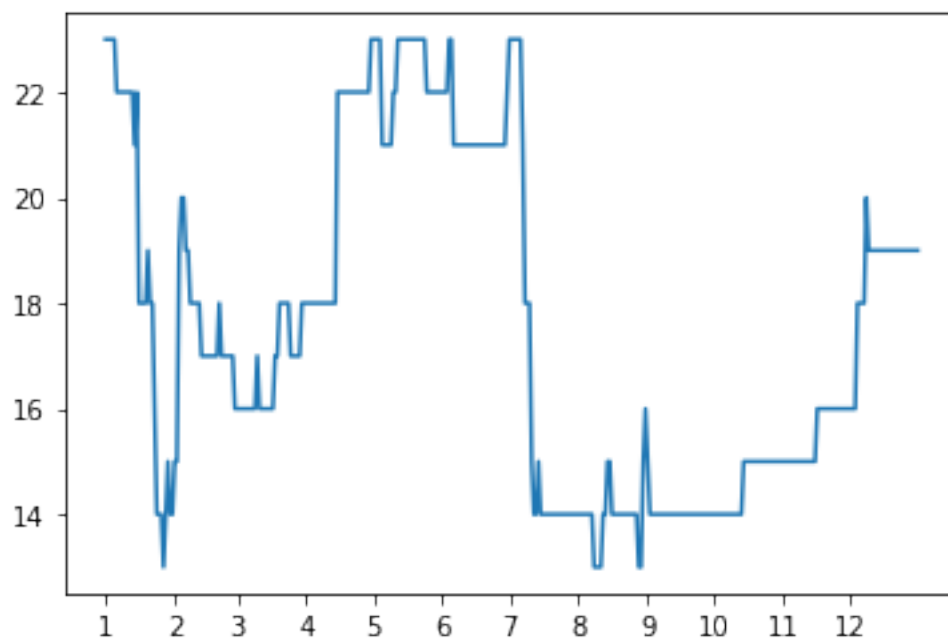
```
[36]: yfirst = datetime(2014, 1, 1, tzinfo=timezone.utc)
      ylast = datetime(2015, 1, 1, tzinfo=timezone.utc)

      deltadays = (ylast - yfirst).days
      values = np.zeros(deltadays)
      indexes = np.arange(deltadays)

      ...
```

```
[37]: labels = [datetime(2014, i + 1, 1, tzinfo=timezone.utc) for i in range(12)]
      label_indexes = [(label - yfirst).days for label in labels]
      label_years = [label.month for label in labels]
      plt.xticks(label_indexes, label_years)
```

```
plt.plot(indexes, values)
plt.show()
```


Continua: