Beyond Basic Programming - Intermediate Python
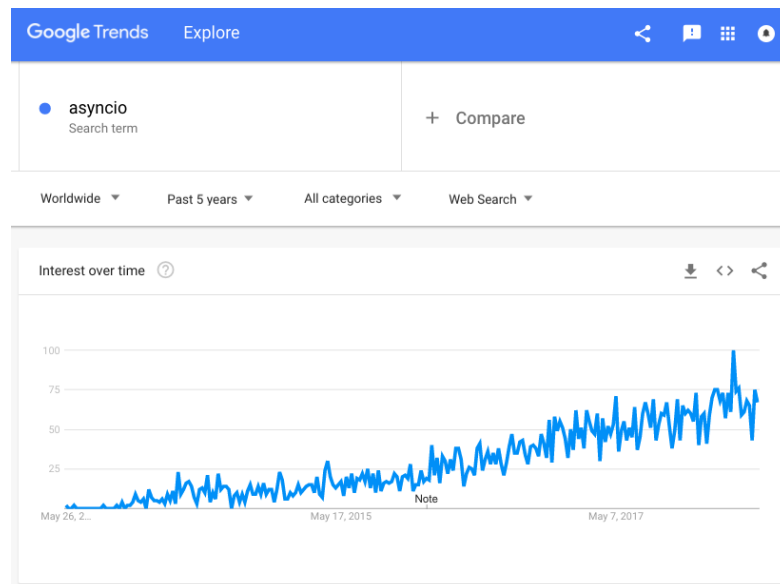
`recluze.net/learn`

Asynchronous Programming (Optional)

It's a growing trend!


```
In [1]:  !pip install aiohttp      # let's install this first
```

```
Requirement already satisfied: aiohttp in /Users/nam/anaconda3/lib/python3.6/site-packages
Requirement already satisfied: attrs>=17.3.0 in /Users/nam/anaconda3/lib/python3.6/site-package
s (from aiohttp)
Requirement already satisfied: idna-ssl>=1.0 in /Users/nam/anaconda3/lib/python3.6/site-package
s (from aiohttp)
Requirement already satisfied: async-timeout<4.0,>=3.0 in /Users/nam/anaconda3/lib/python3.6/si
te-packages (from aiohttp)
Requirement already satisfied: yarl<2.0,>=1.0 in /Users/nam/anaconda3/lib/python3.6/site-packag
es (from aiohttp)
Requirement already satisfied: chardet<4.0,>=2.0 in /Users/nam/anaconda3/lib/python3.6/site-pac
kages (from aiohttp)
Requirement already satisfied: multidict<5.0,>=4.0 in /Users/nam/anaconda3/lib/python3.6/site-p
ackages (from aiohttp)
Requirement already satisfied: idna>=2.0 in /Users/nam/anaconda3/lib/python3.6/site-packages (f
rom idna-ssl>=1.0->aiohttp)
You are using pip version 9.0.1, however version 10.0.1 is available.
You should consider upgrading via the 'pip install --upgrade pip' command.
```

```
In [2]:  gists = ['https://gist.github.com/recluze/1d2989c7e345c8c3c542',
                  'https://gist.github.com/recluze/a98aa1804884ca3b3ad3',
                  'https://gist.github.com/recluze/5051735efe3fc189b90d',
                  'https://gist.github.com/recluze/460157afc6a7492555bb',
                  'https://gist.github.com/recluze/5051735efe3fc189b90d',
                  'https://gist.github.com/recluze/c9bc4130af995c36176d']
```

```
In [3]:  import asyncio
         import aiohttp
```

```
In [ ]:  async def get_gist(url):
             print('GET: ', url)

             async with aiohttp.ClientSession() as session:
                 async with session.get(url) as response:
                     page_text = await response.text()          # Our culprit
                     g_length = len(page_text)
                     print("Len: %d" % g_length)
```

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In [ ]:

In [4]:
```python
async def get_gist(url):                             # Asynchronous
    print('GET: ', url)

    async with aiohttp.ClientSession() as session:   # Asynchronous
        async with session.get(url) as response:     # Asynchronous
            page_text = await response.text()         # Our culprit -- now we only have to define v
            g_length = len(page_text)
            print("Len: %d" % g_length)
            return g_length                           # return value
```

In [5]:
```python
# Set the loop up
asyncio.set_event_loop(asyncio.new_event_loop())    # An event loop runs async tasks
loop = asyncio.get_event_loop()
```

In [6]:
```python
# Add tasks to run
tasks = []
for g in gists:
    future = asyncio.ensure_future(   get_gist(g)   )
    tasks.append(future) # save it for later reference
```

We're not running anything til now!

In [7]:
```python
# Go!
%time loop.run_until_complete(asyncio.wait(tasks))
```

```
GET:  https://gist.github.com/recluze/1d2989c7e345c8c3c542 (https://gist.github.com/recluze/1d2
989c7e345c8c3c542)
GET:  https://gist.github.com/recluze/a98aa1804884ca3b3ad3 (https://gist.github.com/recluze/a98
aa1804884ca3b3ad3)
GET:  https://gist.github.com/recluze/5051735efe3fc189b90d (https://gist.github.com/recluze/505
1735efe3fc189b90d)
GET:  https://gist.github.com/recluze/460157afc6a7492555bb (https://gist.github.com/recluze/460
157afc6a7492555bb)
GET:  https://gist.github.com/recluze/5051735efe3fc189b90d (https://gist.github.com/recluze/505
1735efe3fc189b90d)
GET:  https://gist.github.com/recluze/c9bc4130af995c36176d (https://gist.github.com/recluze/c9b
c4130af995c36176d)
Len: 40539
Len: 228541
Len: 40539
Len: 106614
Len: 43951
Len: 62647
CPU times: user 156 ms, sys: 127 ms, total: 283 ms
Wall time: 2.09 s
```

Out[7]:
```
({<Task finished coro=<get_gist() done, defined at <ipython-input-4-0a555373ce48>:1> result=626
47>,
  <Task finished coro=<get_gist() done, defined at <ipython-input-4-0a555373ce48>:1> result=405
39>,
  <Task finished coro=<get_gist() done, defined at <ipython-input-4-0a555373ce48>:1> result=439
51>,
  <Task finished coro=<get_gist() done, defined at <ipython-input-4-0a555373ce48>:1> result=228
541>,
  <Task finished coro=<get_gist() done, defined at <ipython-input-4-0a555373ce48>:1> result=405
39>,
  <Task finished coro=<get_gist() done, defined at <ipython-input-4-0a555373ce48>:1> result=106
614>},
 set())
```

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```
In [8]:  # Housekeeping
         loop.close()
```

```
In [9]:  tasks[0].result()    # After the loop is done, we can get the return values
```

Out[9]: 228541

```
In [ ]:
```