Marco Bonzanini

Python, Data Science, Text Analytics



Mining Twitter Data with Python (Part 1: Collecting data)

March 2, 2015 · Marco

<u>Twitter</u> is a popular social network where users can share short SMS-like messages called *tweets*. Users share thoughts, links and pictures on Twitter, journalists comment on live events, companies promote products and engage with customers. The list of different ways to use Twitter could be really long, and with 500 millions of tweets per day, there's a lot of data to analyse and to play with.

This is the first in a series of articles dedicated to mining data on Twitter using Python. In this first part, we'll see different options to collect data from Twitter. Once we have built a data set, in the next episodes we'll discuss some interesting data applications.

Update July 2016: my new book on data mining for Social Media is out! Part of the content in this tutorial has been improved and expanded as part of the book, so please have a look. Chapter 2 about mining Twitter is available as a free sample from the publisher's web site, and the companion code with many more examples is available on my GitHub

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 $\label{lem:more updates} \textit{More updates}: fixed version number of Tweepy to avoid problem with Python 3; fixed discussion on _j son to get the JSON representation of a tweet; added example of process_or_store().$

Register Your App

In order to have access to Twitter data programmatically, we need to create an app that interacts with the Twitter API.

The first step is the registration of your app. In particular, you need to point your browser to http://apps.twitter.com, log-in to Twitter (if you're not already logged in) and register a new application. You can now choose a name and a description for your app (for example "Mining Demo" or similar). You will receive a *consumer key* and a *consumer secret*: these are application settings that should always be kept private. From the configuration page of your app, you can also require an access token and an access token secret. Similarly to the consumer keys, these strings must also be kept private: they provide the application access to Twitter on behalf of your account. The default permissions are read-only, which is all we need in our case, but if you decide to change your permission to provide writing features in your app, you must negotiate a new access token.

Important Note: there are rate limits in the use of the Twitter API, as well as limitations in case you want to provide a downloadable data-set, see:

- https://dev.twitter.com/overview/terms/agreement-and-policy
- https://dev.twitter.com/rest/public/rate-limiting

Accessing the Data

Twitter provides <u>REST APIs</u> you can use to interact with their service. There is also <u>a bunch of Python-based clients</u> out there that we can use without re-inventing the wheel. In particular, <u>Tweepy</u> in one of the most interesting and straightforward to use, so let's install it:

```
pip install tweepy==3.3.0
```

Update: the release 3.4.0 of Tweepy has introduced a problem with Python 3, currently fixed on <u>github</u> but not yet available with pip, for this reason we're using version 3.3.0 until a new release is available.

More Updates: the release 3.5.0 of Tweepy, already available via pip, seems to solve the problem with Python 3 mentioned above.

In order to authorise our app to access Twitter on our behalf, we need to use the OAuth interface:

```
import tweepy
     from tweepy import OAuthHandler
3
4
     consumer key = 'YOUR-CONSUMER-KEY'
5
     consumer secret = 'YOUR-CONSUMER-SECRET'
6
     access token = 'YOUR-ACCESS-TOKEN'
     access_secret = 'YOUR-ACCESS-SECRET'
8
     auth = OAuthHandler(consumer_key, consumer_secret)
10
     auth.set_access_token(access_token, access_secret)
12
     api = tweepy.API(auth)
```

The api variable is now our entry point for most of the operations we can perform with Twitter.

For example, we can read our own timeline (i.e. our Twitter homepage) with:

```
for status in tweepy.Cursor(api.home_timeline).items(10):
    # Process a single status
    print(status.text)
```

Tweepy provides the convenient Cursor interface to iterate through different types of objects. In the example above we're using 10 to limit the number of tweets we're reading, but we can of course access more. The status variable is an instance of the Status () class, a nice wrapper to access the data. The JSON response from the Twitter API is available in the attribute json (with a leading underscore), which is not the raw JSON string, but a dictionary.

So the code above can be re-written to process/store the JSON:

```
for status in tweepy.Cursor(api.home_timeline).items(10):
# Process a single status
process_or_store(status._json)
```

What if we want to have a list of all our followers? There you go:

```
for friend in tweepy.Cursor(api.friends).items():
process_or_store(friend._json)
```

And how about a list of all our tweets? Simple:

```
for tweet in tweepy.Cursor(api.user_timeline).items():
process_or_store(tweet._json)
```

In this way we can easily collect tweets (and more) and store them in the original JSON format, fairly easy to convert into different data models depending on our storage (many NoSQL technologies provide some bulk import feature).

The function process_or_store() is a place-holder for your custom implementation. In the simplest form, you could just print out the JSON, one tweet per line:

```
def process_or_store(tweet):
print(json.dumps(tweet))
```

Streaming

In case we want to "keep the connection open", and gather all the upcoming tweets about a particular event, the streaming API is what we need. We need to extend the StreamListener() to customise the way we process the incoming data. A working example that gathers all the new tweets with the #python hashtag:

```
from tweepy import Stream
 2
      from tweepy.streaming import StreamListener
 4
      class MyListener(StreamListener):
 5
 67
        def on_data(self, data):
           try:
 8
             with open('python.json', 'a') as f:
 9
                f.write(data)
10
                return True
11
           except BaseException as e:
12
             print("Error on_data: %s" % str(e))
13
           return True
14
15
        def on_error(self, status):
16
           print(status)
17
           return True
18
19
      twitter_stream = Stream(auth, MyListener())
      twitter_stream.filter(track=['#python'])
```

Depending on the search term, we can gather tons of tweets within a few minutes. This is especially true for live events with a world-wide coverage (World Cups, Super Bowls, Academy Awards, you name it), so keep an eye on the JSON file to understand how fast it grows and consider how many tweets you might need for your tests. The above script will save each tweet on a new line, so you can use the command wc -l python.json from a Unix shell to know how many tweets you've gathered.

You can see a minimal working example of the Twitter Stream API in the following Gist:

twitter stream downloader.py

Summary

We have introduced tweepy as a tool to access Twitter data in a fairly easy way with Python. There are different types of data we can collect, with the obvious focus on the "tweet" object.

Once we have collected some data, the possibilities in terms of analytics applications are endless. In the next episodes, we'll discuss some options.

@MarcoBonzanini

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Pingback: Mining Twitter Data with Python (Part 1: Collecting data) « — was einer so denkt —

Pingback: <u>DataCamp Data Import « — was einer so denkt —</u>



Dear Marco.

How do I get twitters from other users that are not from my time line, that is, in general. It's possible? as? What is the limit of twitters I can get in python at a time.



Reply



Marco

F E B R U A R Y 28, 2017 A T 4:27 P M

Hi Sameque

you can check out an example to get the a user's timeline from my book:

https://github.com/bonzanini/Book-SocialMediaMiningPython/blob/master/Chap02-03/twitter_get_user_timeline.py

The rate limits of the Twitter API are described in their documentation:

https://dev.twitter.com/rest/public/rate-limiting

Cheers

Marco

★ Like

Reply



Rony Armon

MARCH 10, 2018 AT 10:08 AM

Hi Marco, Thanks for the book and scripts

Can you please explain the use of this if loop in the script?

if __name__ == '__main__':

if len(sys.argv) != 2





Kunal

I haven't found a way to get such data.

The official way is to use enterprise API, however, it is really expensive.

There also some services like this

 $\underline{https://www.fiverr.com/data_dealer/provide-all-tweets-of-a-particular-user-historical-data}$

but I haven't tested it yet



Dharshini Jaiganesh

FEBRUARY 16, 2017 AT 5:21 AM

Very useful post. Can you suggest me how to store these retrieved tweets in MYSQL db?

★ Like

Reply



Marco

F E B R U A R Y 28, 2017 A T 4:30 P M

Hi, I haven't worked much on MySQL recently, but recent versions support a JSON data type so you just create a column of type JSON and dump the entire tweet in it. Another option is that you read the JSON and normalise the structure with only the fields that you need.

Cheers,

Marco

★ Like

Reply



HAMZA BOUFTAIH

F E B R U A R Y 20, 2017 A T 11:55 P M

please help!

 $i\,get\,this\,error:$

 $\label{lem:c:/users/Hamza-HP/Desktop/untitled/Tweepy.py", line 24, in process_or_store(status._json) \\ File "C:/Users/Hamza-HP/Desktop/untitled/Tweepy.py", line 18, in process_or_store \\ \end{tabular}$

print(_json.dumps(tweet))

NameError: name '_json' is not defined

but i define json as follow:

import simplejson as json

i don't really know what's wrong:(



Reply



Marco

FEBRUARY 28, 2017 AT 4:32 PM

Hi

if you import simple json as json, you'll need json.dumps(tweet) rather than _json (which is an attribute of status, but not defined in the main space

Cheers

Marco

★ Like

Reply

Pingback: Mining Twitter Data with Tweepy API - Ng Shun Mo Moses' Blog

Pingback: How You Talk To Your Coworkers Vs. How You Talk To Your Friends - Stuff I'm Doing



Vijay Selvakumar

M A R C H 8 , 2 0 1 7 A T 9 : 3 1 A M

How can i see the output of live streaming and how can i save the tweets in hdfs for analysis?



Reply



Marco

M A R C H 1 5 , 2 0 1 7 A T 8 : 1 9 A M

Hi,

in the MyListener.on_data() method you can print() the data instead of (or in addition to) writing to file. For hdfs you'll need an hdfs client but I don't have any particular recommendation here.

Cheers,

Marco



Reply

Pingback: Tracking The Most Popular News Of Mobile World Congress 2017

Pingback: Build A Tweet Bot With Python | Webammer



Nav

 $\mathsf{M} \; \mathsf{A} \; \mathsf{R} \; \mathsf{C} \; \mathsf{H} \quad \mathsf{2} \; \mathsf{8} \; , \quad \mathsf{2} \; \mathsf{0} \; \mathsf{1} \; \mathsf{7} \quad \mathsf{A} \; \mathsf{T} \quad \mathsf{2} \; \colon \mathsf{5} \; \mathsf{3} \quad \mathsf{A} \; \mathsf{M}$

Hey Marco, I'm relatively new to coding and I was trying out your script to see 10 of my twitter feeds but its giving me a UnicodeEncodeError. What else do I need to add to the script that you provided to make this work?



Reply



Hi Nav,

it depends on which line is trowing the error and what the exact error is. The examples are tested in Python 3.4+, so if you're using Python 2 please keep in mind that the string data type is different (unicode in Python 3, non-unicode in Python 2). If that's the case, please consider upgrading to Python 3. Also have a look at this one for more details:

https://wiki.python.org/moin/UnicodeEncodeError

Cheers

Marco

★ Like

Reply



Subhani

Hi

I tried to the Streaming example given above. But unfortunately it gives a syntax error indicating the '&' symbol before 'quote', in "print("Error on_data: %s" % str(e))" line.

How can I get this error fixed?

Thanks in advance!

★ Like

Reply



payungirta

J U L Y 1 9 , 2 0 1 7 A T 1 : 4 5 P M

hi, i got same error.

i just put commend on exception like this:

#print("Error on_data: %s" % str(e))

and put this code on the next line or replace it both working wonderfull:

print ('erorr', str(e))

★ Like

Reply



payungirta

JULY 19, 2017 AT 1:47 PM

pardon i put commend on #print("Error on_data: %s" % str(e))

★ Like



Marco

 $J\ U\ L\ Y\ 1\ 9\ ,\ 2\ 0\ 1\ 7\ A\ T\ 2: 1\ 2\ P\ N$

Hi,

wordpress keeps messing around with quotes and HTML symbols, I think this is fixed now, until it breaks the next time. The symbol should be a regular double quote like this "





Kashf ul Huda

APRIL 5, 2017 AT 5:43 AM

my code shows syntax error in this line: print("Error on_data: %s" % str(e))



Reply



Justin

APRIL 9, 2017 AT 2:46 PM

Hi – can you recommend a hosting platform for a python listener such as this? e.g. a host that will offer everything required and not charge the earth for an "always on" app? Thanks!



Reply



Marco

APRIL 10, 2017 AT 10:09 AM

Hi Justin, in terms of hosting I've only used aws for this, not sure if it fits your requirements. I'm sure there are other options but I don't have a specific recommendation at the moment I'm afraid.

Cheers

Marco



Reply



smile2nil

JUNE 15, 2017 AT 12:11 PM

Hi Marco,

I am interested in knowing more about how to host on aws. Where can i get details?

★ Like



Hello, these days I have saved several tweets with your script.

Today I was watching them and I seem all written by professionals and not by individual.

They are tweets that talk about the weather, news, promotion activities etc...

it's normal? or am I doing something wrong?

For me it would be more useful to analyze the common people tweet, in order to have a vision of what people really think.

Here I have published some are in Italian, but your last name seems Italian: D

https://docs.google.com/document/d/1gYZVnFSpnAYqAEQBWeLJHC6QdpA2koY4i3 mF85Rf7E/edit?usp=sharing



Reply



Jeremy

APRIL 15, 2017 AT 7:45 AM

print("Error on_data: %s" % str(e))

^

SyntaxError: invalid syntax

I keep getting this error running in Andaconda. Could get it to run the 10 post but cant get it to run live stream.

★ Like

Reply



DaX

APRIL 23, 2017 AT 9:00 PN

Tweepy doesn't work anymore.



Reply



Marco

Tweepy 3.5.0 works just fine



Reply



Data Factory (@datafactoryIN)

APRIL 28, 2017 AT 8:58 PM

Hi Marco. I am runnig these codes on my mac. where do the json files get stored?



Reply



Marco

 $\mathsf{M} \ \mathsf{A} \ \mathsf{Y} \quad \mathsf{9} \ , \quad \mathsf{2} \ \mathsf{0} \ \mathsf{1} \ \mathsf{7} \quad \mathsf{A} \ \mathsf{T} \quad \mathsf{7} \ : \ \mathsf{5} \ \mathsf{1} \quad \mathsf{A} \ \mathsf{M}$

Hi

if you use the code as it is, it creates a "python.json" file in the same folder where you're running the script. If you check out the examples from my book you see how the filename is created dynamically.

Cheers,

Marco

★ Like

Reply



Rajan

APRIL 30, 2017 AT 6:58 AM

Hi Marco, is it possible to save the json for each tweet in separate files not appending to python.json?

regards

★ Like

Reply



Marco

M A Y 9 , 2 0 1 7 A T 7 : 5 3 A M

Hi

yes you can come up with the file name dynamically, using a different name every time, for example using the tweet id to ensure the names are unique. Maybe adding the timestamp as well so you can sort them "easily" (you'll end up with too many files)

Cheers

Marco

★ Like

Reply



Lewis

MAY 3, 2017 AT 1:18 PM

hey Marco..how can i filter the tweets about political views in a certain country like for Zambia only..reply asap...



The filter method also takes a "locations" argument. It has to follow the format as described here:

https://dev.twitter.com/streaming/overview/request-parameters#locations

You can only pass the coordinates as a box so I don't think you can explicitly specify the country. Also, only a small number of tweets come with geolocation information.

Cheers

Marco

★ Like

Reply



Hi Marco, I have read that one can only stream based on a keyword or location but not both. Does that sound right to you? thanks

★ Like



Marco

2 0 1 7

Hi Leo,

you can pass keywords (track), user IDs (follow) and locations, but they will be put in logical OR, as described here https://dev.twitter.com/streaming/reference/post/statuses/filter

★ Like



sanyam09

2 0 1 7

Hi

Actually I have to do sentiment analysis and for that purpose I need to collect some Twitter data so can you please tell how to we get consumer I'd and consumer secret mentioned in your tutorials first part.

How the application will be set up?

★ Like

Reply

Pingback: What Happened on Twitter During the Champions League Final | Open Data Science

Pingback: Hoc BigData (BD) - Ngày 8 - Anhnt1289



HI Marco, I really enjoy reading your blogs and attending meetups you speak at. I am trying to collect a year's worth twitter data from the current date based on selected keywords. I've used the twitter search API but it only seems to give me 12 days worth results (around 3000 tweets) for a keyword. Would I be able to get results from a longer period using tweepy (ideally I would like to specify the start and end date for my search)? or would I need to subscribe to Twitter Firehouse?

Best Wishes

Ryan

★ Like

Reply



Pat

JULY 30, 2017 AT 2:17 AM

Dear Marco,

i hope you can help me out.

I sucessfully set up tweepy and now i wanna get the latest trends for a specific place (set by woeid) as a list and not more than 10 trends. I wish i could do that myself but i'm a complete douche.

best regrets.

★ Like

Reply



Marco

A U G U S T 2 , 2 0 1 7 A T 3 : 3 5 P M

Hi Pat

I haven't used the twitter trend API, but this is the endpoint to check out

https://dev.twitter.com/rest/reference/get/trends/place

In Tweepy, this translated to a call to api.trends_place(woeid) — as far as I can see, you have to pass one woeid at a time

Cheers,

Marco

★ Like

Reply



Pat

AUGUST 9, 2017 AT 11:16 AM

thank you for your reply. I was able to solve my wish by using snippets, examples and tutorials.

Cheers,

★ Like

Pat

Pingback: RESOURCES - KARTHICK PHILLIP NAGARAJAN



yousufmotiwala

AUGUST 19, 2017 AT 3:49 PM

Hi!

i got this error, can you help me out
Traceback (most recent call last):
File "C:\Users\YousufM\Desktop\abc.py", line 17, in
process_or_store(status._json)
NameError: name 'process_or_store' is not defined

my code was this for status in tweepy.Cursor(api.home_timeline).items(10): # Process a single status process_or_store(status._json)

★ Like

Reply



Marco

A U G U S T 2 9 , 2 0 1 7 A T 8 : 1 6 A M

Hi

you need to defined the function as described at the end of the paragraph (as an example, there's a simple implementation that prints out the json), you'll have to implement it depending on your needs (print it, store it on DB, etc.)

Cheers,

Marco

★ Like

Reply



Milton Teixeira

SEPTEMBER 5, 2017 AT 4:31 PM

How do we do that? oO

★ Like



Hi Milton, this is the simplest possible implementation as included in the article:

def process_or_store(tweet): print(json.dumps(tweet))

This will simply print the JSON on the screen. If you want to store it on file you can re-use the example from my book: https://github.com/bonzanini/Book-SocialMediaMiningPython/blob/master/Chap02-03/twitter-get-user-timeline.py

Cheers,

Marco

★ Like



Dani

S E P T E M B E R 4 , 2 0 1 7 A T 9 : 1 8 A M

Hi Marco.

I am a student assisting a professor who wants to analyze twitter behavior of Dutch politicians (most of which have a public twitter profile) during the elections. To do this, I want to construct a database with the following information:

Per politician (about 300 in total), how many original tweets / retweets / replies they sent per day, for all days in the period 01/01/2017 - 03/31/2017. I have no experience with programming whatsoever (I do like math and working with Excel / statistic software).

Currently, I am doing this all manually (counting by scrolling through their timelines and putting all information in Excel). As you can imagine, this takes ages, and I suspect that it might be possible to do it so much quicker. Besides, learning (the basics of) programming has been on my wishlist for a long time.

However, I would like to know if it is likely that there is a 'programming solution' for this problem at all or that due to privacy/request limitations it will not be worth to devote all these hours to learning because it won't work anyway. With all your experience: Do you think this is possible? Or might I just as well continue counting?

Best,

Dani

★ Like

Reply



Marco

S E P T E M B E R 8 , 2 0 1 7 A T 3 : 5 2 P M

Hi Dani

there are several limitations imposed by the Twitter API, but there are definitely some workarounds. If you're tracking a specific account, you can retrieve up to 3,200 of its most recent tweets using this method

(https://dev.twitter.com/rest/reference/get/statuses/user_timeline). An example of implementation using Python is in my book (https://github.com/bonzanini/Book-SocialMediaMiningPython/blob/master/Chap02-

<u>O3/twitter get user timeline.py</u>). On top of the limitation given by the total number of tweets that you can retrieve with this approach, there is also a rate limit (described in the Twitter API link above), so retrieving a lot of data will likely

require some time just because you need to pause the requests (they don't let you hammer the API). If a user tweets a lot, you're unlikely to be able to capture a specific time window in the past because you can only retrieve the most recent 3,200 tweets.

On the other side, for upcoming tweets, you can keep the stream open and track the activity of specific accounts, using the Streaming API as described in this tutorial. The only difference is that you'd use the option "follow" to spell out the user names you want to include in the stream, rather than "track" that is used for keywords. This second approach will require an always-on server and possibly additional configuration to monitor the stream.

As a starting point you can use the user_timeline script from my book (link above) and try it with a few usernames.

Best wishes for your research, I hope this helps.

Cheers,

Marco



Reply



Olawunmi Shyllon

O C T O B E R 2 8 , 2 0 1 7 A T 6 : 0 7 P M

Hello,

Thank you for the great job you have done. I tried the code and it works with a single term but when I tried using multiple terms for track term I got errors. How do I modify this code "python twitter_stream_download.py -q apple -d data" to account for the change of terms. Thank you

Ola



Reply



Marco

N O V E M B E R 13, 2017 A T 2:31 P M

Hi Ola

you can use double quotes around your query, and all the query terms will be passed to the API, for example:

python twitter_stream_download.py -q "apple football" -d data

this will query the API for "apple AND football"

otherwise with:

python twitter_stream_download.py -q "apple, football" -d data

using the comma between keyword is equivalent to an OR query (in this case, apple OR football)

It's always worth checking out the official docs in case the API changes in the future

https://developer.twitter.com/en.html

Cheers

Marco





Hi.

I tried the codes and it works very well but i want to store tweets using utf-8 encoding. How can i store tweets to json file with using utf-8 encoding? Thank you.

★ Liked by 1
person

Reply



varunbike

NOVEMBER 17, 2017 AT 4:45 AM

This is Truly a masterpiece .Very much explained and clear in meaning . I followed this and working fine .

Is there any way we can get rid of "tweepy.error.TweepError: Twitter error response: status code = 429"? I searched this in google but not much help I got. I put this in tweepy github page but the response redirecting me to twitter Rate Limit page. I have seen many online application available which are making much more request than what I am trying to do.

Any help in this regard is highly appreciated.

Thank you.

★ Like

Reply



chrisra

JANUARY 9, 2018 AT 1:28 PM

Dear Marco, thank you for this tutorial and your book, which is really great and addictive:)

I have collected quite a lot of tweets so far and tried different analyses.

Now would like to convert my json-Tweets into a csv-format but am struggling for some reasons. Could you give an example on how to do that based on your example here?

I am interested in the conversion of existing json-files with data collected from twitter, as well as in how to store twitter streaming data in csv as they directly come out of the stream.

I would appreciate your help very much!

Thank you

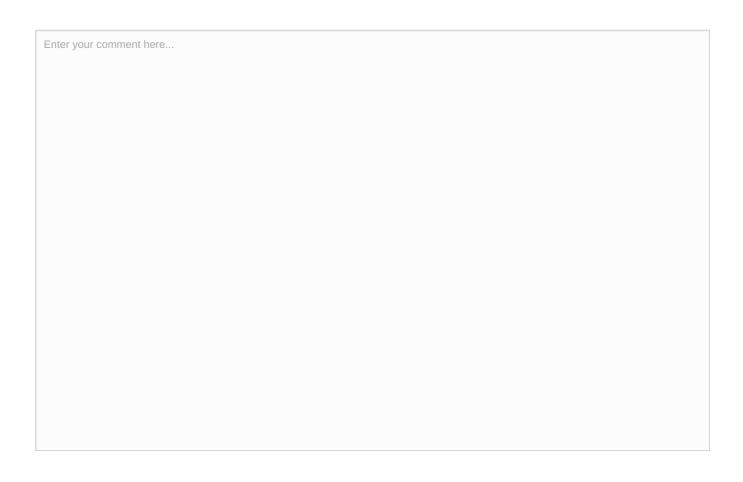
★ Like

Reply



"cannot import name 'OAuthHandler' "
★ Like
<u>Reply</u>
miladkordeh FEBRUARY 16, 2018 AT 9:05 PM
Hi, Where do I need to run pip install tweepy==3.3.0????
★ Like
<u>Reply</u>
miladkordeh FEBRUARY 16, 2018 AT 9:11 PM
Please ignore my question I got it: CMD
★ Like
<u>Reply</u>
anubhav MARCH 14, 2018 AT 3:58 PM
Hello,
I tried extracting historical tweets. Could you please provide any suggestion on this question:

Leave a Reply



Follow@marcobonzanini

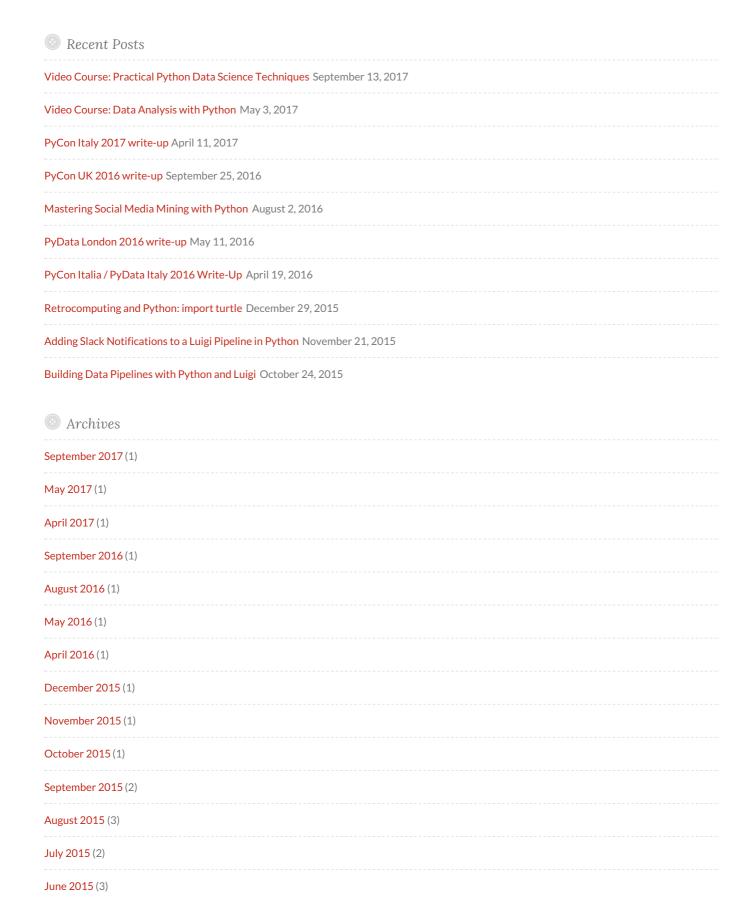




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