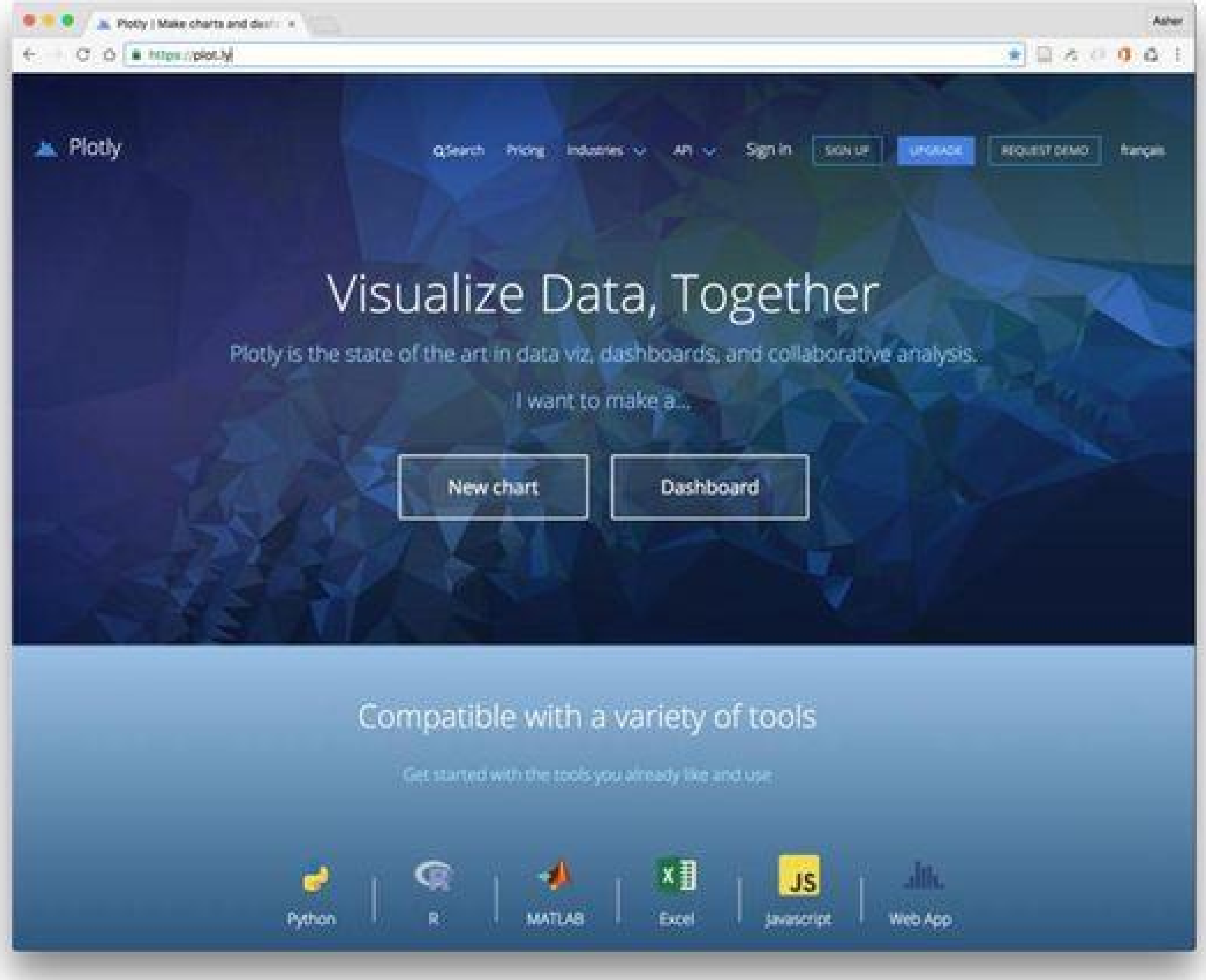
Getting Started with Plot.ly



Visualize Data, Together

Plotly is the state of the art in data viz, dashboards, and collaborative analysis.

I want to make a...

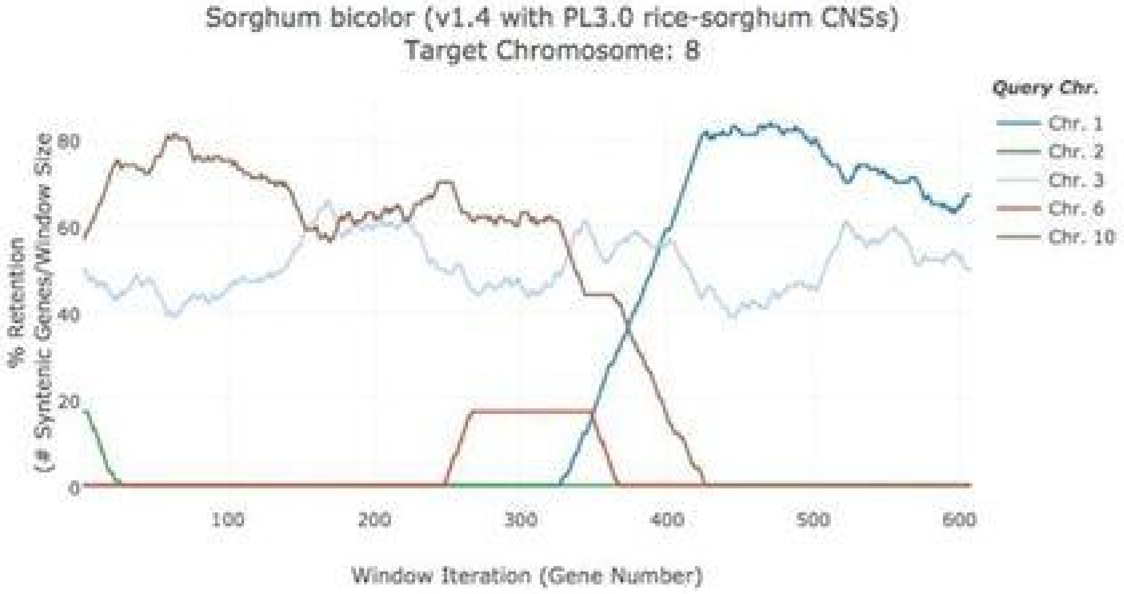
Compatible with a variety of tools

Get started with the tools you already like and use

What IS Plot.ly?

Plot.ly is an open-source* data visualization tool.

… was built using **Python** (Django) & JavaScript.
… offers a web application for **visualization** & **analysis**.
… provides plotting **APIs** for many popular languages.
… plots are **fully interactive**, and rendered with D3.js or WebGL (for 3D).
… free, paid, and on-site offerings.



* well, *mostly* open-source.

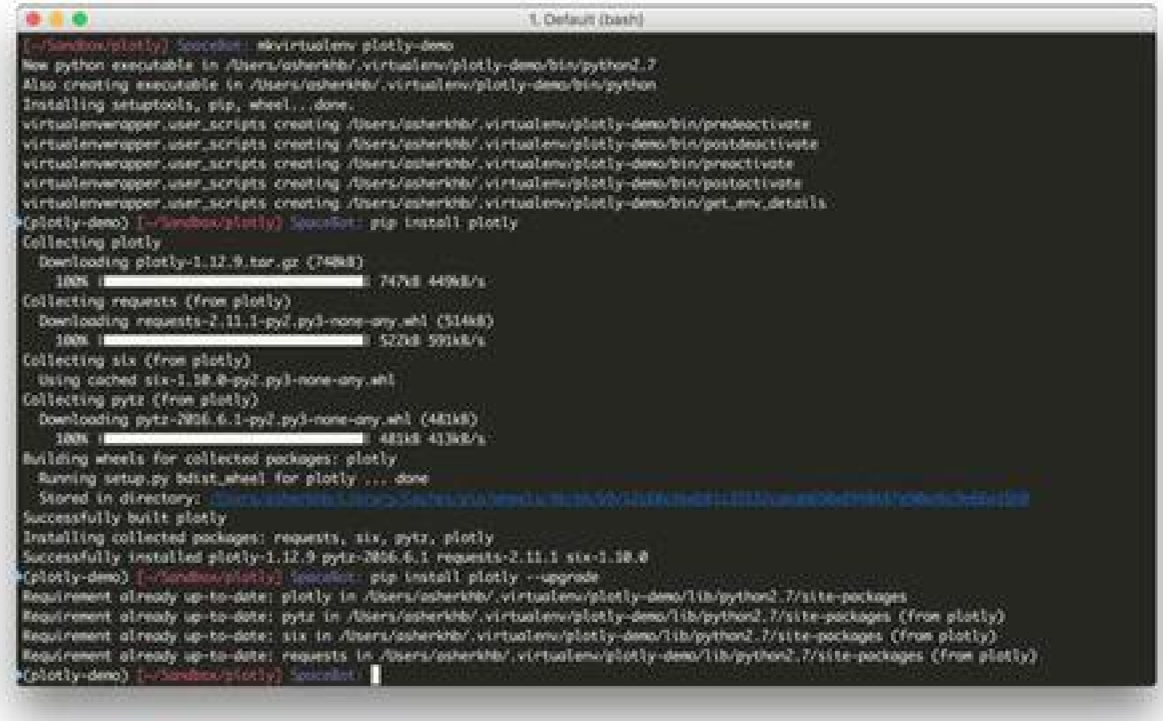
Step 1: *Install Plotly Python Package*

Installing is easy...just use PIP!

```
(sudo) pip install plotly
```

Updating is also easy...YAY!

```
(sudo) pip install plotly --upgrade
```



```
[~/Sandbox/plotly] SpaceBot: mkvirtualenv plotly-demo
New python executable in /Users/osherkhb/.virtualenv/plotly-demo/bin/python2.7
Also creating executable in /Users/osherkhb/.virtualenv/plotly-demo/bin/python
Installing setuptools, pip, wheel...done.
virtualenvwrapper.user_scripts creating /Users/osherkhb/.virtualenv/plotly-demo/bin/predeactivate
virtualenvwrapper.user_scripts creating /Users/osherkhb/.virtualenv/plotly-demo/bin/postdeactivate
virtualenvwrapper.user_scripts creating /Users/osherkhb/.virtualenv/plotly-demo/bin/preactivate
virtualenvwrapper.user_scripts creating /Users/osherkhb/.virtualenv/plotly-demo/bin/postactivate
virtualenvwrapper.user_scripts creating /Users/osherkhb/.virtualenv/plotly-demo/bin/get_env_details
(plotly-demo) [~/Sandbox/plotly] SpaceBot: pip install plotly
Collecting plotly
  Downloading plotly-1.12.9.tar.gz (740kB)
    100% |████████████████████████████████| 747kB 449kB/s
Collecting requests (from plotly)
  Downloading requests-2.11.1-py2.py3-none-any.whl (514kB)
    100% |████████████████████████████████| 522kB 591kB/s
Collecting six (from plotly)
  Using cached six-1.10.0-py2.py3-none-any.whl
Collecting pytz (from plotly)
  Downloading pytz-2016.6.1-py2.py3-none-any.whl (481kB)
    100% |████████████████████████████████| 481kB 413kB/s
Building wheels for collected packages: plotly
  Running setup.py bdist_wheel for plotly ... done
  Stored in directory: [illegible]
Successfully built plotly
Installing collected packages: requests, six, pytz, plotly
Successfully installed plotly-1.12.9 pytz-2016.6.1 requests-2.11.1 six-1.10.0
(plotly-demo) [~/Sandbox/plotly] SpaceBot: pip install plotly --upgrade
Requirement already up-to-date: plotly in /Users/osherkhb/.virtualenv/plotly-demo/lib/python2.7/site-packages
Requirement already up-to-date: pytz in /Users/osherkhb/.virtualenv/plotly-demo/lib/python2.7/site-packages (from plotly)
Requirement already up-to-date: six in /Users/osherkhb/.virtualenv/plotly-demo/lib/python2.7/site-packages (from plotly)
Requirement already up-to-date: requests in /Users/osherkhb/.virtualenv/plotly-demo/lib/python2.7/site-packages (from plotly)
(plotly-demo) [~/Sandbox/plotly] SpaceBot:
```

Sidenote...BOO!

Plot.ly recommends "frequently updating" the package, as they tend to release new features/bug fixes ~1x per week.

Personally, I recommend doing this in a virtual environment, just in case one of these updates would break your code.

Step 2: *Setup your API keys*

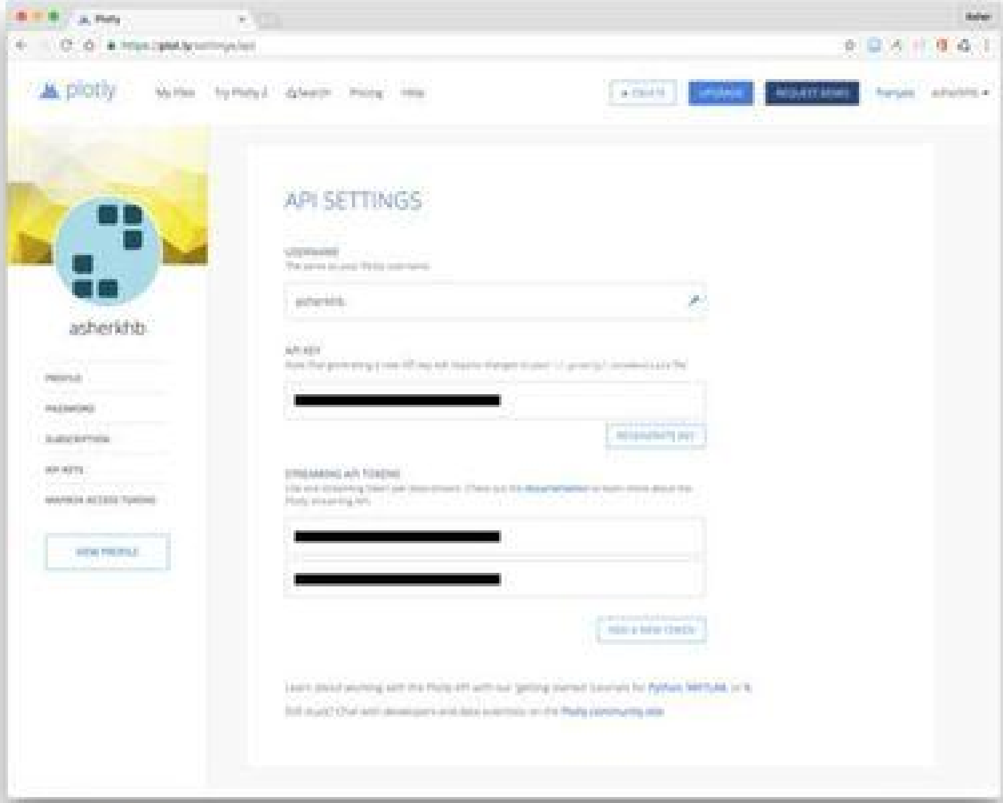
...these are necessary for communicating with Plot.ly's servers.

Question: *What is an API?*
Answer: *An "Application Programming Interface"*

Question: *...?*
Slightly More Useful Answer: *A way to interact with someone else's program, using programming languages rather than a graphical user interface*

```
In [1] import plotly
In [2] plotly.tools.set_credentials_file( \
         username='YourAccount', \
         api_key='YourKey')
```

NOTE: *You only need to do this once on your computer account, even if you use different virtual environments.*



API SETTINGS

USERNAME

asherkhb

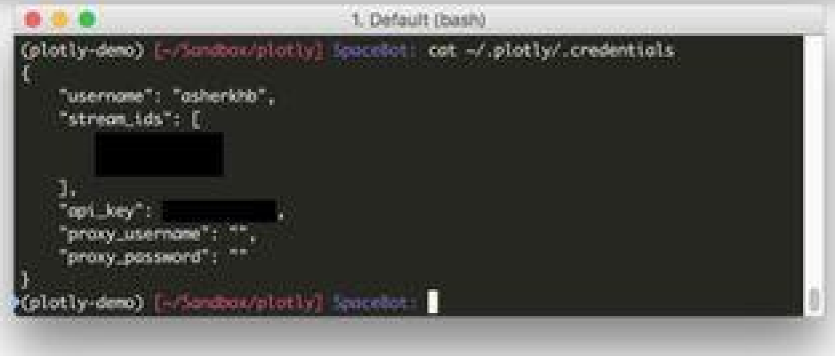
API KEY

[redacted]

STREAMING API TOKENS

[redacted]

[redacted]



```
1. Default (bash)
(plotly-demo) [~/Sandbox/plotly] SpaceBot: cat ~/.plotly/.credentials
{
    "username": "asherkhb",
    "stream_ids": [
        [redacted]
    ],
    "api_key": [redacted],
    "proxy_username": "",
    "proxy_password": ""
}
(plotly-demo) [~/Sandbox/plotly] SpaceBot: 
```

Step 3: *Compose a Plot*

Figure() - The Plotly “Plot” Object

Composed of two parts: ‘Data’ and ‘Layout’

Data()

Contains the information to be plotted.

Composed of ‘trace’s

Layout()

Contains information about the plot

i.e. title, labels, fonts, annotations, etc.

Figure()

Combines Data() and Layout()

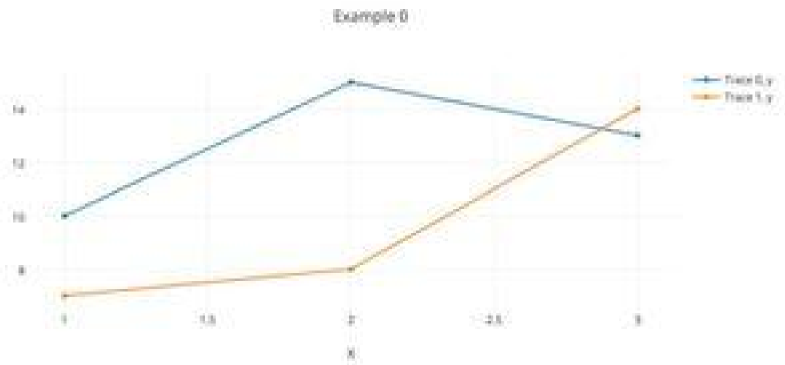
```
import plotly.plotly as py
from plotly.graph_objs import *

trace0 = Scatter(x=[1, 2, 3],y=[10, 15, 13])
trace1 = Scatter(x=[1, 2, 3],y=[7, 8, 14])
my_data = Data([trace0, trace1])

my_layout = Layout(
    title="Example 0",
    xaxis=dict(title="X"))

my_figure = Figure(
    data=my_data, layout=my_layout)

py.plot(my_figure, filename='example0')
```



https://plot.ly/~asherkhb/462/example-0/

Step 4: *Let's Plot!!*

Online

```
import plotly.plotly as py
```

Python

```
py.plot()
```

iPython

```
py.iplot()
```

Offline

```
import plotly.offline as pyo
```

Python

```
pyo.plot()
```

iPython

```
pyo.iplot()
```

Online vs **Offline** Plotting

Online Plotting

- Data is sent to Plotly's servers, plots are generated and links are returned.
- Embedded plots can be returned to iPython.

Pros

- Ability to adjust look of plots using GUI.
- Easy to share plots with other users.

Cons

- Internet connection required, need to set up API keys.
- Data is public (unless Pro account).

Offline Plotting

- Data is bundled with Plotly's library locally, made available as local .html files or divs.
- Embedded plots are available when using iPython.

Pros

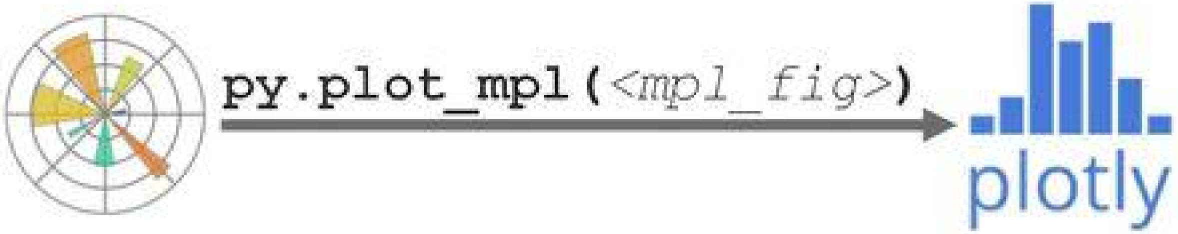
- No internet connection or keys required.
- Data remains private without paying.

Cons

- Must programmatically adjust all visual parameters to achieve desired looks
- Some of Plotly's functionality not available.

Other Features & Benefits of Plotly

- ➔ Matplotlib converter!
  https://plot.ly/matplotlib/



```
py.plot_mpl(<mpl_fig>)
```

- ➔ Live & static dashboards!!
  https://plot.ly/dashboards/

- ➔ Database connections!*
  http://help.plot.ly/database-connectors/

Connecting to a SQLite Database

Connecting to a Redshift Database

Connecting to a Postgres Database

Connecting to a MySQL Database

Connecting to a MS SQL Server Database

Connecting to a MARIADB Database

- ➔ Presentations?!*
  https://formidable.com/open-source/spectacle-editor/

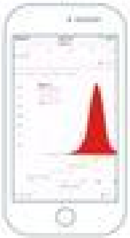
Formidable + Plotly

PRESENT

Spectacle Editor

The world's first open-source presentations editor.

- ➔ Mobile Ready!



* untested by me personally.

Getting more **help**...

Check out the docs for basics & examples...

https://plot.ly/python/

But for more info, use the docstrings...

Python: **help(***<call>***)**

iPython: ***call*?**

If you can't figure it out, post to the forums…

http://community.plot.ly/