CHICAGO
INTERNATIONAL
SOFTWARE DEVELOPMENT
CONFERENCE 2016

goto;
conference

Python Hype?

Brian Ray

Hi, I’m Brian Ray

- Directive Years
  1998-2003
- Engineering Years
  2003-2006
- Leadership Years
  2009-2010
- Indy Consulting Years
  2010-2013
- Big Four Consulting
  2013-current

Taken in China
May 20th, 2016

Why “Python Hype”?

In the last 10 years, we are seeing Python having (select one):

A. Slow and steady growth.

B. Spiked and now on decline.

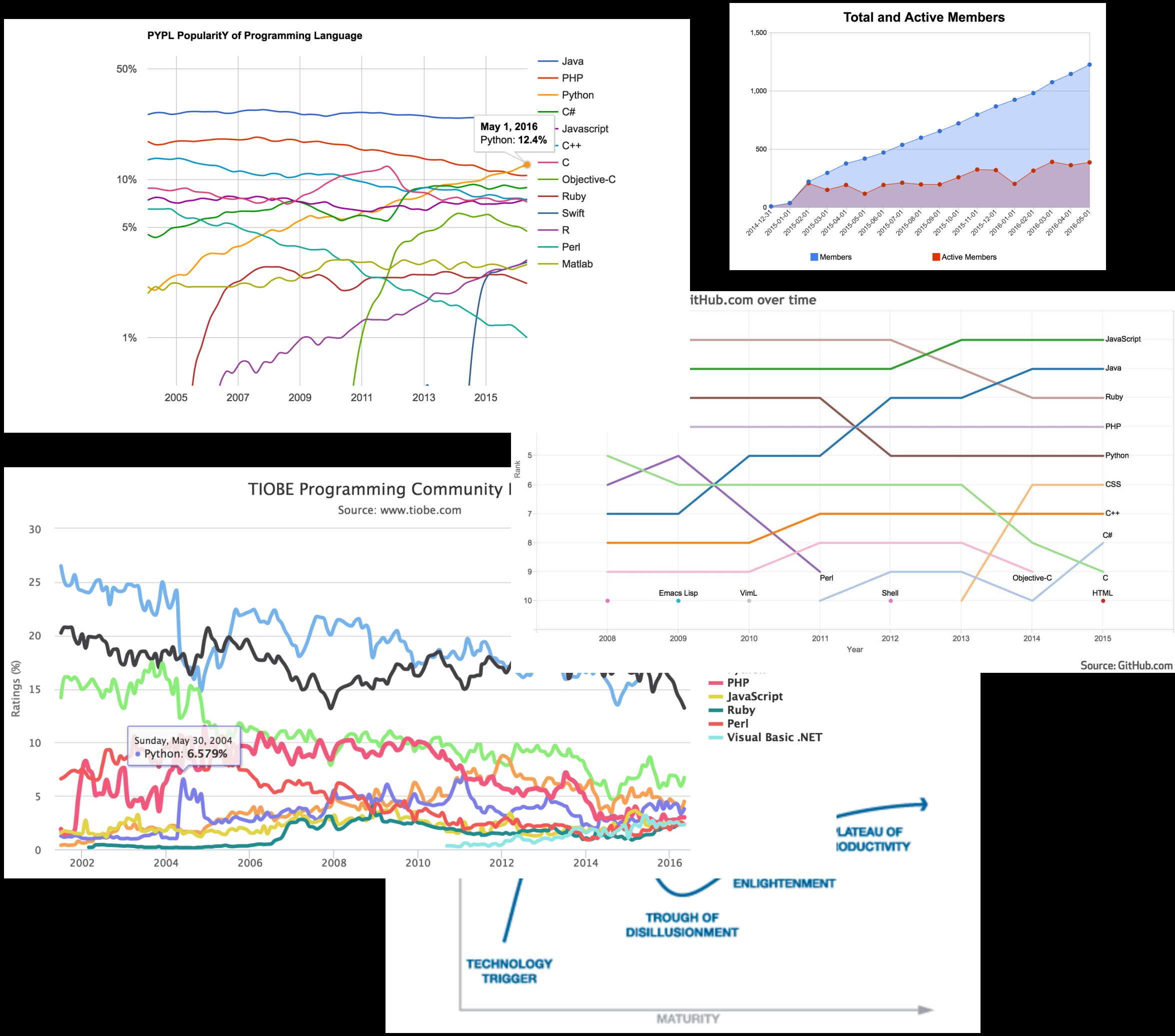
C. Spiked + Declined now stabilized.

D. Lives in independent domain.

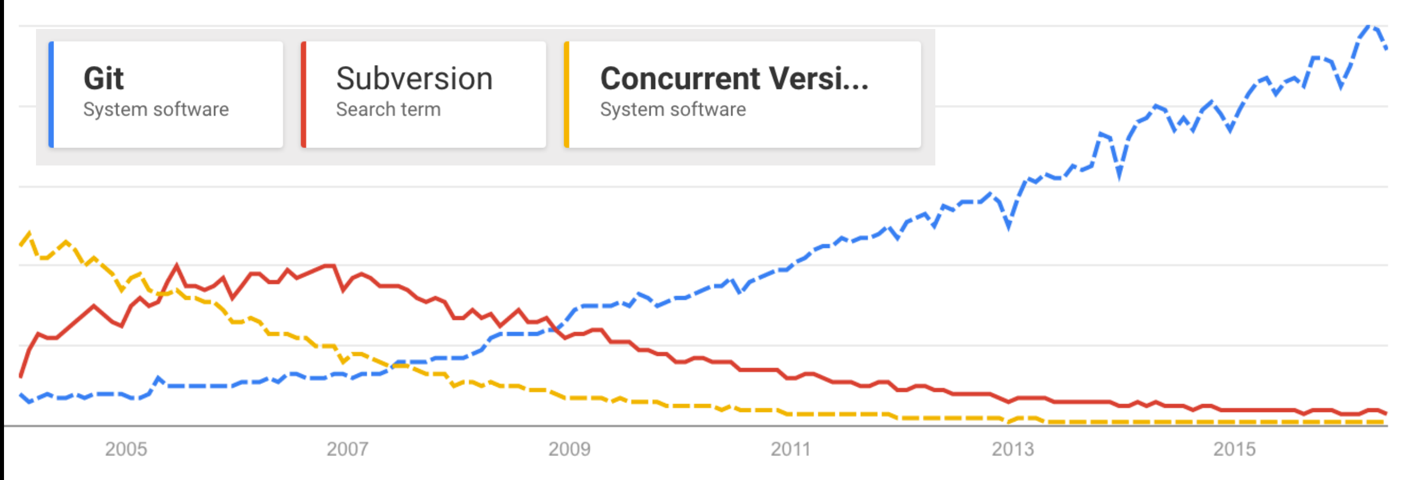
E. We (Python fans) live in a bubble.

What measure?

- Hype Cycle
- TIOBE Index
- On Github
- PYPL
- Some other



Don’t tell me there aren’t trends



Programming language “popularity” is hard to measure.

Lenses to help measure:

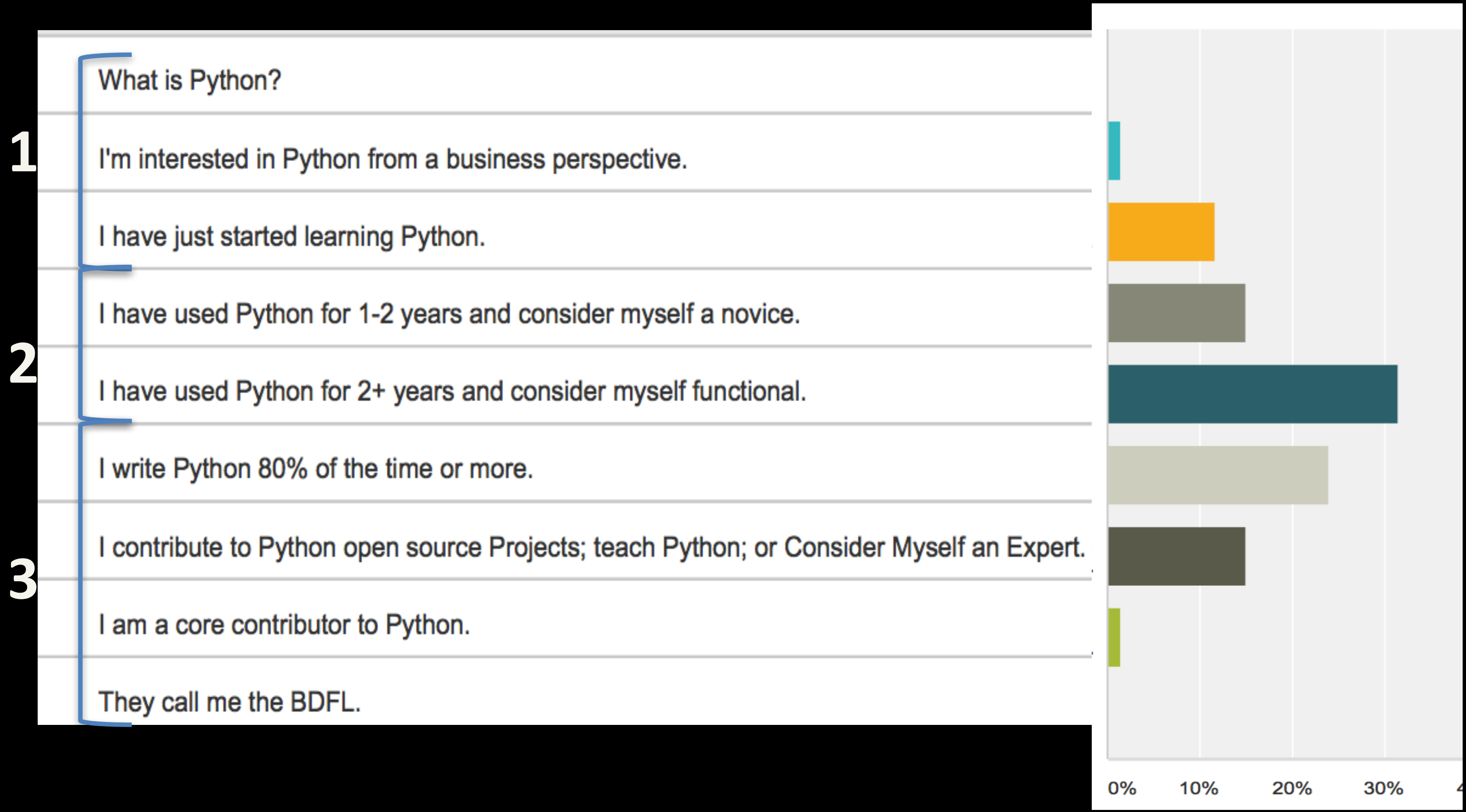
1. Learned: was taught Python in course
2. Migrated: from language to language
3. Addressed: problem class to solve
4. Platform-ed: ecosystem of tools
5. Retained: sticking with Python
6. Promoted: Promoted

236 respondents broken up into 3 groups

OUR SURVEY

Who

Groups



What is Python?

I'm interested in Python from a business perspective.

I have just started learning Python.

I have used Python for 1-2 years and consider myself a novice.

I have used Python for 2+ years and consider myself functional.

I write Python 80% of the time or more.

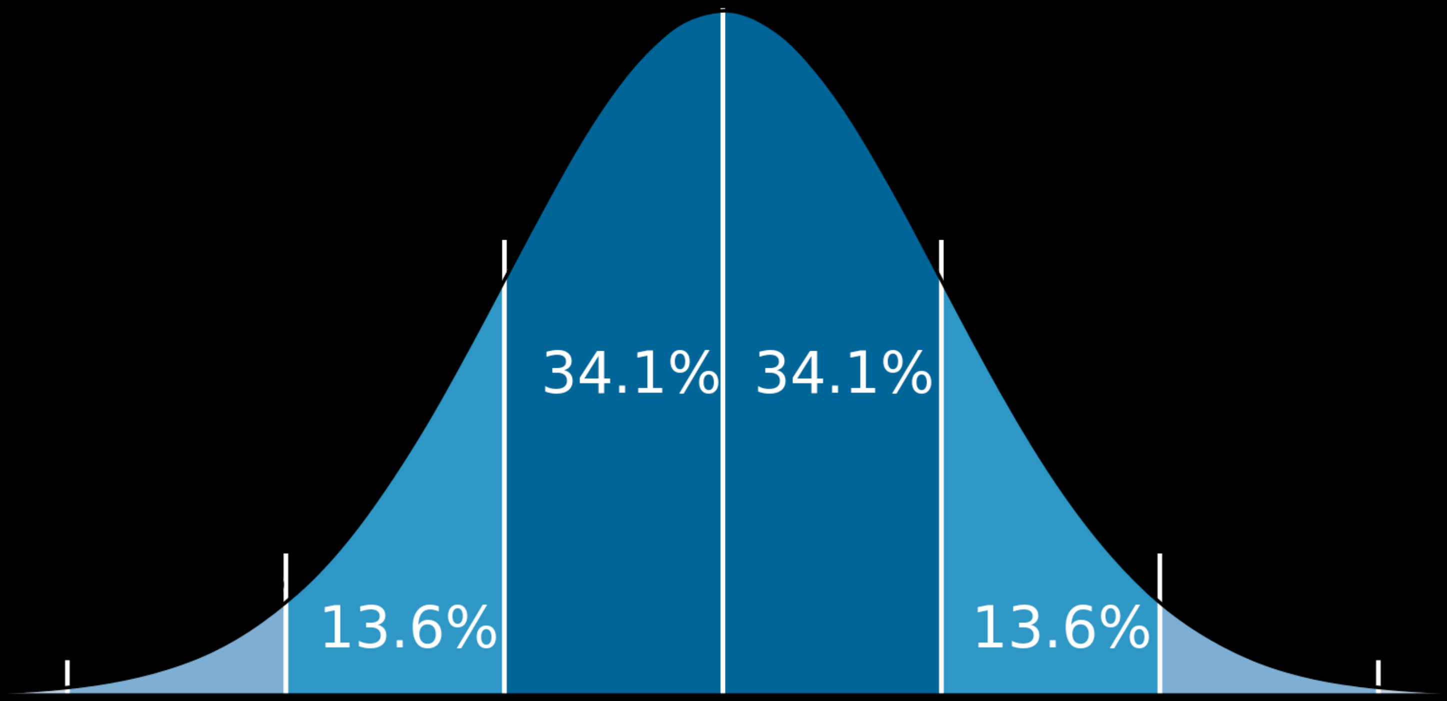
I contribute to Python open source Projects; teach Python; or Consider Myself an Expert.

I am a core contributor to Python.

They call me the BDFL.

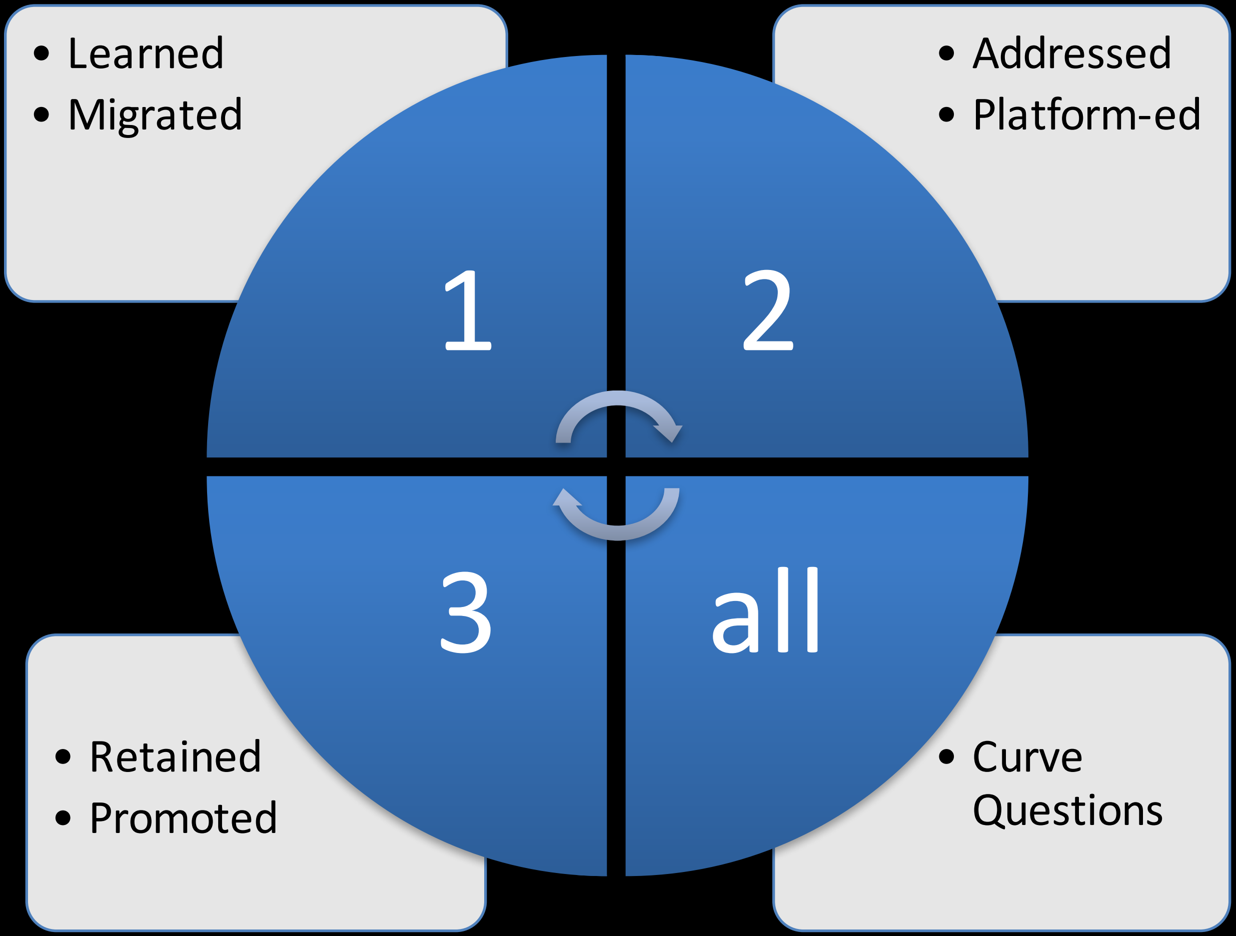
The missing group 4: Those who didn’t take the survey

User Distribution



1	**2**	**3**
29%	49 %	**22%**

Treatment of groups



- Learned
- Migrated

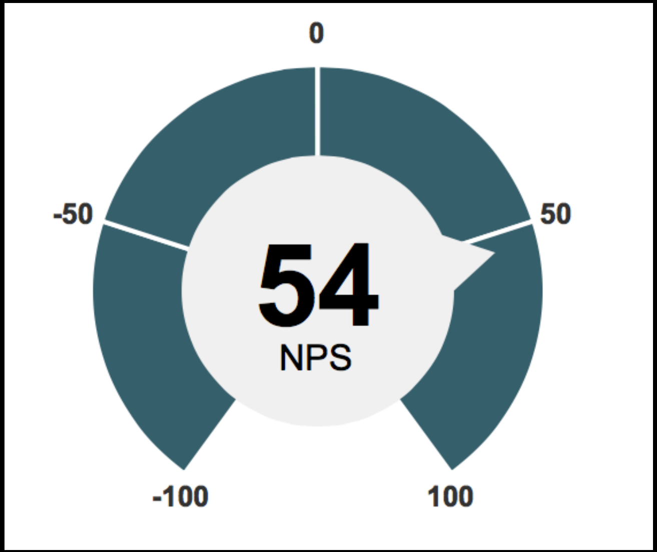
- Addressed
- Platform-ed

- Retained
- Promoted

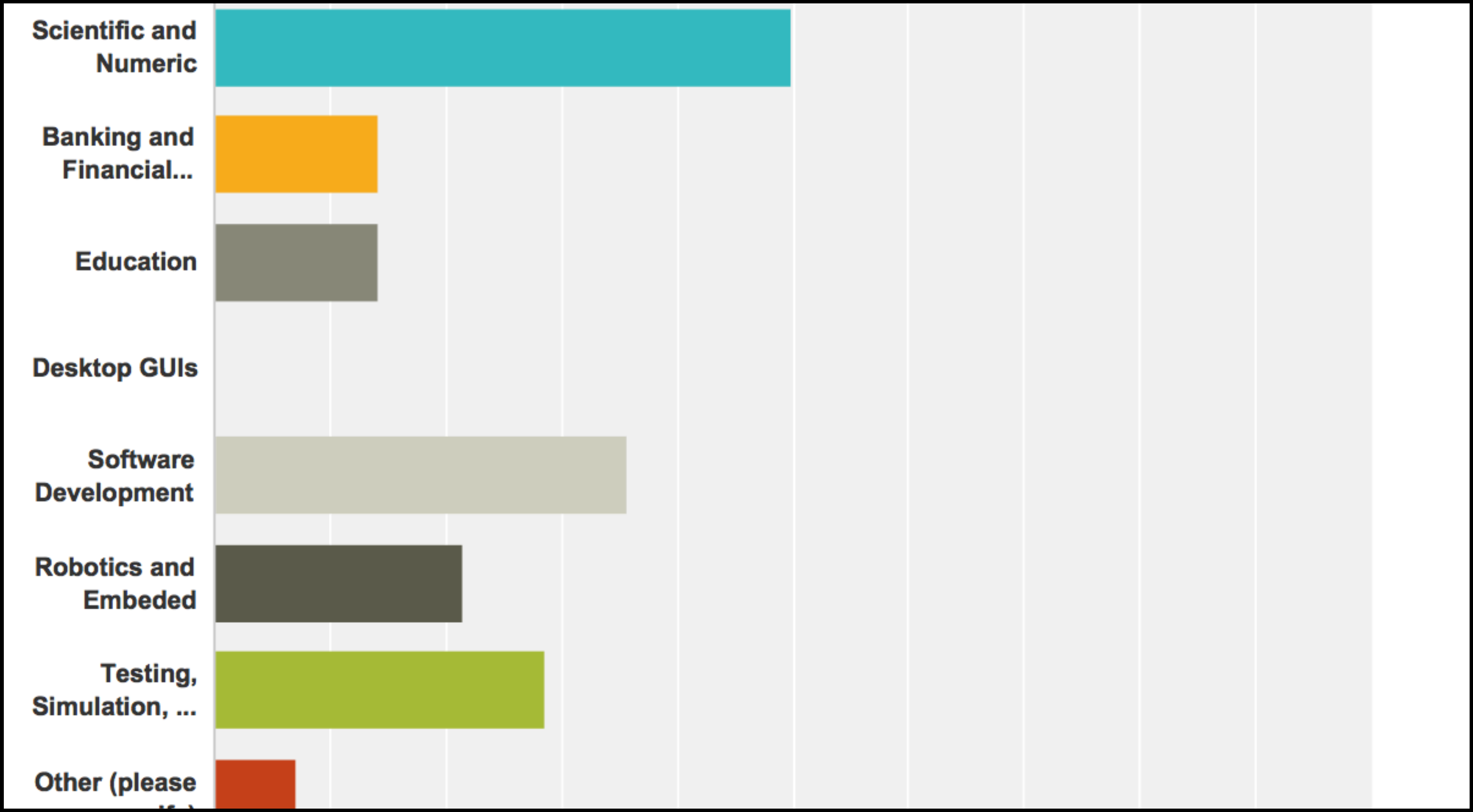
- Curve Questions

Group 1: Learned/Migrated

- 60% heard of python Word of mouth
- 56% had very positive first impression, 31% had positive, less than 13% neutral or less.
- Net-promoter to recommend

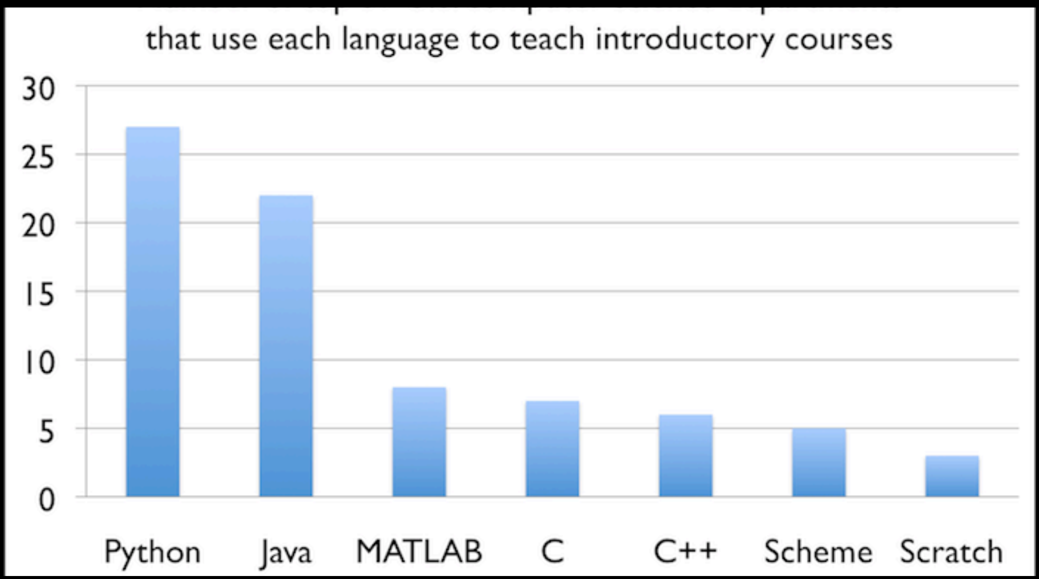


Group 1: Learned/Migrated



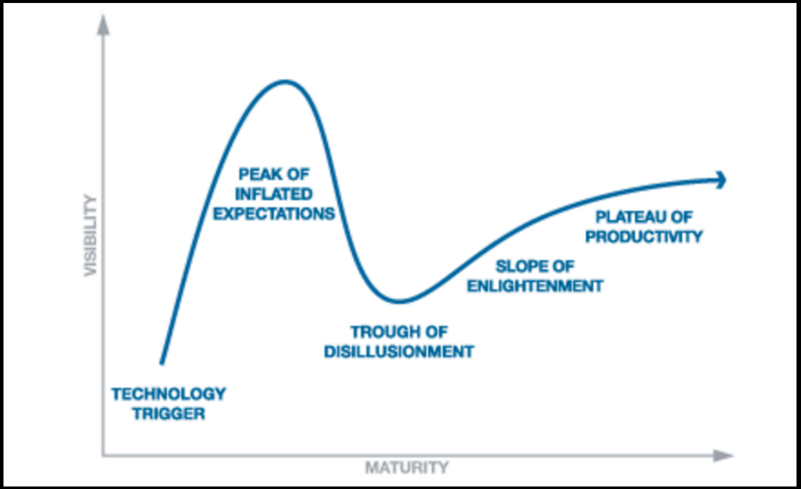
Group 1: Learned/Migrated

"Python is Now the Most Popular Introductory Teaching Language at Top U.S. Universities"
By Philip Guo
July 7, 2014



Group 2: addressed / platformed

- 63% very positive 1st impression (3% higher than Group 1)
- 77.5% very positive 2nd impression (after months)
- 71 % very positive 3rd impression



Hype curve-esk?

Group 2: addressed / platformed

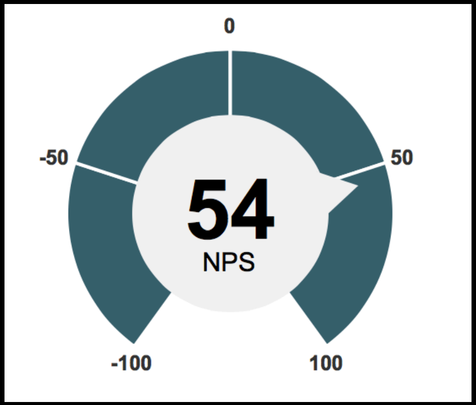
Likes:

- Flexibility, simplicity, transparency
- Legibility
- Easy to learn
- Approachable
- Community
- “Batteries included”
- Correct or “pythonic” way
- Standard library
- Online resources
- Scientific libraries
- Versatile
- Third party libraries
- Online communities
- Concise
- Easy to get started
- Not Java 8
- Garbage collection
- Great depth
- Complex times included

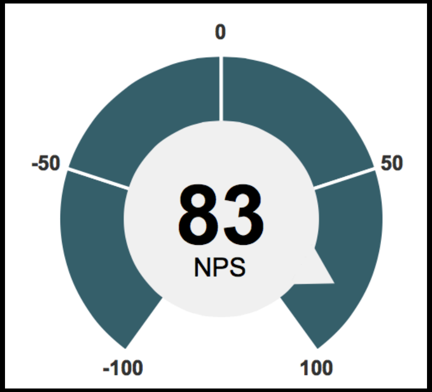
Dislikes:

- Poor documentation
- Don’t like whitespace
- Slow
- Prefer statically typed
- Threading
- Runtime not as ubiquitous as Java
- GIL
- Models not pip installable
- Inheritance can be confusing
- Lack of Mobile dev support
- That it’s not Lisp
- Python 2 or 3 choice
- Package support for Python 3
- Python 2 vs 3
- Dependency Management
- Installation Issues
- Smarmy attitude

Group 3: Retainer / Promoter



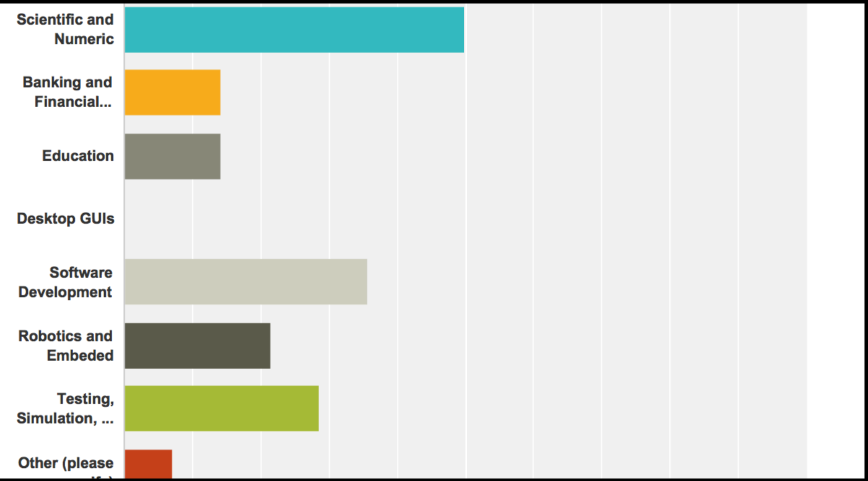
Group 1



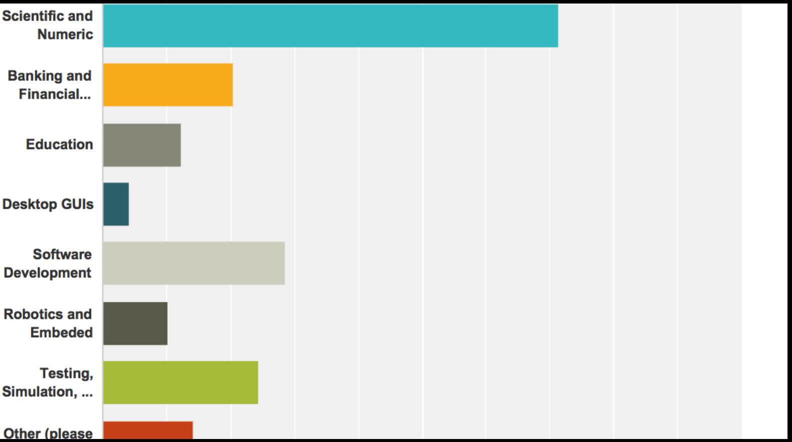
Group 3

- 53% think Python Very high quality, 39% High, less then 9% Natural or below

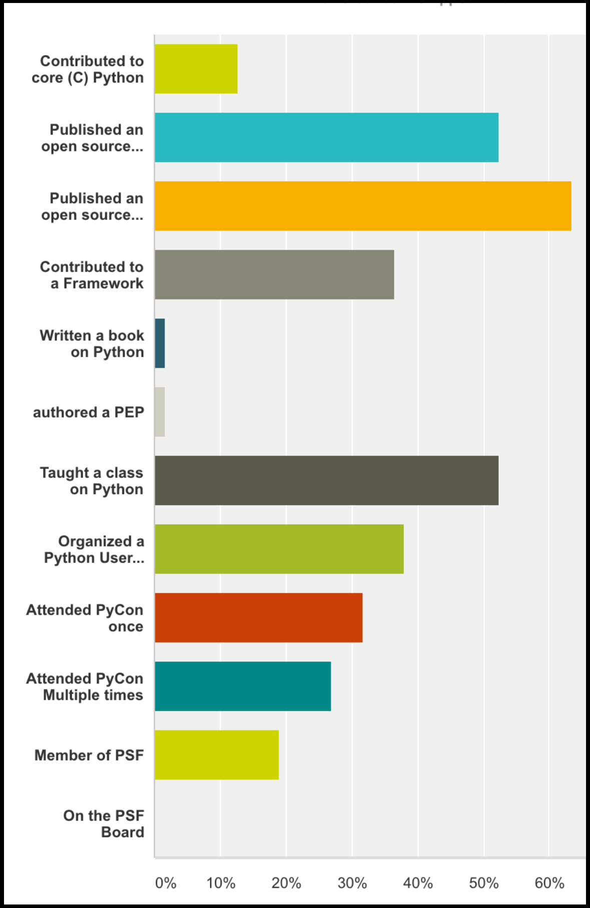
Group 3: Retainer / Promoter



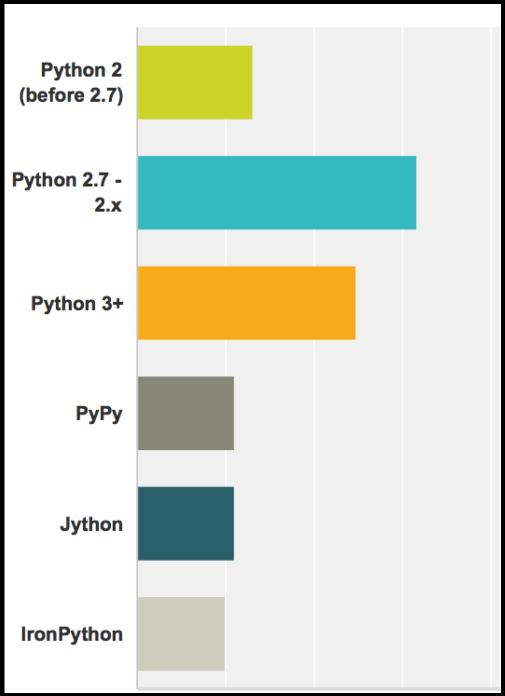
Group 1



Group 3



Group 3: Retainer / Promoter



Small drawbacks:
- 45% Speed
- 44% GIL
- 30% easy to duck type / monkey patch

Big Drawbacks:
- 9% GIL
- 15% Unicode Support

Critical:
- 5% Unicode Support

–	25%–	50%–	100%–
Python 2 (before 2.7)	10.64%	12.77%	2.13%
Python 2.7 - 2.x	16.67%	30.30%	43.94%
Python 3+	22.03%	32.20%	23.73%
PyPy	14.89%	0.00%	2.13%
Jython	4.44%	4.44%	0.00%

Group 3: third-party

- Surveyed 58 most downloaded pypi packages
- 53% marked “Used”
- 24% marked “long time user”
- 14% marked “plan on long time”
- 7% marked “stop”

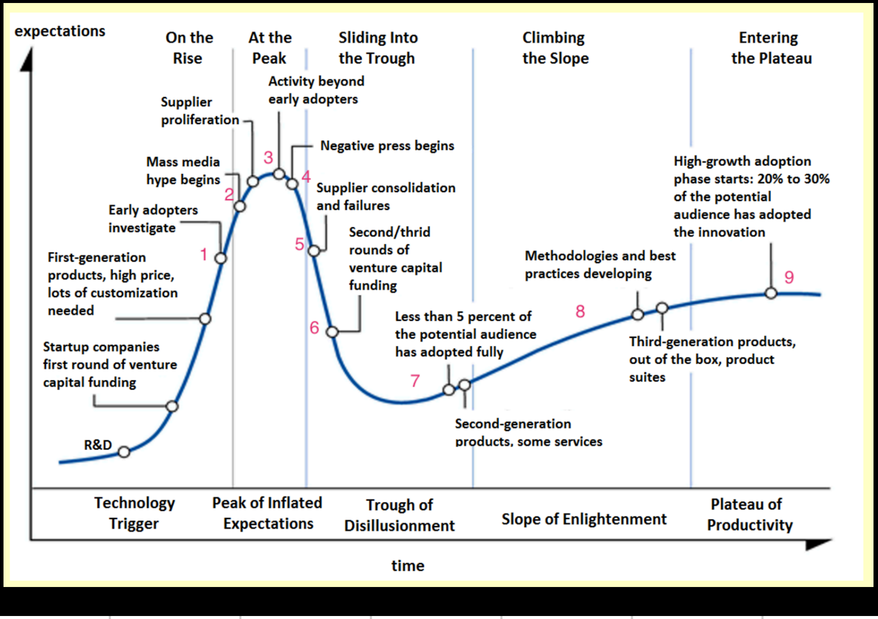
Group 3: third-party

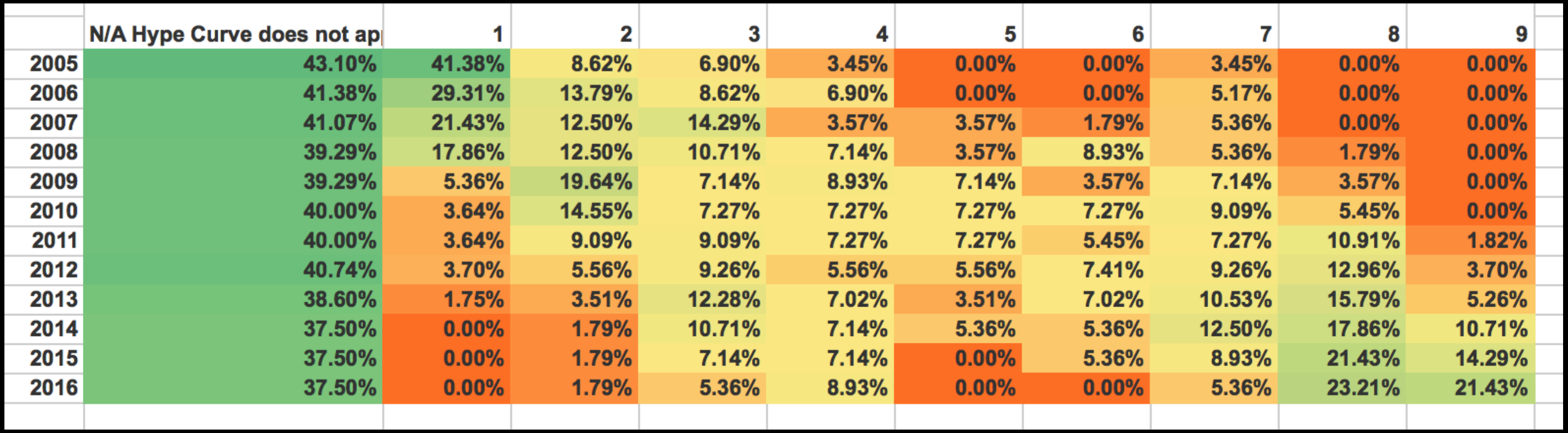
Top Plan on long time: **pip kid virtualenv ipython pep8 requests pandas django celery reportlab**

Top Stopped: **plone pylons pycurl twissted zope nose pyramid**

All Groups

- Hype

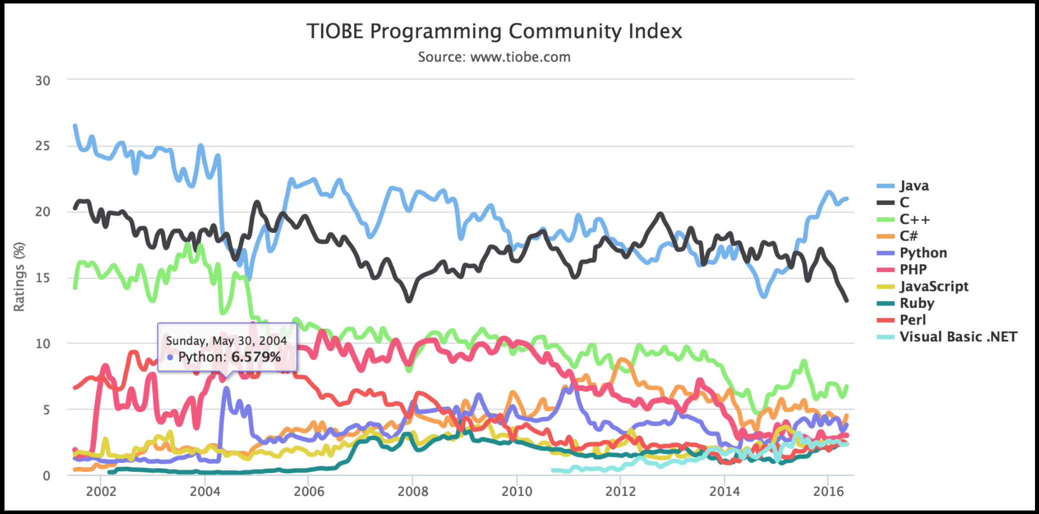

expectations
On the Rise
At the Peak
Sliding Into the Trough
Climbing the Slope
Entering the Plateau
Activity beyond early adopters
Supplier proliferation
Negative press begins
Mass media hype begins
Supplier consolidation and failures
High-growth adoption phase starts: 20% to 30% of the potential audience has adopted the innovation
Early adopters investigate
Second/thrid rounds of venture capital funding
Methodologies and best practices developing
First-generation products, high price, lots of customization needed
Less than 5 percent of the potential audience has adopted fully
Third-generation products, out of the box, product suites
Startup companies first round of venture capital funding
Second-generation products, some services
R&D
1
2
3
4
5
6
7
8
9
Technology Trigger
Peak of Inflated Expectations
Trough of Disillusionment
Slope of Enlightenment
Plateau of Productivity
time



	N/A Hype Curve does not ap	1	2	3	4	5	6	7	8	9
2005	43.10%	41.38%	8.62%	6.90%	3.45%	0.00%	0.00%	3.45%	0.00%	0.00%
2006	41.38%	29.31%	13.79%	8.62%	6.90%	0.00%	0.00%	5.17%	0.00%	0.00%
2007	41.07%	21.43%	12.50%	14.29%	3.57%	3.57%	1.79%	5.36%	0.00%	0.00%
2008	39.29%	17.86%	12.50%	10.71%	7.14%	3.57%	8.93%	5.36%	1.79%	0.00%
2009	39.29%	5.36%	19.64%	7.14%	8.93%	7.14%	3.57%	7.14%	3.57%	0.00%
2010	40.00%	3.64%	14.55%	7.27%	7.27%	7.27%	7.27%	9.09%	5.45%	0.00%
2011	40.00%	3.64%	9.09%	9.09%	7.27%	7.27%	5.45%	7.27%	10.91%	1.82%
2012	40.74%	3.70%	5.56%	9.26%	5.56%	5.56%	7.41%	9.26%	12.96%	3.70%
2013	38.60%	1.75%	3.51%	12.28%	7.02%	3.51%	7.02%	10.53%	15.79%	5.26%
2014	37.50%	0.00%	1.79%	10.71%	7.14%	5.36%	5.36%	12.50%	17.86%	10.71%
2015	37.50%	0.00%	1.79%	7.14%	7.14%	0.00%	5.36%	8.93%	21.43%	14.29%
2016	37.50%	0.00%	1.79%	5.36%	8.93%	0.00%	0.00%	5.36%	23.21%	21.43%

All Groups

- TIOBE



When did Python Peak:

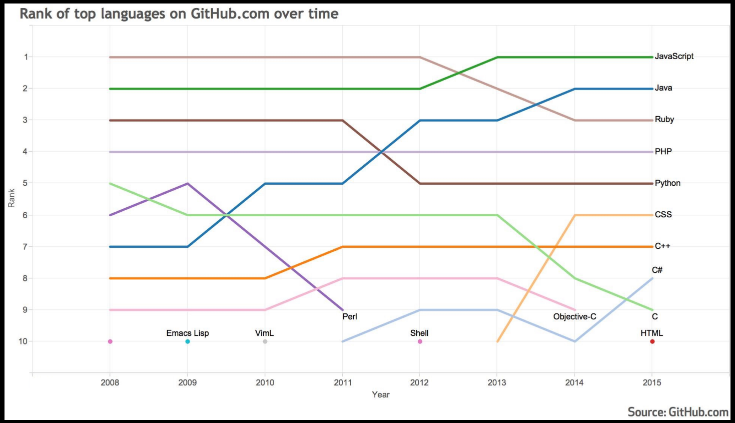
- 2007: 1%
- 2010: 28%
- Never: 46%
- Other: 23%

Other:

- 2011: when google recruited for
- Science/web lead to second wave
- 2011-2012
- 2014
- Peak is still coming
- Big Data will lead to future peak

All Groups

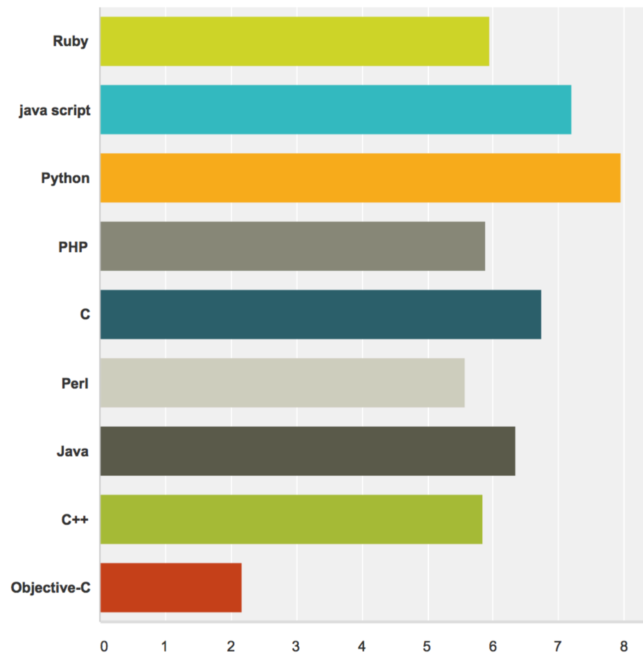
- Github



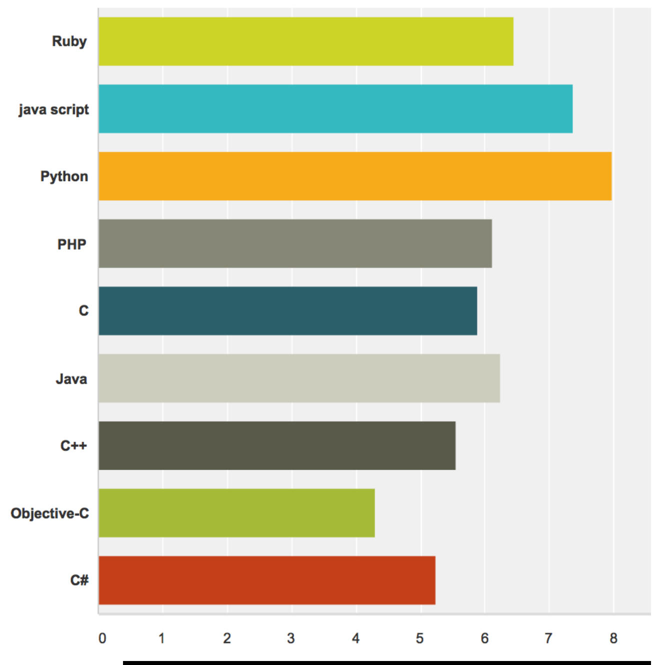
Rank of top languages on GitHub.com over time

Source: GitHub.com

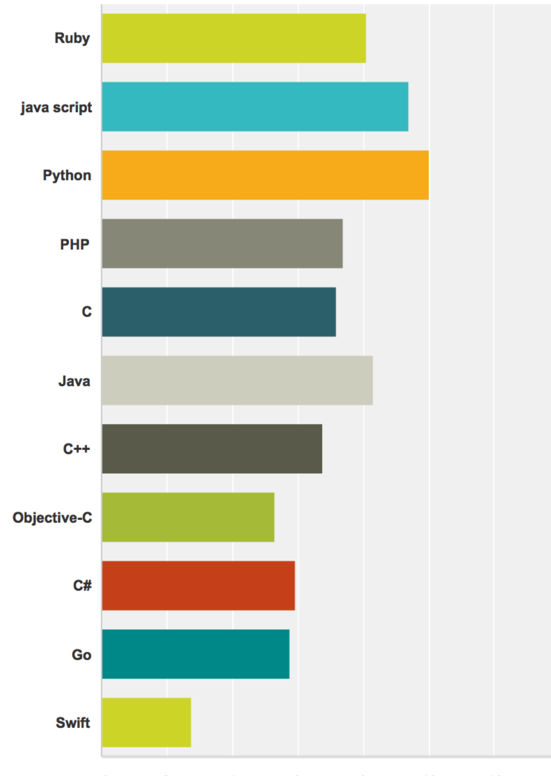
2008-2009



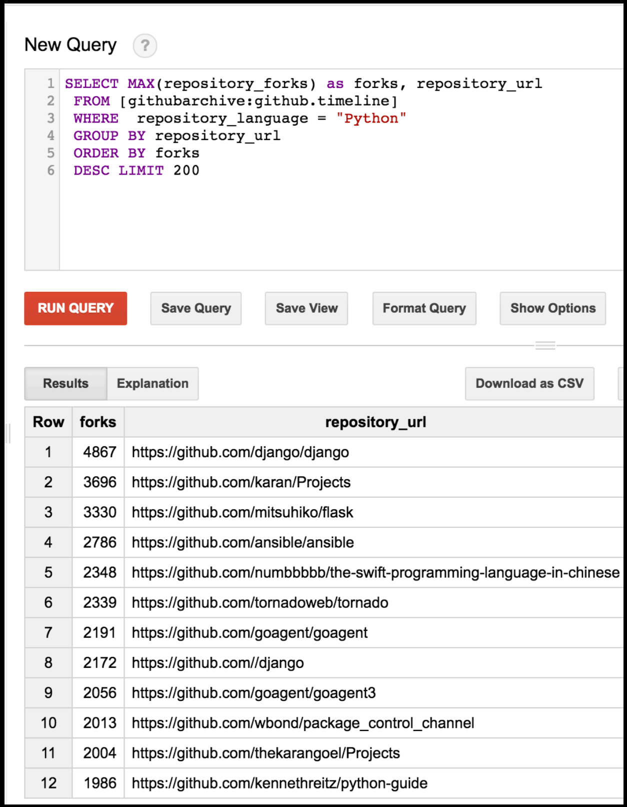
2010-2013



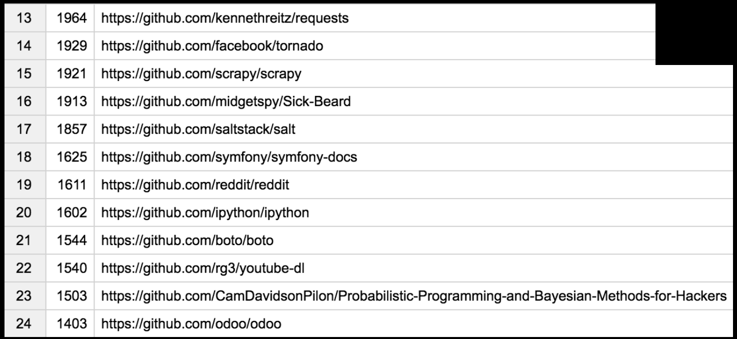
2014+



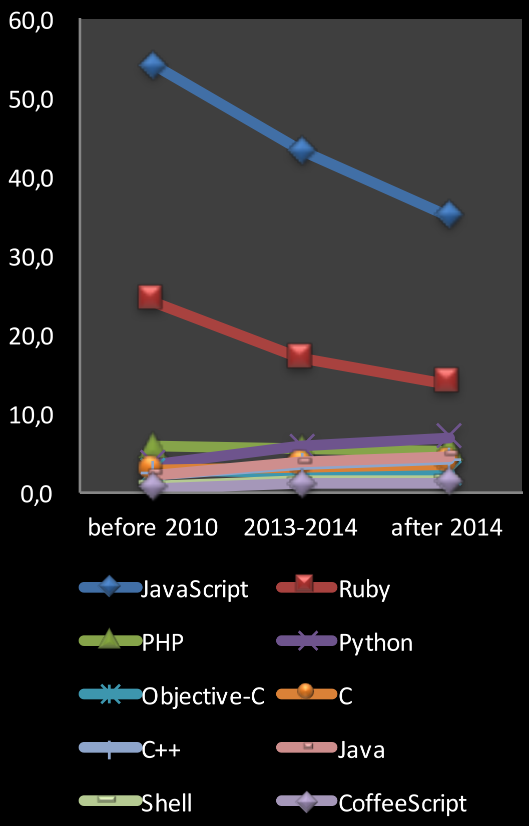
Github Top Python Projects

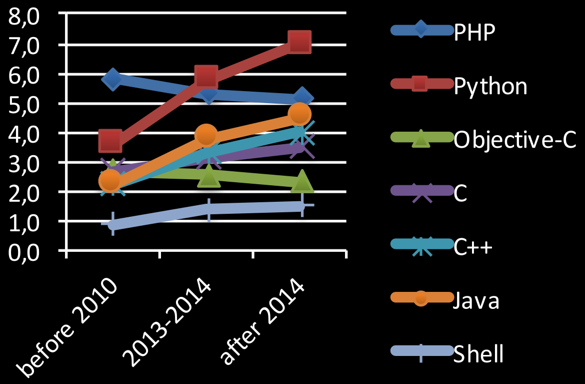


```
SELECT MAX(repository_forks) as forks, repository_url
 FROM [githubarchive:github.timeline]
 WHERE  repository_language = "Python"
 GROUP BY repository_url
 ORDER BY forks
 DESC LIMIT 200
```



Row	forks	repository_url
1	4867	https://github.com/django/django
2	3696	https://github.com/karan/Projects
3	3330	https://github.com/mitsuhiko/flask
4	2786	https://github.com/ansible/ansible
5	2348	https://github.com/numbbbbb/the-swift-programming-language-in-chinese
6	2339	https://github.com/tornadoweb/tornado
7	2191	https://github.com/goagent/goagent
8	2172	https://github.com//django
9	2056	https://github.com/goagent/goagent3
10	2013	https://github.com/wbond/package_control_channel
11	2004	https://github.com/thekarangoel/Projects
12	1986	https://github.com/kennethreitz/python-guide
13	1964	https://github.com/kennethreitz/requests
14	1929	https://github.com/facebook/tornado
15	1921	https://github.com/scrapy/scrapy
16	1913	https://github.com/midgetspy/Sick-Beard
17	1857	https://github.com/saltstack/salt
18	1625	https://github.com/symfony/symfony-docs
19	1611	https://github.com/reddit/reddit
20	1602	https://github.com/ipython/ipython
21	1544	https://github.com/boto/boto
22	1540	https://github.com/rg3/youtube-dl
23	1503	https://github.com/CamDavidsonPilon/Probabilistic-Programming-and-Bayesian-Methods-for-Hackers
24	1403	https://github.com/odoo/odoo





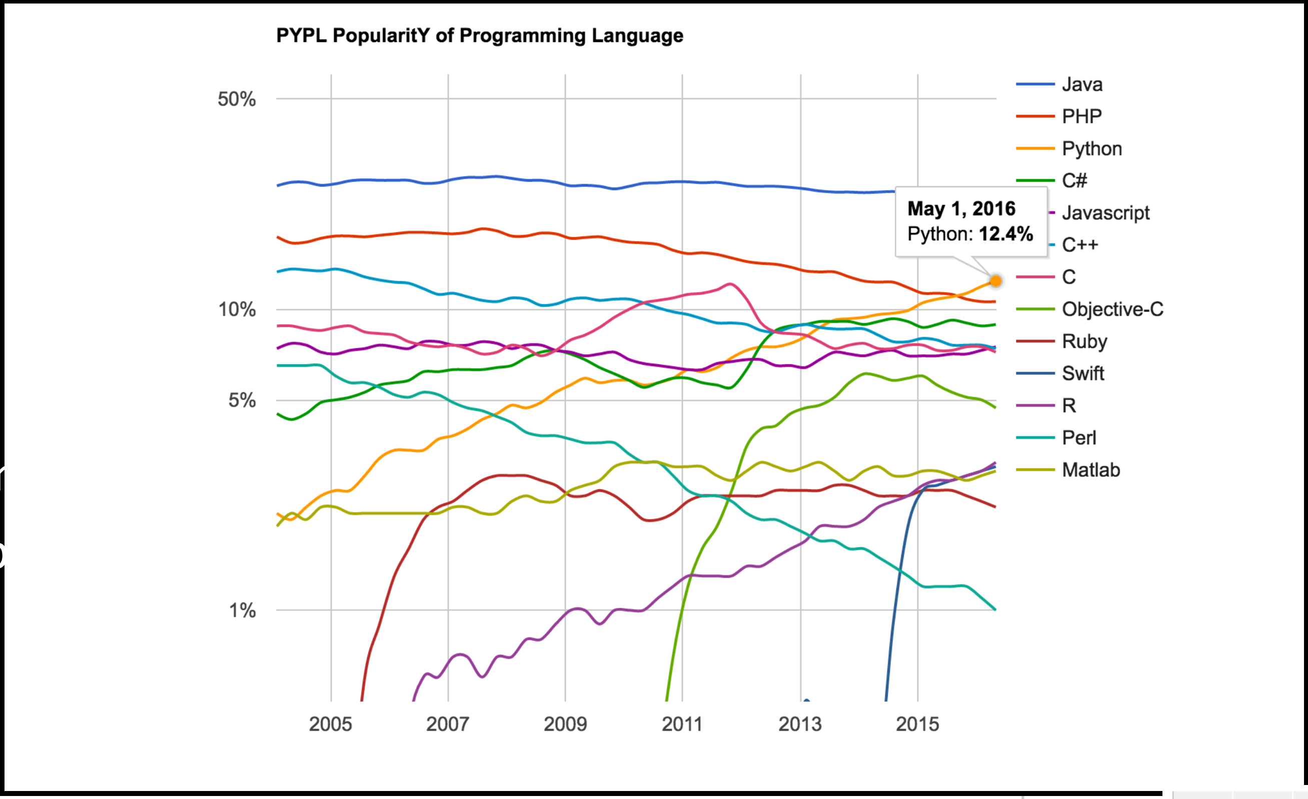
Activity, based on count: watched + forked

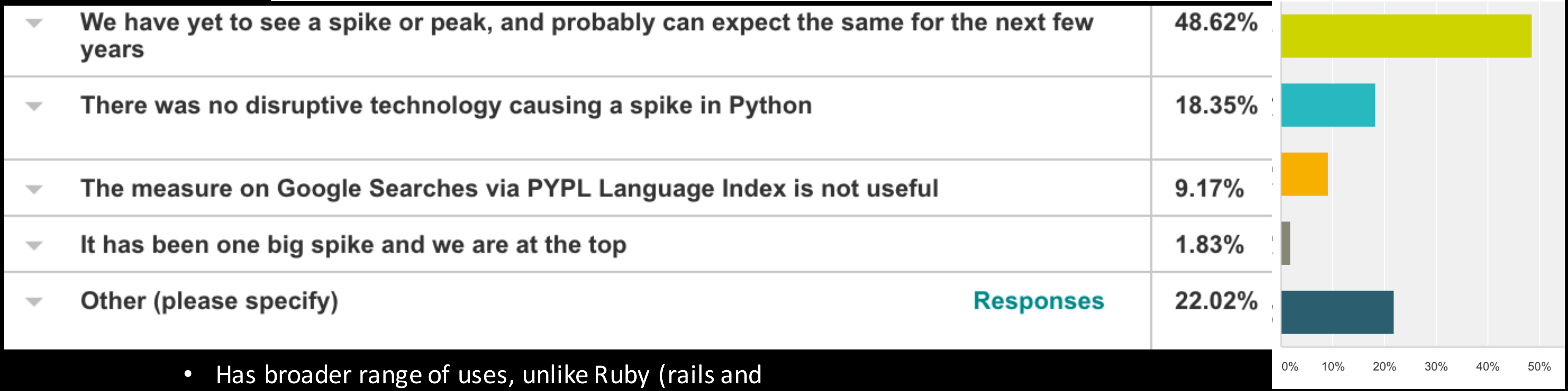
- PYP

Why seei

Steady up

Line?





We have yet to see a spike or peak, and probably can expect the same for the next few years		48.62%
There was no disruptive technology causing a spike in Python		18.35%
The measure on Google Searches via PYPL Language Index is not useful		9.17%
It has been one big spike and we are at the top		1.83%
Other (please specify)	Responses	22.02%

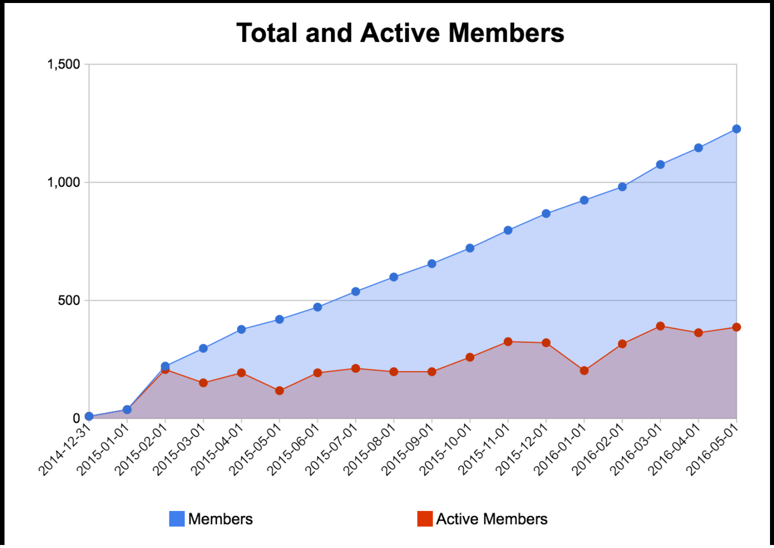
- Has broader range of uses, unlike Ruby (rails and devops)
- Mirrors Data Science Usage
- Mirrors Big Data Usage
- Steady growth

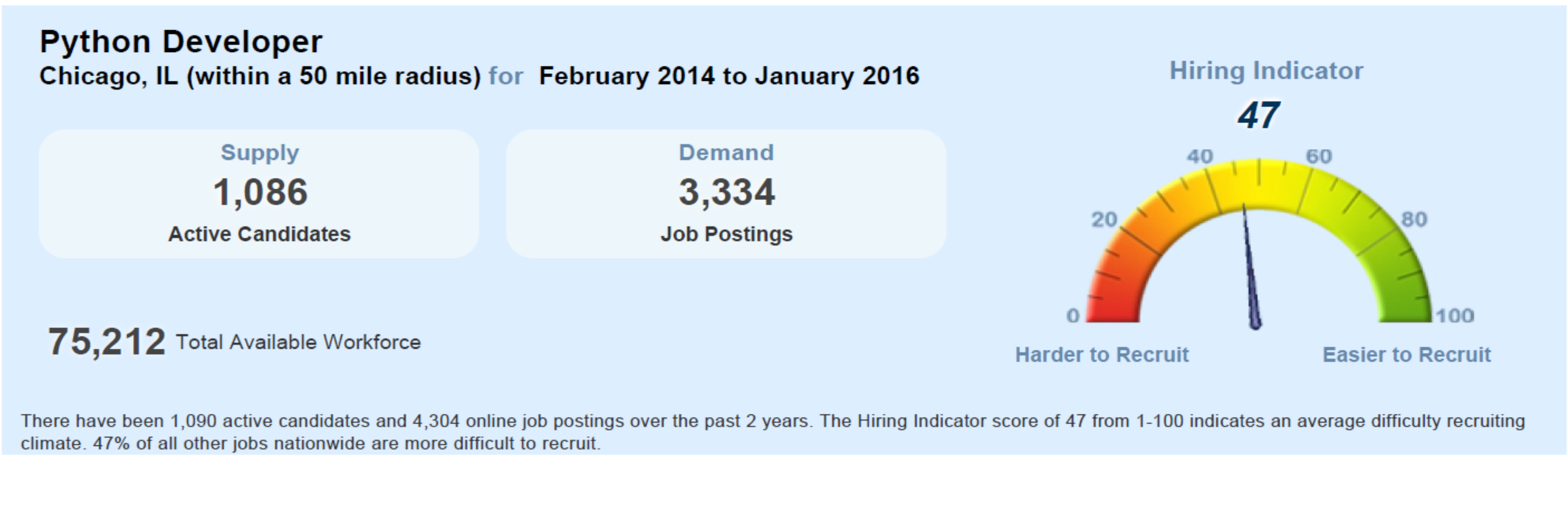
Some other “Popularity” Metrics

OTHER FACTORS

A local approach

- Jobs
- Meetups





Python Developer

Chicago, IL (within a 50 mile radius) for **February 2014 to January 2016**

Supply
1,086
Active Candidates

Demand
3,334
Job Postings

75,212 Total Available Workforce

Hiring Indicator
47

There have been 1,090 active candidates and 4,304 online job postings over the past 2 years. The Hiring Indicator score of 47 from 1-100 indicates an average difficulty recruiting climate. 47% of all other jobs nationwide are more difficult to recruit.

Corporate Suite

- Python (and R) compatibility with Commercial vendors: Datameer, IBM, Microsoft Azure, Oracle, Platfora, SAP, Tableau, Teradata and Tibco Software.

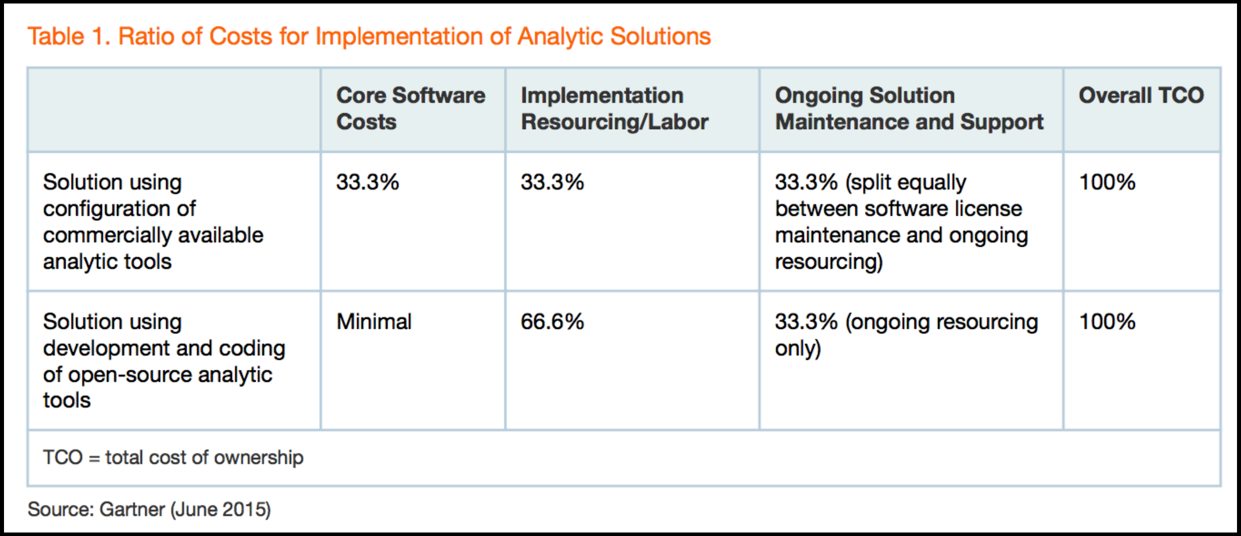


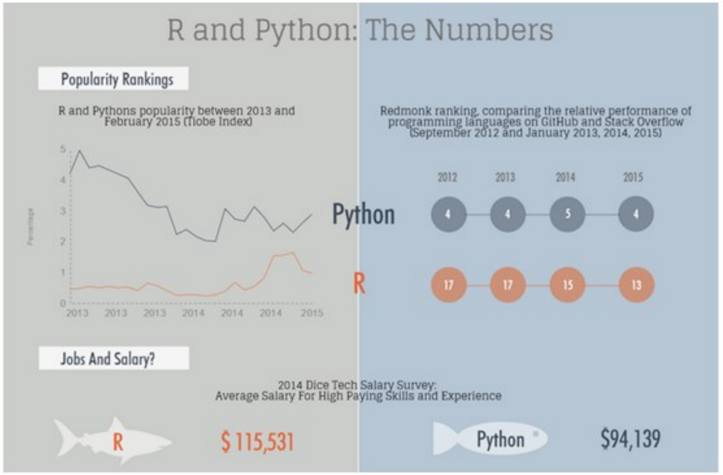
Table 1. Ratio of Costs for Implementation of Analytic Solutions

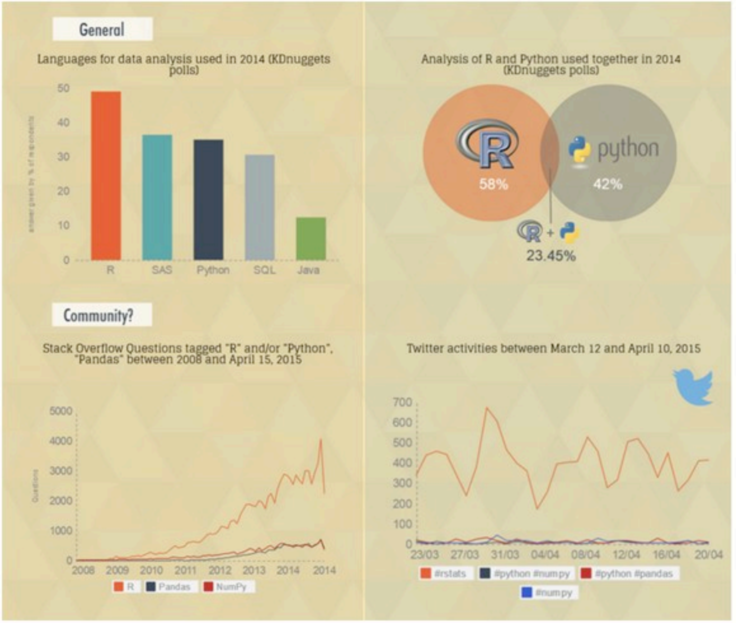
	Core Software Costs	Implementation Resourcing/Labor	Ongoing Solution Maintenance and Support	Overall TCO
Solution using configuration of commercially available analytic tools	33.3%	33.3%	33.3% (split equally between software license maintenance and ongoing resourcing)	100%
Solution using development and coding of open-source analytic tools	Minimal	66.6%	33.3% (ongoing resourcing only)	100%
TCO = total cost of ownership				

Source: Gartner (June 2015)

Adoption in Data Science

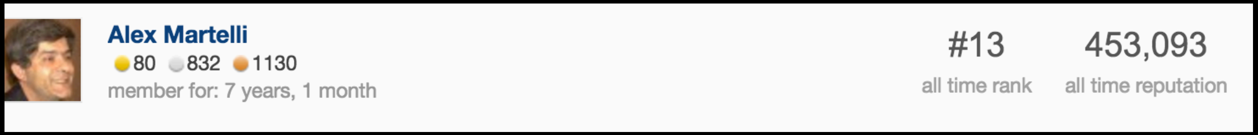
- KDNuggets reporting that 49% of analytics and data mining developers have used R, and 35% have used Python





Google hiring Python

It all got started, I believe, because the very earliest Googlers (Sergey, Larry, Craig, ...) made a good engineering decision: "Python where we can, C++ where we must” - Alex Martelli



Alex Martelli
● 80 ● 832 ● 1130
member for: 7 years, 1 month

#13
all time rank

453,093
all time reputation

Python's growth and acceptance in its many roles just hasn't followed any ups-and-downs curve as models would predict -- it's been pretty steadily, gradually upwards instead.

Some interpretation of results…

HIGHLIGHTS

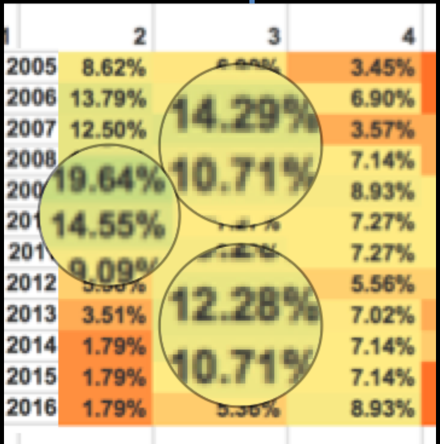
Revisiting our question

A. Slow and steady growth.
B. Spiked and now on decline.
C. Spiked + Declined now stabilized.
D. Lives in independent domain.
E. We (Python fans) live in a bubble.

Slow and steady growth.

Supports:

- Strong first impressions from Group 1, 2, 3
- Strong retention in group 2
- Spikes not measures as large
- 30% of hardcore users have switched to Python 3+ 50% of the time or more
- Because Alex Martelli says so



1	2	3	4
2005	8.62%	[illegible]	3.45%
2006	13.79%	[illegible]	6.90%
2007	12.50%	14.29%	3.57%
2008	[illegible]	10.71%	7.14%
2009	19.64%	[illegible]	8.93%
2010	14.55%	[illegible]	7.27%
2011	9.09%	[illegible]	7.27%
2012	[illegible]	[illegible]	5.56%
2013	3.51%	12.28%	7.02%
2014	1.79%	10.71%	7.14%
2015	1.79%	[illegible]	7.14%
2016	1.79%	5.36%	8.93%

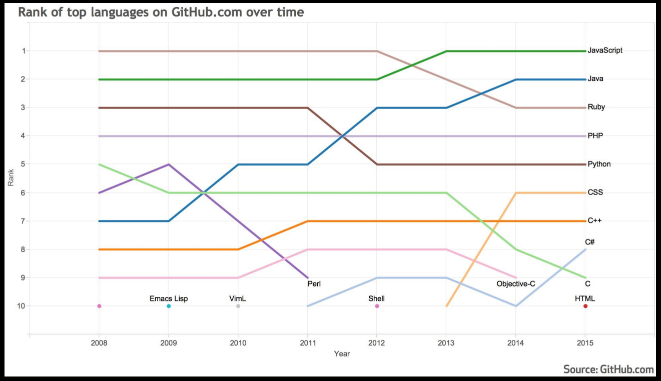
Negates:

- 20% no disruptive
- 5% increase in watchers+forkers on github
- We did measure some spikes

Spiked and now on decline.

Supports:

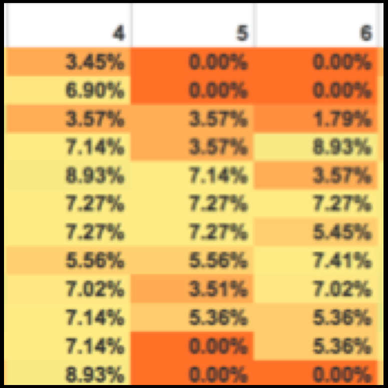
- Some domain-specific languages, push down?
- Lack of mobile support
- Small amount of degative: 2/3 support, swarmy


Rank of top languages on GitHub.com over time

Source: GitHub.com

Negates:

- Lack of significant data showing decline in Python popularity
- Very low activity scores confirming decline
- Not much negative press
- 46% say never peaked



4	5	6
3.45%	0.00%	0.00%
6.90%	0.00%	0.00%
3.57%	3.57%	1.79%
7.14%	3.57%	8.93%
8.93%	7.14%	3.57%
7.27%	7.27%	7.27%
7.27%	7.27%	5.45%
5.56%	5.56%	7.41%
7.02%	3.51%	7.02%
7.14%	5.36%	5.36%
7.14%	0.00%	5.36%
8.93%	0.00%	0.00%

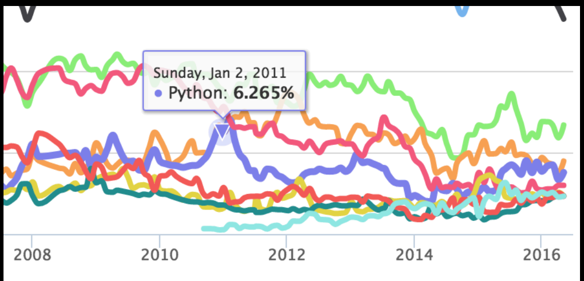
Spiked + Declined now stabilized

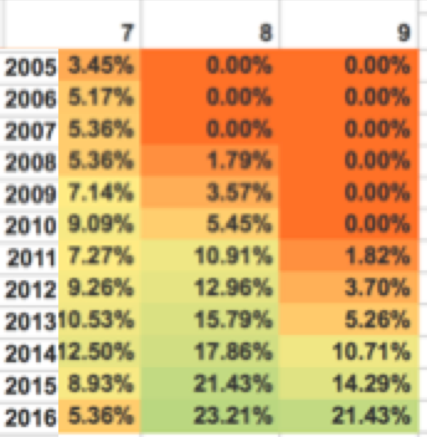
Supports:

- 30% Data Science market uses Python
- ¼ surveyed see as in reached Productivity/maturity
- TOIBE shows some spike-ish around 2010- 28% surveyed agree

Negates:

- Hard to measure market penetration, is it 20%
- Of third party packages, only 14% plan on using what they use now for a long time



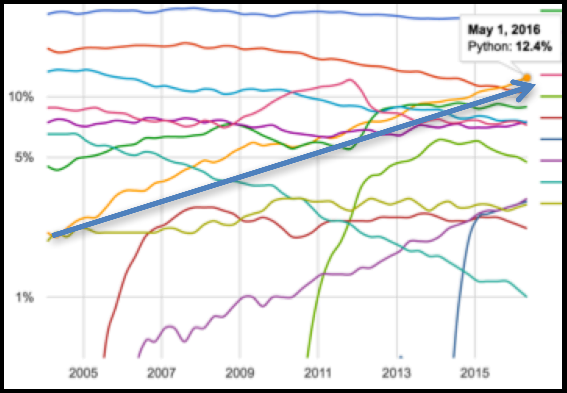


	7	8	9
2005	3.45%	0.00%	0.00%
2006	5.17%	0.00%	0.00%
2007	5.36%	0.00%	0.00%
2008	5.36%	1.79%	0.00%
2009	7.14%	3.57%	0.00%
2010	9.09%	5.45%	0.00%
2011	7.27%	10.91%	1.82%
2012	9.26%	12.96%	3.70%
2013	10.53%	15.79%	5.26%
2014	12.50%	17.86%	10.71%
2015	8.93%	21.43%	14.29%
2016	5.36%	23.21%	21.43%

Lives in independent domain

Supports:

- Python remained someone on effected on the PYPL Index where clearly other languages ebbed and flowed



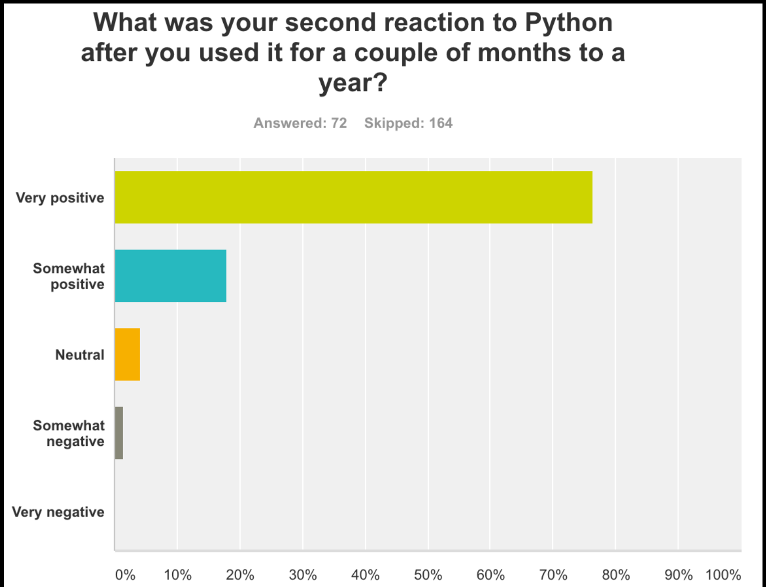
Negates:

- Google and others site using Python with other languages
- Considered good-glue
- Commercial software vendors adding Python support

We (Python fans) live in a bubble

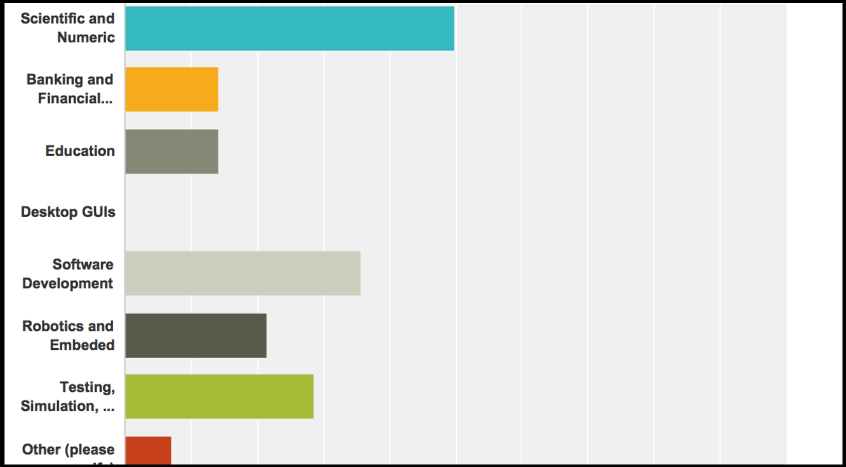
Supports:

- Nearly 90% approval rating is insane, and that's who took the survey
- 45% of users found Python from Word of Mouth



Negates:

- Python lives in two many different independent domains to be blind sided



In my own words

SOME CLOSING THOUGHTS

The Future of Python

- A good choice to learn
- Not going away (anytime soon)
- Get involved with your local community
- Contribute in your area of interest
- Python Addition Helpline
- Openness allows self fulfilling prophecy
- Still, don’t live in a vacuum, learn other languages!

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THANK YOU!

Please

Remember to rate this session

Thank you!