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Senior Data Scientist

Day 2

04-08-2018

Analytics, Python

Flash Back

Types Of Analytics

Descriptive

Predictive

Prescriptive

What has happened?

**What could happen in
the future ?**

**What should a
business do ?**



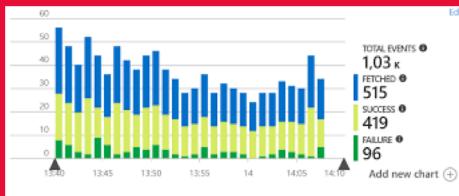
Data Scientist



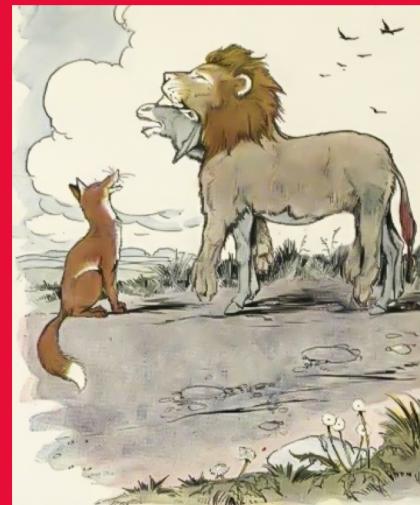
Descriptive



Creatures	Count	Place	Time	Event
Deer	2	North	Morning	Prey
Zebra	1	South	Evening	Prey
Deer	1	North	Noon	Escaped



Day - 1



Descriptive Example

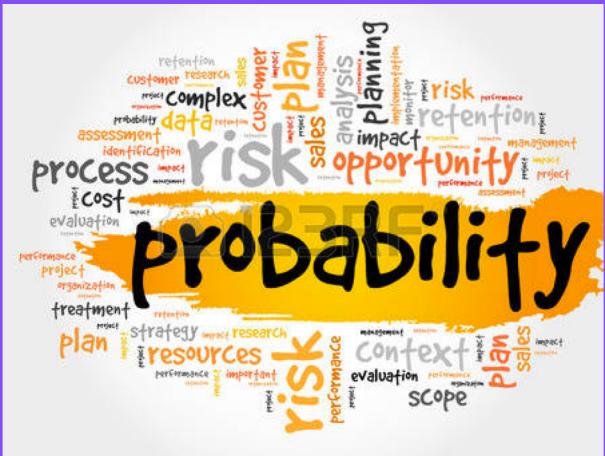
- Summarizing past events such as **regional sales, customer attrition, or success of marketing campaigns.**
- Tabulation of social metrics such as **Facebook likes, Tweets, or followers.**
- Reporting of general trends on **product specification.**



ML Technique



Predictive



Predictive Analytics Example

- Identify customers that are likely to abandon a service or product.
- Send marketing campaigns to customers who are most likely to buy.
- Improve customer service by planning appropriately.

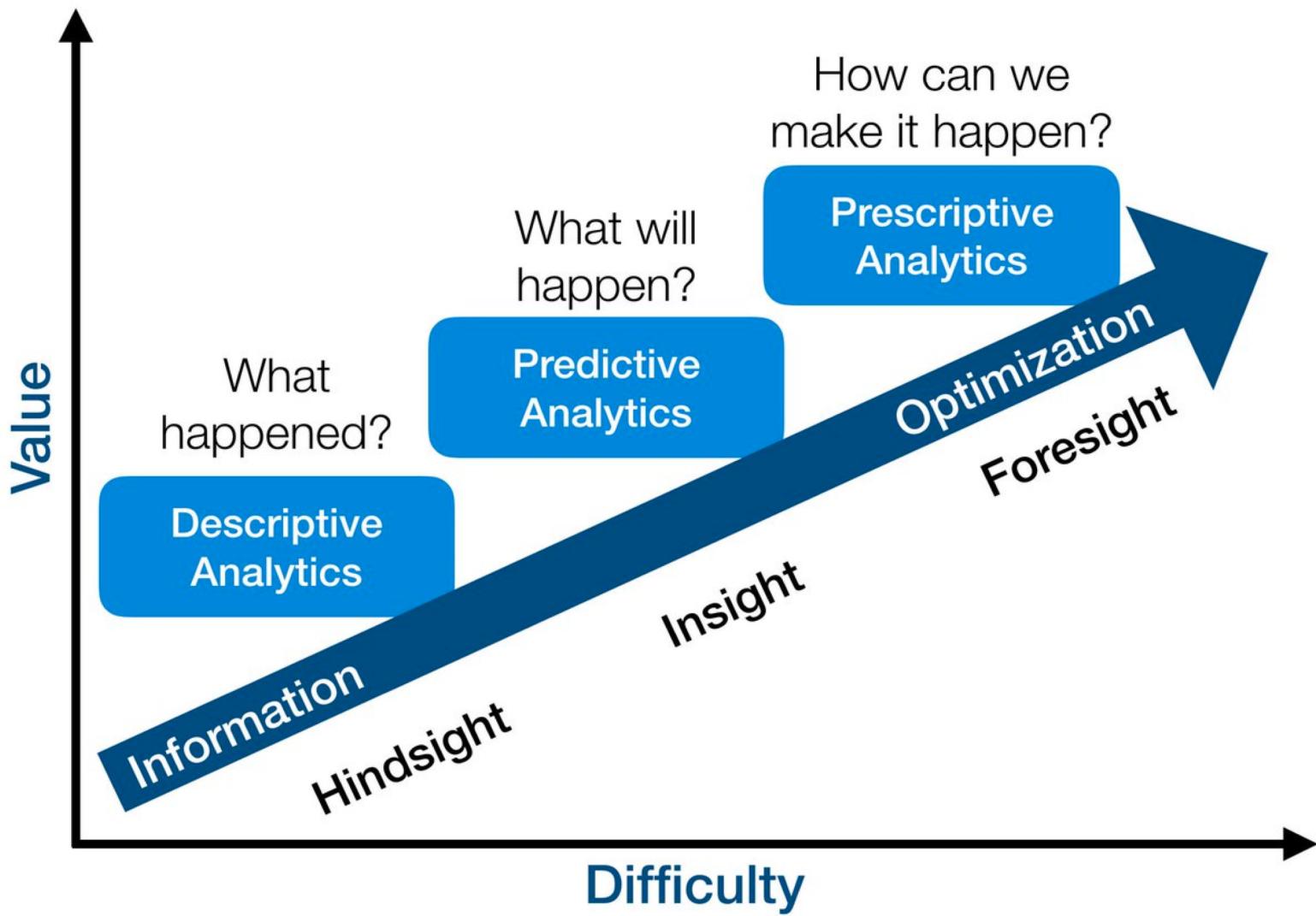


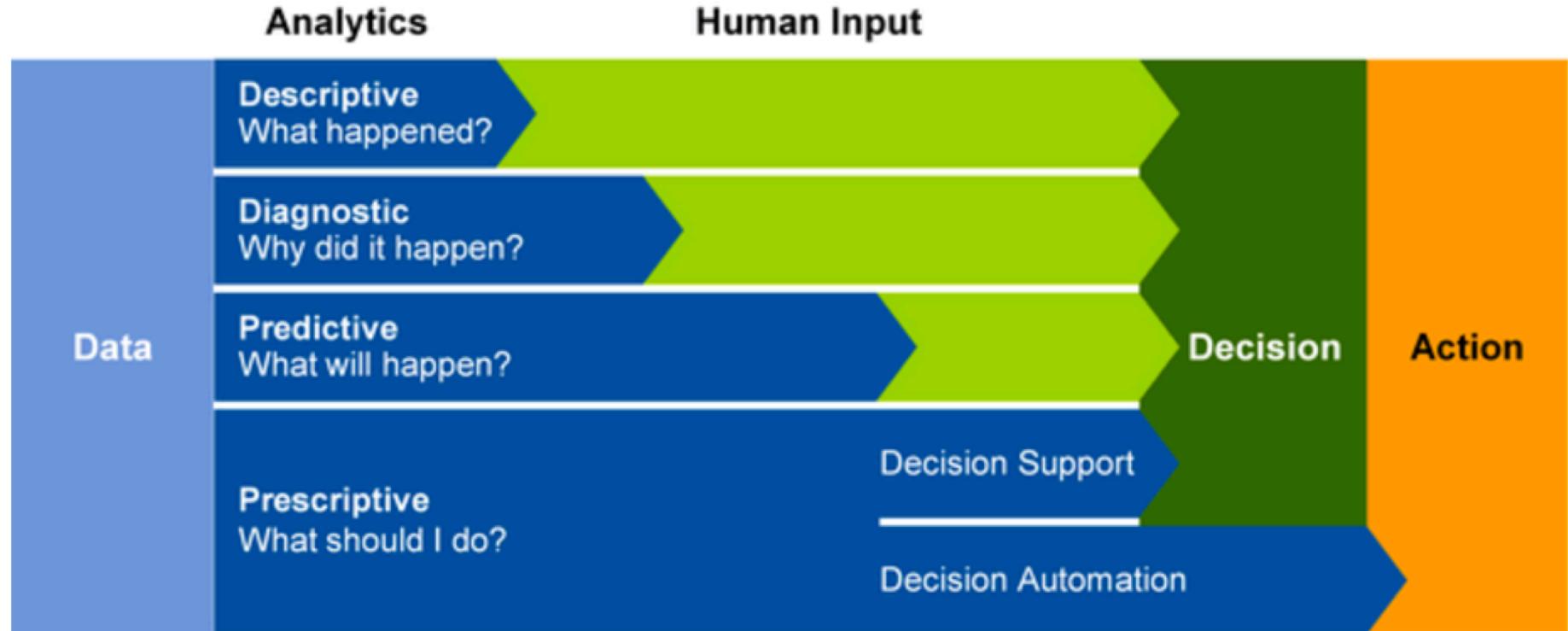
Automation(Prescriptive)



Prescriptive Analytics Example

- Google's self driving car
- Robots
- Flying drones





Types of Machine Learning

Supervised

Unsupervised

Reinforcement

Labelled Data
Predict the future outcome

No Labels
Find hidden structure

Learn from series of action
Decision process



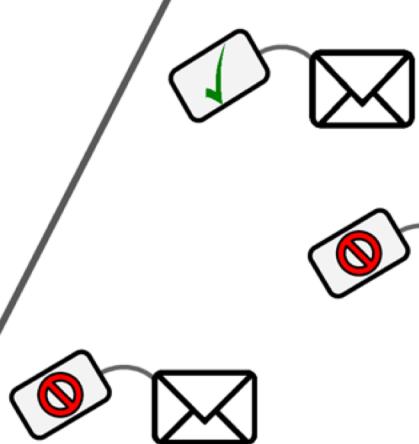
Supervised



?

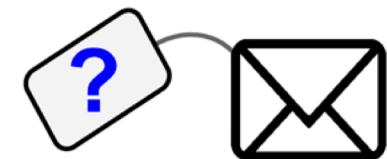
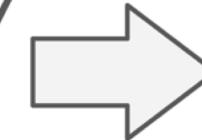
Spam or Ham?

Training set



Label

Instance



New instance

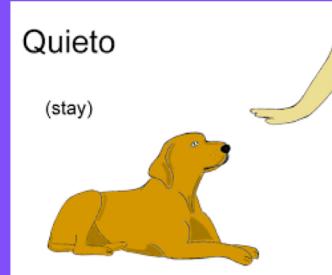


Unsupervised



Unsupervised Example

- Google photos segment
- Customer segmentation in marketing

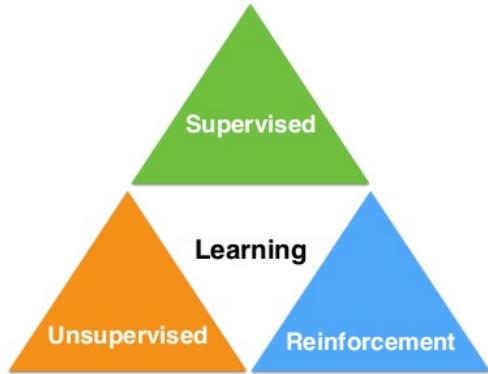


Reinforcement



Reinforcement Learning Example





- Labeled data
- Direct feedback
- Predict outcome/future

Regression Systems

- Ticket volume forecasting
- Sales forecasting

Classification Systems

- Email spam detection
- Intent detection
- Churn prediction
- Ticket Field prediction
- Lead scoring

Clustering Systems

- Customer segmentation
- Grouping Similar issues

Recommender Systems

- Kbase Suggestion
- Friend Suggestion in Fb, Linkedin
- People who bought this also bought...

Reinforcement Systems

- Game playing
- Drone flying

Real AI experts & practitioners to follow, to cut out noise



D J Patil
US Chief Data Scientist



Andrew N G
Chief Scientist at Baidu & Co-founder of Coursera



Daphne Koller
Expert at Probabilistic Graphical Models & Co-founder of Coursera



Yann LeCun
Director of Facebook AI Research



Jeff Dean
Co-creator of Tensorflow, MapReduce & Senior fellow in Google Brain



Fei-Fei Li
Director - Stanford AI Lab
Chief Scientist AI/ML - Google Cloud



Yoshua Bengio
Pioneer in ANN & Deep Learning



Peter Norvig
Director of Research at Google



Geoff Hinton
Godfather of Neural Networks



Sebastian Thrun
Brain behind Google's self driving cars & Co-founder of Udacity



Python

General purpose high level programming language

Who gifted Python?

Guido Van Rossum

1989

National Research institute in Netherland

Official Birthday - Feb 20 1991



```
1 class
2 {
3     public static void main(String[] args)
4     {
5         System.out.println("Hello World!");
6     }
7 }
8
```

```
>>> a,b=10,20
>>> print(a+b)
30
>>> a,b,c,d,e=10,20,30,40,50
1
```

Python 3.6.3 Shell

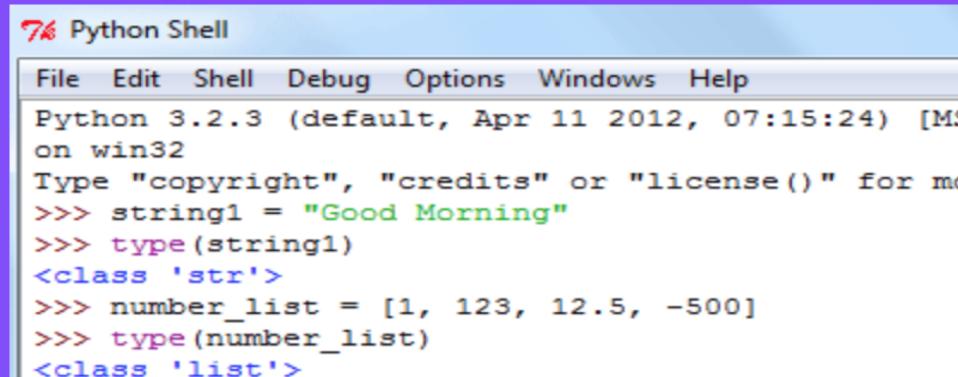
File Edit Shell Debug Options Window Help

```
Python 3.6.3 (v3.6.3:2c5fed8,
on win32
Type "copyright", "credits" or
>>> print("Hello world")
Hello world
>>>
```

Statically typed programming - C, Java

```
//Program entry
public static void Main(string[] args0)
{
    int a, b, result; //Integer variables
```

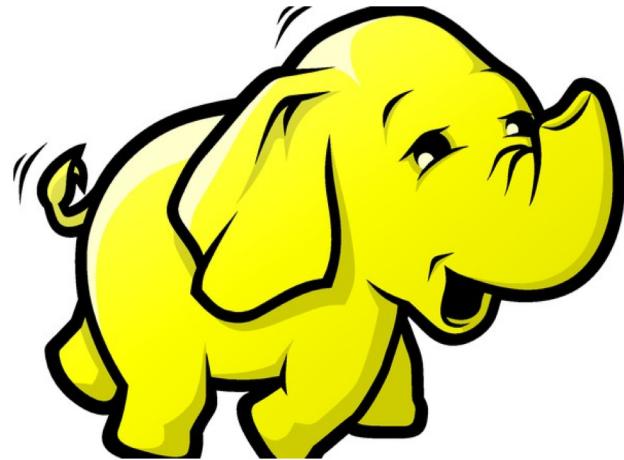
Dynamically typed programming - Python



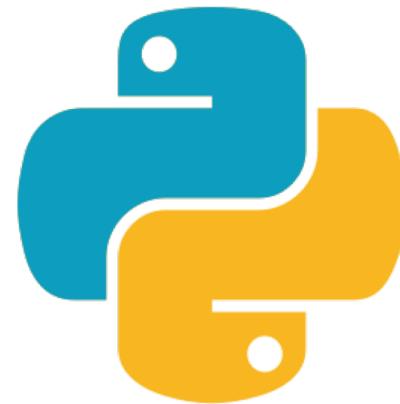
The screenshot shows a Python Shell window with the title "76 Python Shell". The menu bar includes File, Edit, Shell, Debug, Options, Windows, and Help. The console output shows Python 3.2.3 running on win32. It demonstrates dynamic typing by creating a string and checking its type, and then creating a list and checking its type.

```
File Edit Shell Debug Options Windows Help
Python 3.2.3 (default, Apr 11 2012, 07:15:24) [MS
on win32
Type "copyright", "credits" or "license()" for mo
>>> string1 = "Good Morning"
>>> type(string1)
<class 'str'>
>>> number_list = [1, 123, 12.5, -500]
>>> type(number_list)
<class 'list'>
```

HADOOP



PYTHON



Why the name Python?

Monty Python circus

BBC from 1969 -1974



Borrowed all the concept

- Functional programming from C
- OOPs from C++
- Scripting from Perl and shell script
- Modular features from Modula 3
- Syntax from C and ABC Language

Why Python?

10. Simple & Easy To Learn



Open Source

```
a=3  
b=5  
Sum=a+b
```

High-level



Interpreted



Large community

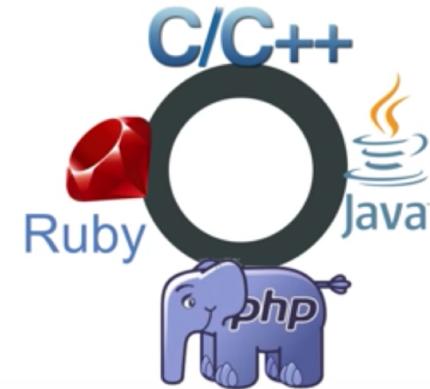
Java

```
public class HelloWorld {  
    public static void main(String[] args) {  
        System.out.println("Hello, world");  
    }  
}
```

Python

```
print("Hello, world")
```

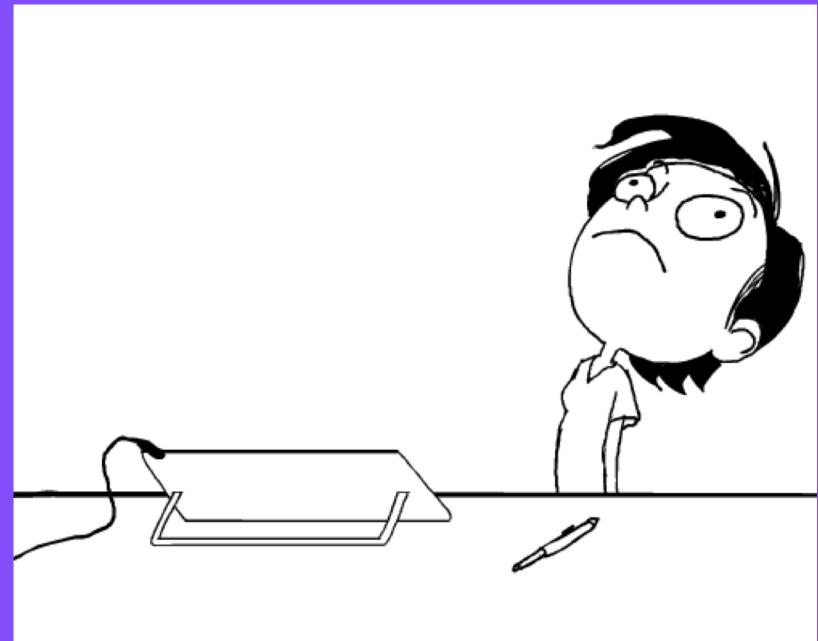
It's that **SIMPLE!**



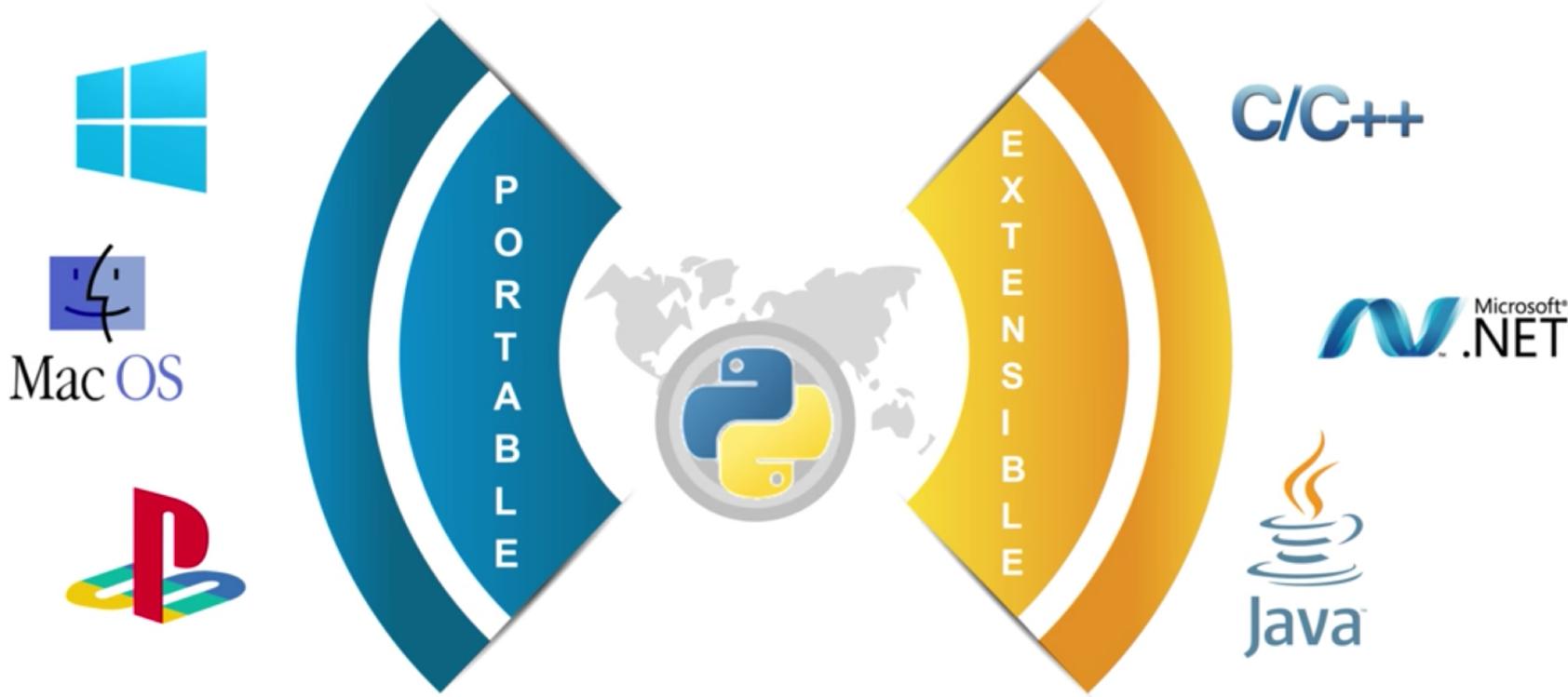
Programmer



Non Programmer



9. Portable & Extensible



8. Web Development



- Develop web applications
- Scrape websites

Frameworks

django



Flask



Pylons™

WEB2PY

7. Artificial Intelligence

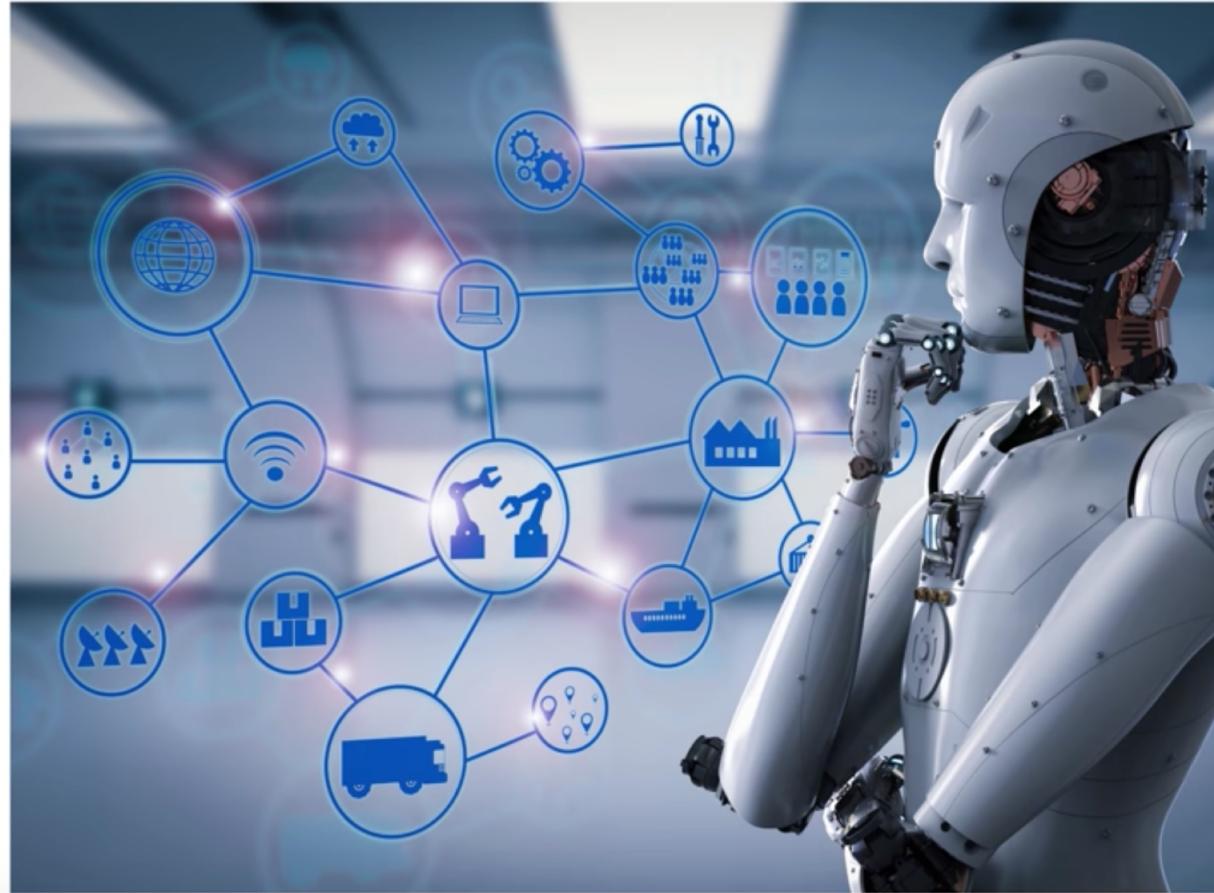
Libraries

 Scikit-learn

 Keras

 Tensorflow

 OpenCV



6. Computer Graphics

➤ Graphical User Interface

➤ Desktop applications

➤ Game development

Libraries

TK
Tkinter



5. Testing Frameworks

- Python supports testing with cross-platform & cross-browser
- Built in testing framework which covers debugging time and fastest workflows

Tools



Splinter

Framework



pytest



4. Big Data

- Python handles **BIG DATA!**
- Python supports parallel computing
- You can write **MapReduce** codes in Python

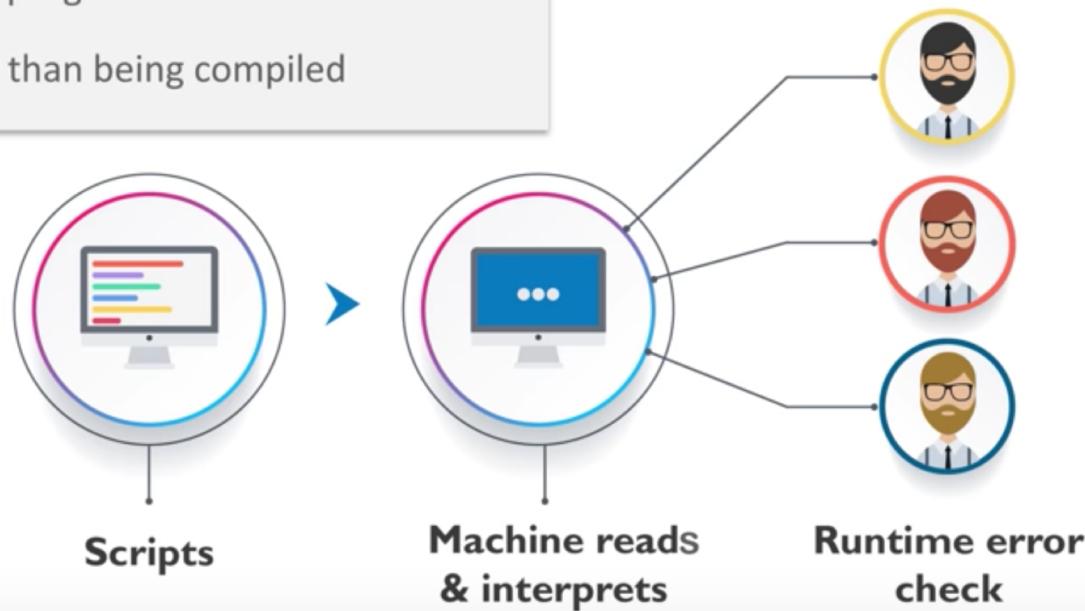
Libraries



3. Scripting: Automation



- It is the most popular **scripting** language in the industry
- **Automate** certain tasks in a program
- They are **interpreted** rather than being compiled



2. Data Science



- Well-suited for data **manipulation & analysis**
- Deals with **tabular** data with heterogeneously-typed columns
- Arbitrary **matrix** data
- Observational/ **statistical** datasets

Libraries



NumPy



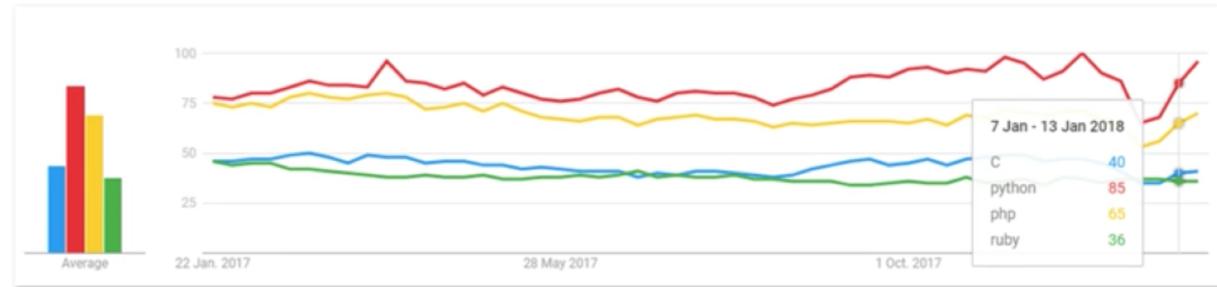
Pandas



seaborn

1. Popularity & High Salary

USD \$116,028



Big Giants



Google

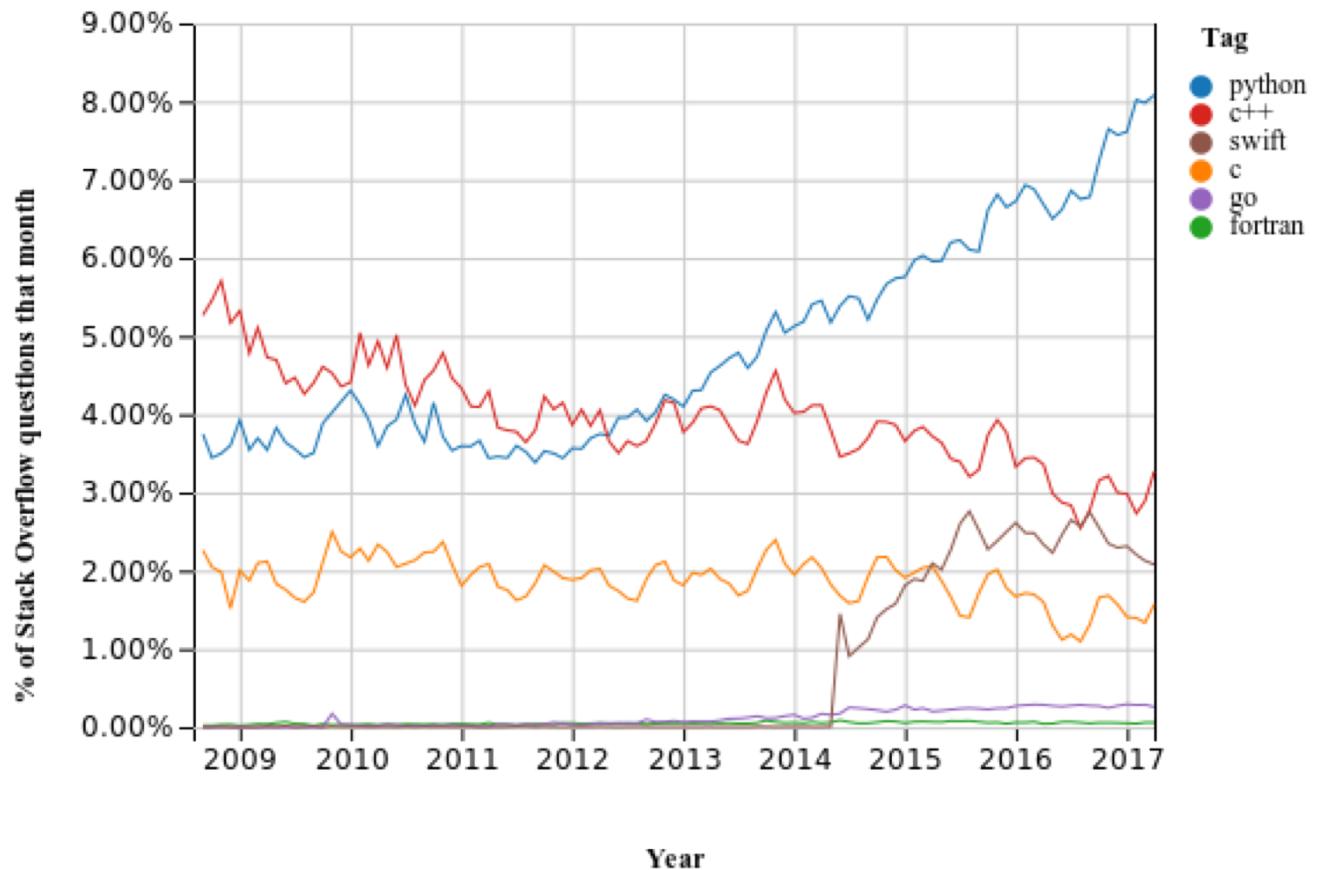


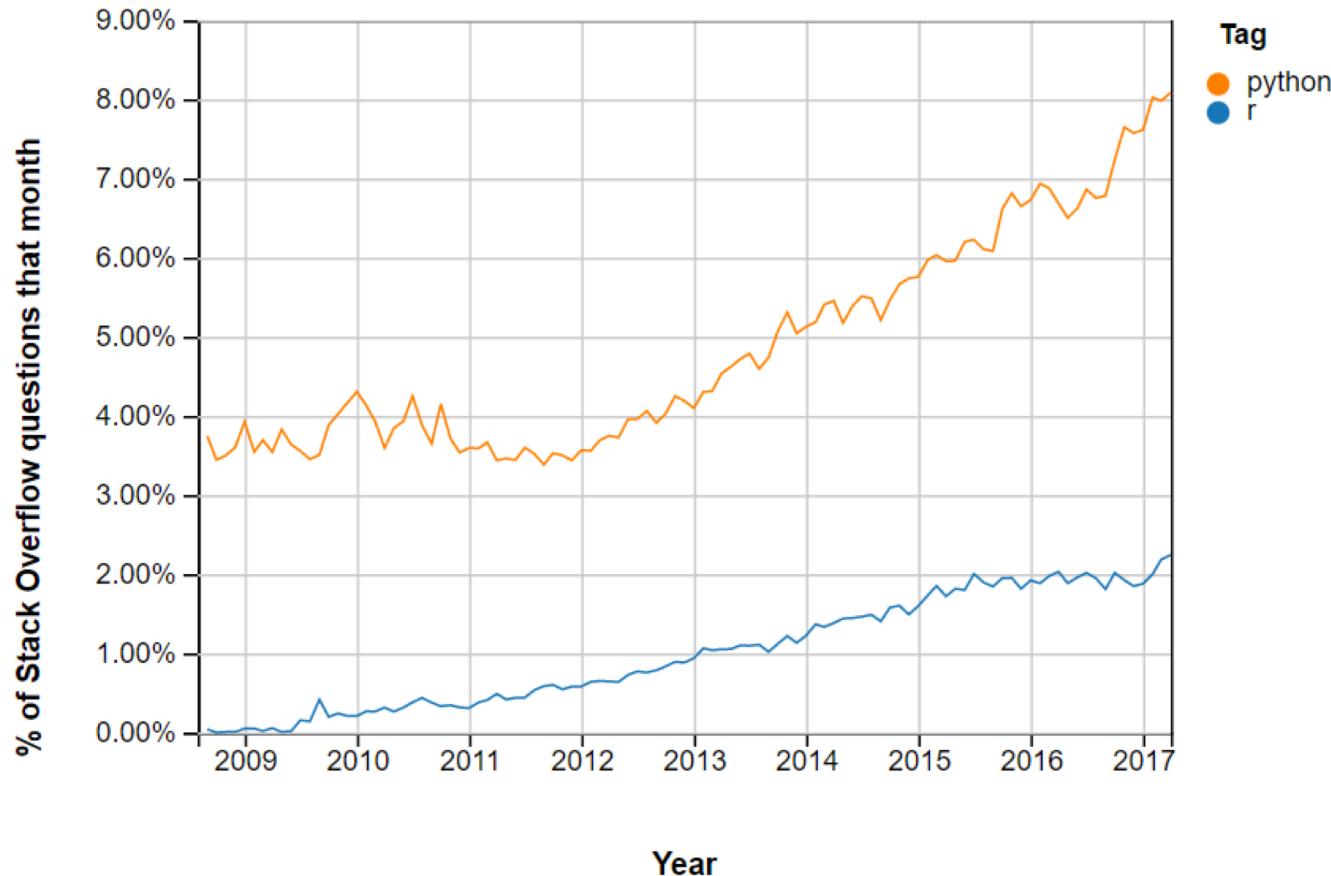
YouTube



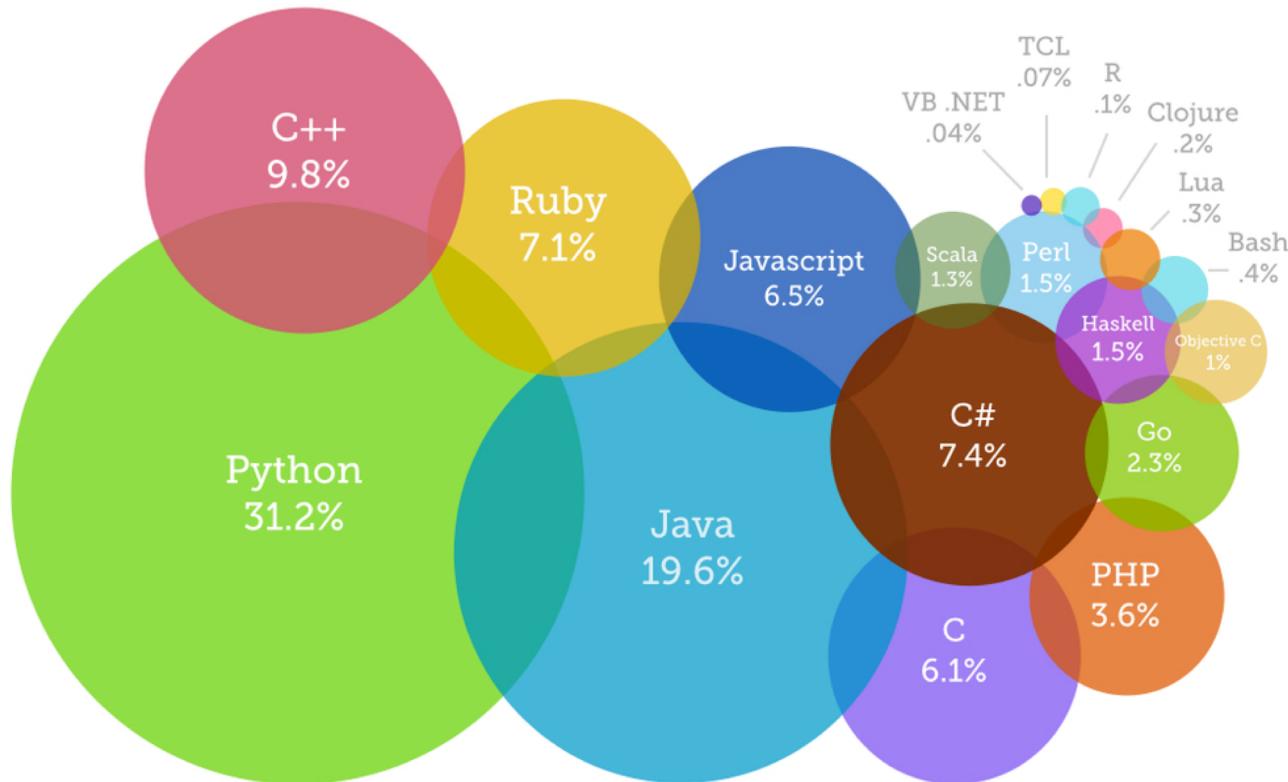
facebook.







Most Popular Coding Languages of 2015



Which companies using python?

Who all are using Python?



YAHOO!

Google

YouTube



reddit



IBM



redhat

CANONICAL

NETFLIX

Quora



and the list goes on...

Flavours of Python



- CPython – Cython
- JPython – Jython
- IronPython
- PyPy - Performance using JIT
- RubyPython
- Anaconda
- Stackless(Python for concurrency)

Version of Python

- Python 1 introduced in Jan 1994
- Python 2.0 introduced in Oct 2000
- Python 3.0 introduced in Dec 2008

Any new version should provide support for old version program
Exception in python

Python 3 is not backward compatibility with Python 2

Python 2 support is not supported after 2020

Disadvantages of Python

- Weak in mobile computing
- Get slow in speed
- Run time errors
- Underdeveloped Database access layers

trying to learn any
programming language 100%

come on

just a little
bit more

almost there

oh crap...

Anaconda Installation

Environment to run Python

- **Immediate mode - cmd-
python**
- **Script mode - python file.py**
- **IDE - Integrated
Developement environment-
spyder, pycharm, jupyter
notebook**



For coding
refer GitHub repository

THANK YOU