Why Python is a good tool for data mining

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CS548

Why Python is a ~~good~~ better tool for data mining

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References

- Python (programming language): http://en.wikipedia.org/wiki/Python_(programming_language)
- When You Write Your Essays in Programming Languages: http://www.somethingofthatilk.com/index.php?id=135
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- Pricing and Licensing: http://www.mathworks.com/pricing-licensing/
- Pricing Options: http://rapidminer.com/pricing/
- PythonForArtificialIntelligence: https://wiki.python.org/moin/PythonForArtificialIntelligence
- How To Read And Parse CSV File In Java: http://www.mkyong.com/java/how-to-read-and-parse-csv-file-in-java/

Tools for data mining

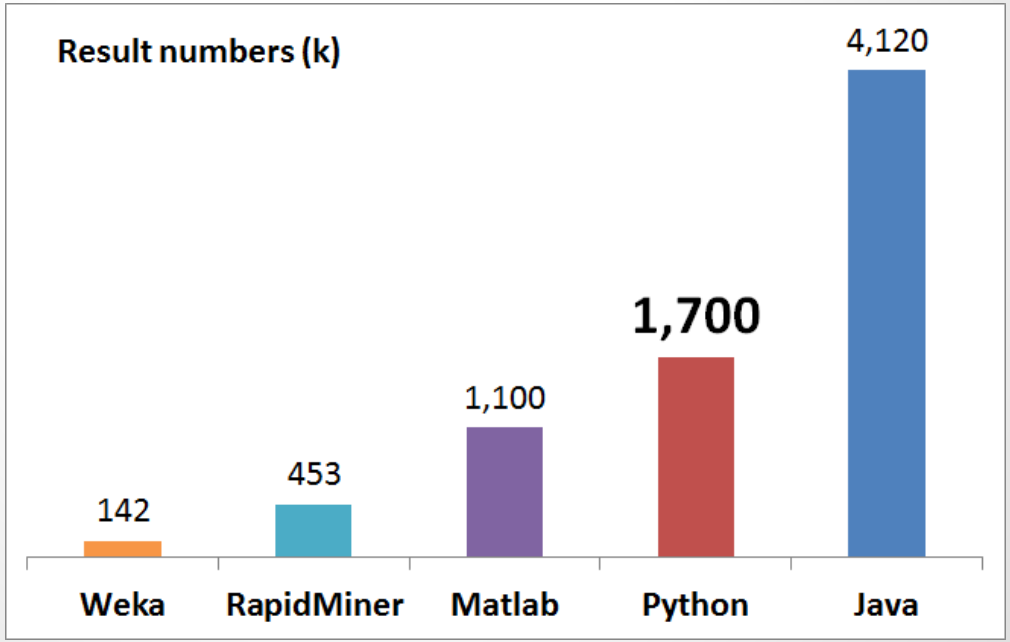
We have learned to use a lot tools

Weka, RapidMiner, Matlab ...

What tools are being used in the real word?

Tools for data mining?

Ask Google: *data mining job requirements + <tool name>*

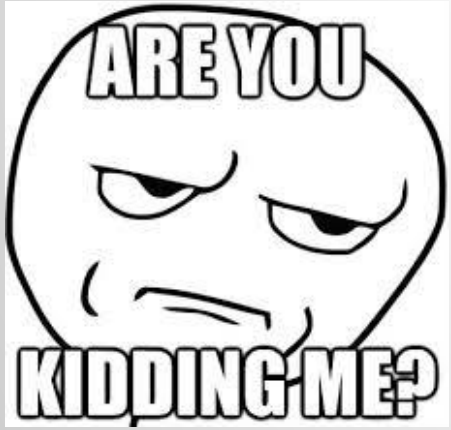


Why I think Python is a better tool?

Free!

Matlab: $50 - $2600

RapidMiner: $999/yr - $2999/yr!!



Why I think Python is a better tool?

Simple: better than Java

Readability is the core philosophy

```python
# load data from a csv file
data = array([map(float, row) \
    for row in reader(open("ads.csv", "r"))])
```

VS

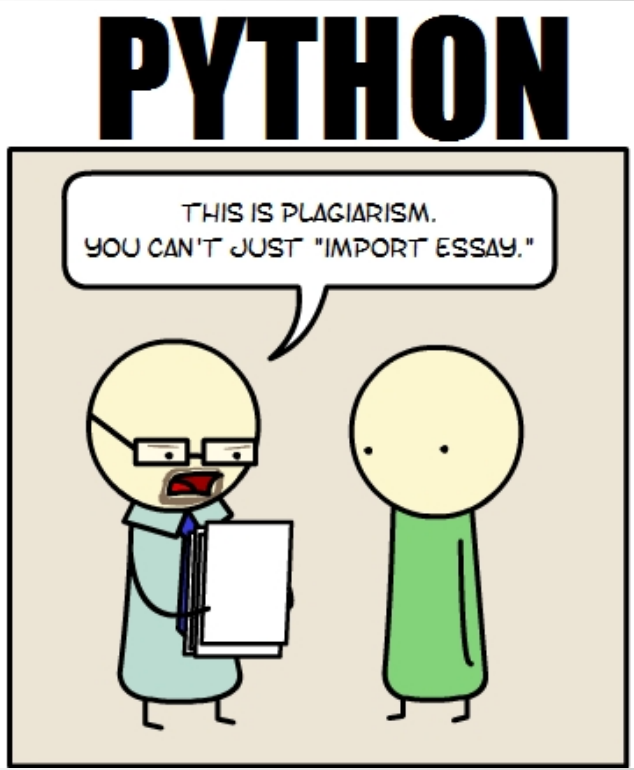
```java
public class ReadCVS {

  public static void main(String[] args) {

        ReadCVS obj = new ReadCVS();
        obj.run();

  }

  public void run() {

        String csvFile = "/Users/mkyong/Downloads/GeoIPCountryWhois.csv";
        BufferedReader br = null;
        String line = "";
        String cvsSplitBy = ",";

        try {

                br = new BufferedReader(new FileReader(csvFile));
                while ((line = br.readLine()) != null) {

                        // use comma as separator
                        String[] country = line.split(cvsSplitBy);

                        System.out.println("Country [code= " + country[4]
                                + " , name=" + country[5] + "]");

                }
```

Why I think Python is a better tool?

Powerful: better than many

Anything you can think of, there is a library for that - over 20 libraries for Data mining

- Web programing
- Large scale data processing for big data
- Image/Audio processing
- ...



Why I think Python is a better tool?

Object Oriented:

Because it is a real programming language

Open Source:

So you can help to improve it

Example: K-means using Python

1. Load data from a csv file
2. Define K-means clustering
3. Fit the data to K-means
4. Plot the clusters in a 3D space

Example: K-means using Python

Load csv data:

```
# load data from a csv file
data = array([map(float, row) for row in reader(open("ads.csv", "r")
```

Define K-means clustering:

```
# define kmeans parameters
k_means = KMeans(init='k-means++', n_clusters=2, n_init=10)
```

Example: K-means using Python

Fit the data to K-means:

```
# fit the data with kmeans clustering
k_means.fit(data)
```

Return the labels of every points

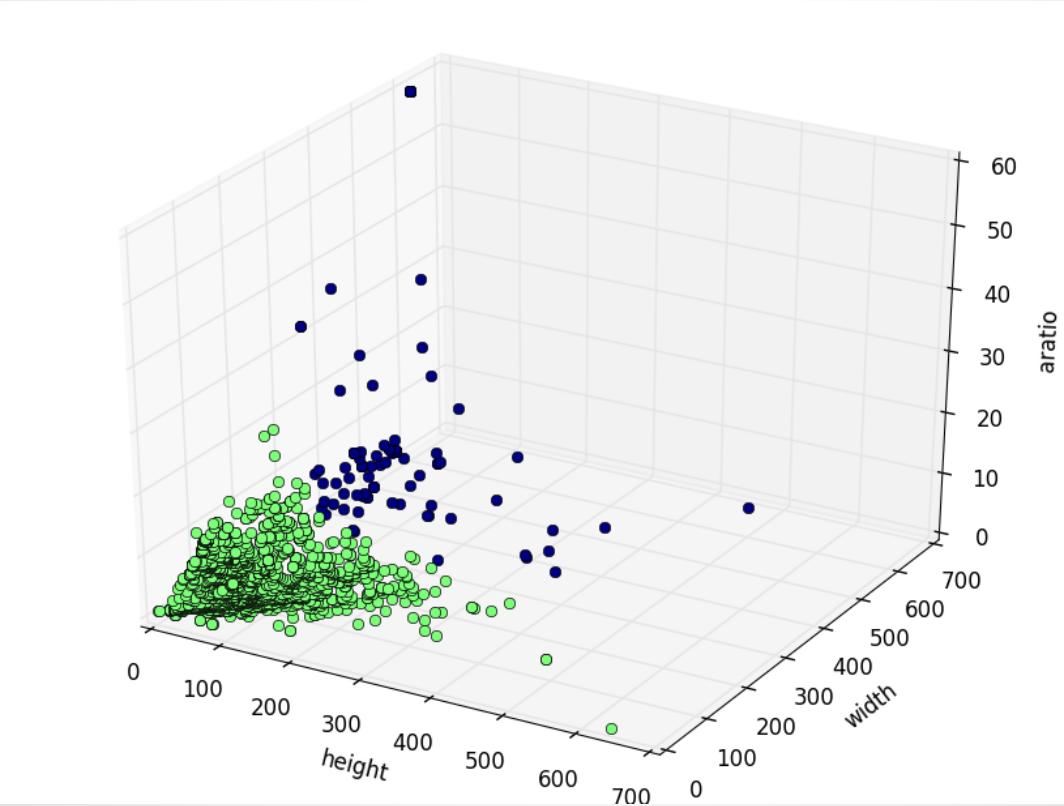
```
# get the cluster labels
label = k_means.labels_
```

Example: K-means using Python

Plot the clusters in a 3D space

```
# plot the clusters in a 3d space
fig = pl.figure()
ax = p3.Axes3D(fig)
for l in np.unique(label):
    ax.plot3D(data[label == l, 0], data[label == l, 1], data[label == l, 2],
              'o', color=pl.cm.jet(np.float(l) / np.max(label + 1)))
```

Example: K-means using Python



Thank you and one more thing

Need a dataset? Try: https://www.kaggle.com/