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1 Project description

1.1 General Description

Goal : Find jobs

1.1.1 Use

1. target opportunities
   (a) sheets of wanted words
   (b) query matching algorithms
2. data exploration
3. cluster
   (a) nlp
4. find jobs I didn't know about

5. get warned if new opportunities
6. use it as a model for finding my perfect match in the world / exploring the economy
7. make it open source and useable by anyone

1.1.2 Features

1. Update
2. Clustering
3. Visualization

1.2 Plan

1.2.1 Ebay jobs quick scrap

1. Think about it while normal digging
2. Build a simple tool to access the info offline and stay up to date
3. List the wanted features and their learning prerequisites

1.2.2 Blogging

1. Org babel
2. Website

1.2.3 Courses

1. Databases
2. Visualization
3. Machine learning
4. NLP
5. Hash tables / numpy computation
6. Proba / stats

1.2.4 Jobs seeker

1.3 Implementation

1.3.1 Start a clean project

1. **TODO** git
   (a) a branch per functionality
2. **TODO** projectile
3. file system
   (a) /
      i. org
      ii. scraper
      iii. database
      iv. explorer
4. database
   (a) sql ?
   (b) csv ?
5. org babel file / emacs env
   (a) snippets C-c & ... Tables C-c C-t is snippet mode for test
   (b) **TODO** track time
   (c) track habits
   (d) decide what goes public and what does not at expension

2 Explorer

Proper program.

2.1 Imports

2.1.1 ipython

```
%matplotlib inline
import matplotlib.pyplot as plt
import numpy as np
```

2.1.2 pandas

```
import pandas as pd
```

2.2 Data load

2.2.1 load everything

1. file list with path

```
import os
csv_files = []
for dirpath, dirs, files in os.walk("../data/raw"):
  for filename in files:
    fname = os.path.join(dirpath,filename)
    if fname.endswith('.csv'):
      csv_files.append(fname)
```

```
['bücherei.csv',
'anfänger.csv',
'digital art.csv',
'graphql.log',
'google trends.log',
'jenkins.log',
'cuisine.csv',
'blumen.csv',
'computer vision.csv',
'küchenhilfe.csv',
'scrapping.csv',
'pilzen.csv',
'virtual reality.csv',
'google trends.csv',
'vr.csv',
'computer vision.log',
'mushrooms.csv',
'docker.log',
'advertisment.csv',
'buchhandel.csv',
'flowers.csv',
'digital artist.csv',
'graphql.csv',
```

```
'yoga.csv',
'jenkins.csv',
'museum.csv',
'advertisement.csv',
'küche.csv',
'fintech.csv',
'flower.csv',
'movie.csv',
'restaurant.csv',
'crackers.csv',
'docker.csv',
'bio.csv',
'crackers.log',
'garden.csv',
'short movie.csv',
'gardening.csv',
'schneiderei.csv',
'heroku.csv',
'hammam.csv',
'advertisement.log',
'kunst und medien.csv',
'spa.csv']
```

2. dataframe creation

```
jobs = pd.DataFrame()

for fl in csv_files:
    print(fl+(30-len(fl)//2)*" *")
    try:
        jobs_set = pd.read_csv(fl)
        jobs_set.dropna(axis=0, how='any', subset=["desc"], inplace=True)
        jobs_set.drop_duplicates(subset="desc", inplace=True)
        try:
            jobs.iloc[0,0]
            jobs = jobs.append(jobs_set)
        except IndexError:
            jobs = jobs_set
    except pd.errors.EmptyDataError:
        pass
```

3. **TODO** time range selection

2.2.2 rename

use to quickly reset original df

```
df = jobs
```

2.2.3 python example TEST

```
x = 12
return x
```

```
return int(x)+1
```

2.2.4 org doc elisp example TEST

1
2
3
4

```
(length table)
```

2.2.5 python PYTHON

```
"~/data/projects/jobseeker/data/raw/18-09-07/dsp.csv"
```

```
   None
```

```
"~/data/projects/jobseeker/data/raw/18-09-07/dsp.csv"
```

```
   None
```

```
"~/data/projects/jobseeker/data/raw/18-09-07/python.csv"
```

```
   None
```

```
"~/data/projects/jobseeker/data/raw/18-09-07/data scientist.csv"
```

```
   None
```

```
"~/data/projects/jobseeker/data/raw/18-09-07/software engineer.csv"
```

```
   None
```

2.3 Manipulation

2.3.1 Pioneer

1. get data from path as org variable

```
import pandas as pd
df = pd.read_csv(data)
```

2. infos about data

```
df.count()
```

3. show short data insight

   (a) raw pandas output

```
df.head()
```

4. browse offers

   (a) add custom function to pretyfy

```
from bs4 import BeautifulSoup

def souper(html):
    soup = BeautifulSoup(html, 'html.parser')
    print(soup.get_text())


def soupprint(df, begin, end):
    for i in range(begin, end):
        print(i, df.title.iloc[i])
        print("\n")
        print(df.company.iloc[i])
        print("\n")
        souper(df.desc.iloc[i])
        print("\n"*3)
        print("-"*100)
        print("\n"*3)
```

   (b) print it !

```
soupprint(head,0,3)
```

2.3.2 cleansing CLEAN

1. duplicates
   (a) $\text{drop}_{\text{duplicates}}$
   ```
   df.drop_duplicates(subset="desc", inplace=True)
   ```
   (b) count
   ```
   df.title.count()
   ```
   ```
   11636
   ```
2. olders
   (a) map lambda TEST
   ```
   df = df[df.days_ago.str.contains("30+").map(lambda x: not x)]
   ```
   (b) ~ TEST
   ```
   df = ~df[df.days_ago.str.contains("30+")]
   ```
   (c) ==False
   ```
   df = df[df.days_ago.str.contains("30+")==False]
   ```
   (d) count
   ```
   len(df)
   ```
   ```
   5578
   ```
3. string numbers to integers
   (a) sol
   ```
   df["days_ago"] = df.days_ago.apply(lambda x: int(x))
   ```
   (b) test
   ```
   df.days_ago.iloc[12]
   ```
   ```
   3
   ```
4. drop erratic values
   (a) run
   ```
   df = df[df.days_ago.lt(30)]
   ```

(b) tests

```
df.days_ago.lt(30)
```

```
3      True
12     True
14     True
15     True
19     True
23     True
27     True
28     True
35     True
38     True
45     True
48     True
55     True
57     True
59     True
62     True
63     True
64     True
65     True
66     True
75     True
79     True
82     True
87     True
91     True
92     True
93     True
94     True
96     True
100    True
...
44     True
46     True
49     True
54     True
55     True
65     True
```

```
68     True
69     True
70     True
74     True
77     True
82     True
84     True
87     True
89     True
90     True
93     True
95     True
96     True
97     True
102    True
105    True
109    True
115    True
116    True
119    True
121    True
124    True
126    True
2      True
Name: days_ago, Length: 1625, dtype: bool
```

2.3.3 filtering

1. look for keywords
   (a) keyword definiton
      i. org variable
      `"kunst und medien"`
      kunst und medien
   (b) look in title
      i. boolean serie construction TEST
      `df.title.str.contains(k, case=False)`

```
3      False
12     False
```

```
14     False
15     False
19     False
23     False
27     False
28     False
35     False
38     False
45     False
48     False
55     False
57     False
59     False
62     False
63     False
64     False
65     False
66     False
75     False
79     False
82     False
87     False
91     False
92     False
93     False
94     False
96     False
100    False
...
44     False
46     False
49     False
54     False
55     False
65     False
68     False
69     False
70     False
74     False
77     False
```

```
82     False
84     False
87     False
89     False
90     False
93     False
95     False
96     False
97     False
102    False
105    False
109    False
115    False
116    False
119    False
121    False
124    False
126    False
2      False
Name: title, Length: 1623, dtype: bool
```

ii. reduction of our dataset

```
df = df[df.title.str.contains(k, case=False, na=False)]
```

(c) look in description

```
df = df[df.desc.str.contains(k, case=False, na=False)]
```

(d) **TODO** test goto Johnny Kitchin

```
k
```

```
"# Out[91]:\n: 'database'"
```

2. companies

```
df = df[df.company.str.contains("berlin", case=False, na=False)]
```

2.4 Stats

2.4.1 overview

1. head

```
df.head()
```

```
Empty DataFrame
Columns: [location, related, title, url, company, days_ago, contract, desc]
Index: []
```

2. count

```
len(df)
```

```
0
```

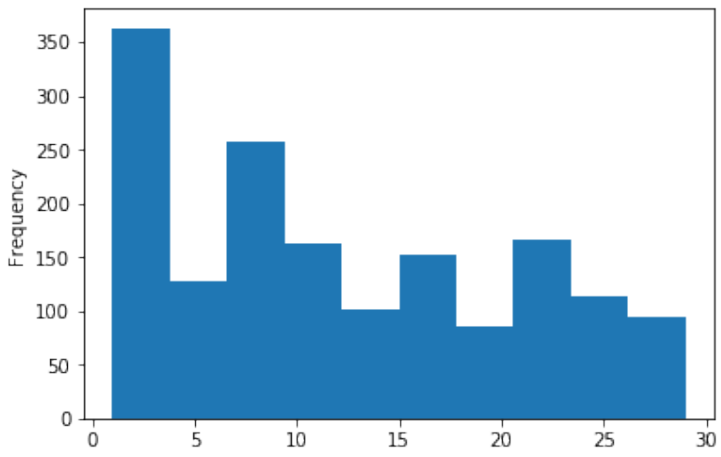
2.4.2 days ago

1. histogram

   (a) pd plot

```
df.days_ago.plot.hist()
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f1136869c18>
```



2. value count

```
df.days_ago.value_counts()
```

```
3     136
1     125
9     115
```

```
2     109
8      80
7      74
4      71
10     70
23     68
11     68
14     68
24     57
17     56
16     55
21     55
18     52
15     48
22     47
25     46
28     40
6      39
29     38
13     35
12     28
5      23
27     20
20     19
19     16
26     13
46      1
56      1
Name: days_ago, dtype: int64
```

3. groupby

   (a) basic output

   ```
   df.groupby(["days_ago"]).groups
   ```

   ```
   {1: Int64Index([20, 25, 49, 136], dtype='int64'),
   2: Int64Index([2, 4, 10, 30, 71, 77, 116, 125, 139], dtype='int64'),
   3: Int64Index([27, 54, 73, 98, 106, 128], dtype='int64'),
   4: Int64Index([29, 32, 60, 97, 114, 119, 143], dtype='int64'),
   5: Int64Index([50, 135], dtype='int64'),
   ```

```
6: Int64Index([129], dtype='int64'),
7: Int64Index([127], dtype='int64'),
8: Int64Index([104, 112, 113, 121, 138], dtype='int64'),
9: Int64Index([142], dtype='int64'),
10: Int64Index([3, 96], dtype='int64'),
11: Int64Index([86, 132], dtype='int64'),
12: Int64Index([109], dtype='int64'),
13: Int64Index([31], dtype='int64'),
14: Int64Index([22, 24, 95], dtype='int64'),
16: Int64Index([47], dtype='int64'),
17: Int64Index([6, 37, 41], dtype='int64'),
18: Int64Index([80], dtype='int64'),
20: Int64Index([79], dtype='int64'),
21: Int64Index([55], dtype='int64'),
22: Int64Index([1, 144], dtype='int64'),
23: Int64Index([21, 52, 75, 110], dtype='int64'),
24: Int64Index([66, 67], dtype='int64'),
25: Int64Index([14], dtype='int64'),
26: Int64Index([91], dtype='int64'),
27: Int64Index([48], dtype='int64'),
29: Int64Index([145], dtype='int64')}
```

(b) loop print

```
grouped = df.groupby("days_ago")

for name,group in grouped:
    print(name)
    print(group)
```

(c) documentation DOC

i. pandas doc

```
help(df.groupby(["days_ago"]))
```

Help on DataFrameGroupBy in module pandas.core.groupby object:
class DataFrameGroupBy(NDFrameGroupBy)

Class for grouping and aggregating relational data. See aggregate, transform, and apply functions on this object.

It's easiest to use obj.groupby(...) to use GroupBy, but you can also do:

::

grouped = groupby(obj, ...)

Parameters
———-
obj : pandas object
axis : int, default 0
level : int, default None
Level of MultiIndex
groupings : list of Grouping objects
Most users should ignore this
exclusions : array-like, optional
List of columns to exclude
name : string
Most users should ignore this

Notes
——
After grouping, see aggregate, apply, and transform functions. Here are some other brief notes about usage. When grouping by multiple groups, the result index will be a MultiIndex (hierarchical) by default.

Iteration produces (key, group) tuples, i.e. chunking the data by group. So you can write code like:

::

grouped = obj.groupby(keys, axis=axis)
for key, group in grouped:
# do something with the data

Function calls on GroupBy, if not specially implemented, "dispatch" to the grouped data. So if you group a DataFrame and wish to invoke the std() method on each group, you can simply do:

::

df.groupby(mapper).std()

rather than

::

ii. tutorial `https://www.tutorialspoint.com/python_pandas/python_pandas_groupby.htm`

(d) use

```
grouped = df.groupby(["days_ago"])
grouped.title.count().sort_values(ascending=False)
```

```
days_ago
2     9
4     7
3     6
8     5
1     4
23    4
17    3
14    3
10    2
24    2
22    2
5     2
11    2
6     1
7     1
9     1
29    1
12    1
27    1
16    1
18    1
20    1
21    1
25    1
26    1
13    1
Name: title, dtype: int64
```

2.4.3 companies

1. groupby

   (a) define group

```
comp_group = df.groupby(["company"])
```

(b) print groups

```
comp_group.groups
```

```
{'All My Homes': Int64Index([104], dtype='int64'),
'Ares Tech GmbH': Int64Index([80], dtype='int64'),
'Arweave': Int64Index([113], dtype='int64'),
'Asana Rebel': Int64Index([47], dtype='int64'),
'Atfarm': Int64Index([22], dtype='int64'),
'Atos': Int64Index([14], dtype='int64'),
'Avabis GmbH': Int64Index([135], dtype='int64'),
'BankenScore.de': Int64Index([132], dtype='int64'),
'BigchainDB': Int64Index([143], dtype='int64'),
'Bosch Software Innovations': Int64Index([139], dtype='int64'),
'CGI': Int64Index([121], dtype='int64'),
'Carmeq GmbH': Int64Index([2, 4, 10, 125], dtype='int64'),
'Conrad Electronic': Int64Index([50], dtype='int64'),
'Detecon': Int64Index([60], dtype='int64'),
'Deutsche Telekom AG, VTI': Int64Index([79], dtype='int64'),
'Door2Door': Int64Index([30], dtype='int64'),
'Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut': Int64I
'Freie Universität': Int64Index([119], dtype='int64'),
'GIM - Gesellschaft für Innovative Marktforschung mbH': Int64Index([71], dtyp
'Get It Done': Int64Index([106], dtype='int64'),
'Goldland Media GmbH': Int64Index([116], dtype='int64'),
'Hays': Int64Index([20], dtype='int64'),
'HelloFresh': Int64Index([109], dtype='int64'),
'JLink connecting experts GmbH': Int64Index([29], dtype='int64'),
'Joblift GmbH': Int64Index([73], dtype='int64'),
'KLEO Connect': Int64Index([95], dtype='int64'),
'Klarna': Int64Index([145], dtype='int64'),
'Lesara GmbH': Int64Index([41], dtype='int64'),
'Menzel IT GmbH': Int64Index([112], dtype='int64'),
'Modis GmbH': Int64Index([24, 37], dtype='int64'),
'NVIDIA': Int64Index([142], dtype='int64'),
'Novate IT Ltd': Int64Index([27], dtype='int64'),
'Planet Expat': Int64Index([97], dtype='int64'),
'Project A Ventures': Int64Index([32, 49, 86], dtype='int64'),
'Publicis Pixelpark': Int64Index([77], dtype='int64'),
```

```
'Qtixx GmbH': Int64Index([1], dtype='int64'),
'Rakuten Deutschland GmbH': Int64Index([129], dtype='int64'),
'Relayr': Int64Index([128], dtype='int64'),
'ResearchGate GmbH': Int64Index([31], dtype='int64'),
'Retresco': Int64Index([114], dtype='int64'),
'Scout24': Int64Index([75], dtype='int64'),
'Sixt GmbH & Co. Autovermietung KG': Int64Index([6], dtype='int64'),
'Sparkassen-Finanzportal GmbH': Int64Index([52], dtype='int64'),
'Sparks42': Int64Index([48], dtype='int64'),
'Technische Universität Berlin': Int64Index([138], dtype='int64'),
'Tillhub Gmbh': Int64Index([98], dtype='int64'),
'Twilio': Int64Index([21], dtype='int64'),
'Two Visions Consulting OHG': Int64Index([67], dtype='int64'),
'TÜV Rheinland Group': Int64Index([55], dtype='int64'),
'Upvest': Int64Index([96], dtype='int64'),
'Volkswagen AG': Int64Index([127], dtype='int64'),
'YEAY GmbH': Int64Index([66], dtype='int64'),
'car2go Group GmbH': Int64Index([110], dtype='int64'),
'eBay Inc.': Int64Index([3], dtype='int64'),
'mytaxi!': Int64Index([54], dtype='int64'),
'omni:us': Int64Index([25], dtype='int64'),
'scondoo GmbH': Int64Index([91], dtype='int64'),
'solvemate GmbH': Int64Index([136], dtype='int64')}
```

(c) count groups

```
len(comp_group.groups)
```

```
58
```

(d) number of job per company

i. hack

A. loop

```
for company in comp_group.groups.keys():
            lenght = len(comp_group.groups[company])
            if lenght > 1:
                        print(company, lenght)
```

B. single

```
key = list(comp_group.groups.keys())[0]
list(comp_group.groups[key])
```

```
[32, 49, 86]
```

C. test

```
len(comp_group.groups["Fraunhofer-Institut für Nachrichtentechnik, Hei
1
```

ii. pandas

```
count = comp_group.title.count()
count.sort_values(ascending=False)
```

```
company
Carmeq GmbH                                                    4
Project A Ventures                                             3
Modis GmbH                                                     2
solvemate GmbH                                                 1
Door2Door                                                      1
KLEO Connect                                                   1
Joblift GmbH                                                   1
JLink connecting experts GmbH                                  1
HelloFresh                                                     1
Hays                                                           1
Goldland Media GmbH                                            1
Get It Done                                                    1
GIM - Gesellschaft für Innovative Marktforschung mbH           1
Freie Universität                                              1
Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut    1
Deutsche Telekom AG, VTI                                       1
Lesara GmbH                                                    1
Detecon                                                        1
Conrad Electronic                                              1
CGI                                                            1
Bosch Software Innovations                                     1
BigchainDB                                                     1
BankenScore.de                                                 1
Avabis GmbH                                                    1
Atos                                                           1
Atfarm                                                         1
Asana Rebel                                                    1
Arweave                                                        1
Ares Tech GmbH                                                 1
Klarna                                                         1
Menzel IT GmbH                                                 1
```

```
scondoo GmbH                                  1
Technische Universität Berlin                 1
omni:us                                       1
mytaxi!                                       1
eBay Inc.                                     1
car2go Group GmbH                             1
YEAY GmbH                                     1
Volkswagen AG                                 1
Upvest                                        1
TÜV Rheinland Group                           1
Two Visions Consulting OHG                    1
Twilio                                        1
Tillhub Gmbh                                  1
Sparks42                                      1
NVIDIA                                        1
Sparkassen-Finanzportal GmbH                  1
Sixt GmbH & Co. Autovermietung KG             1
Scout24                                       1
Retresco                                      1
ResearchGate GmbH                             1
Relayr                                        1
Rakuten Deutschland GmbH                      1
Qtixx GmbH                                    1
Publicis Pixelpark                            1
Planet Expat                                  1
Novate IT Ltd                                 1
All My Homes                                  1
Name: title, dtype: int64
```

2. value count

```
df.company.value_counts()
```

```
Status                7
ZipJet                7
MVP Factory           6
Zattoo                5
virtualQ GmbH         5
Hays                  5
8fit                  5
```

SumUp	4
Relayr	4
Opitz Personalberatung	4
Book a Street Artist	4
nteam GmbH	3
trecker.com	3
unu GmbH	3
medneo GmbH	3
Chatterbug	3
SmartRecruiters Inc	3
SAP	3
YARA Digital Farming Niederlassung YARA GmbH&Co KG	3
Computer Manufaktur	3
blogfoster	3
DATAGROUP Inshore Services GmbH	3
Planet	3
Oracle	3
flowkey GmbH	3
Cogs Agency	2
Bidmanagement	2
Ares Tech GmbH	2
media.net berlinbrandenburg	2
Mirantis	2
..	
Mason Bedford	1
YND Consult GmbH	1
DB	1
Translation Royale	1
perZukunft	1
Cornerstone Search Group, LLC	1
Bloomberg	1
data Artisans	1
CORE	1
Brandnew IO	1
OLX Group	1
Plexus Resource Solutions	1
Catapult	1
Transparency International Secretariat	1
GS-Company	1
Rekode	1

```
HubSpot                                                 1
Shishi                                                  1
Headmatch                                               1
White & Case                                            1
AUTO1                                                   1
mmpro film- und medienproduktion GmbH                   1
Native Instruments                                      1
Productsup                                              1
Imperva                                                 1
Data Artisans                                           1
Groupon                                                 1
Heaven Media Ltd                                        1
CANCOM SE                                               1
AirHelp                                                 1
Name: company, Length: 194, dtype: int64
```

2.5 Words

2.5.1 most used word

1. category to look in

   ```
   "desc"
   ```

2.

2.6 Printing

2.6.1 quick overview

1. head

   ```
   df.head()
   ```

   ```
   location                                               related  \
   0   Berlin  https://de.indeed.com/Python-Developer-Jobs-in...
   1   Berlin                                                 NaN
   2   Berlin  https://de.indeed.com/Senior-Software-Tester-J...
   3   Berlin  https://de.indeed.com/Lead-Product-Analyst-Job...
   4   Berlin  https://de.indeed.com/Softwareentwickler-Entwi...
   ```

```
title  \
0                             Python Developer (m/w)
1                            Software-Entwickler w/m
2                      Senior Software-Tester (w/m)
3                               Lead Product Analyst
4  Softwareentwickler (m/w) für Entwicklungsumgeb...

url        company days_ago  \
0  https://de.indeed.com/viewjob?jk=05f2b8ca5157f...  Bidmanagement      30+
1  https://de.indeed.com/cmp/Qtixx-GmbH/jobs/Soft...     Qtixx GmbH       22
2  https://de.indeed.com/viewjob?jk=d9b44d35ab5be...    Carmeq GmbH        2
3  https://de.indeed.com/viewjob?jk=9b572e61f1945...      eBay Inc.       10
4  https://de.indeed.com/viewjob?jk=c181a1609f4bb...    Carmeq GmbH        2

contract                                                  desc
0       NaN  <span id="job_summary" class="summary"><div><d...
1       NaN  <span id="job_summary" class="summary"><p>Die ...
2       NaN  <span id="job_summary" class="summary"><div><d...
3       NaN  <span id="job_summary" class="summary"><div><p...
4       NaN  <span id="job_summary" class="summary"><div><d...
```

2. count

```
df.title.count()
```

```
146
```

3. titles

```
df.title
```

2.6.2 html pages

1. hacked around solution TEST

   (a) function to save results to html

```
from datetime import datetime
from os import mkdir

def htmlexport(df, begin, end):
```

```
date = str(datetime.now())
path = "../reports/html/" + date + "/"
mkdir(path)
for i in range(begin, end):
            html = ""
            html = html + "\n"
            html = html + "Job number " + str(i)
            html = html + "\n"
            html = html + "-"*100
            html = html + "\n" + df.title.iloc[i]
            html = html + "\n"
            html = html + df.company.iloc[i]
            html = html + "\n"
            html = html + "-"*100
            html = html + "\n"
            html = html + df.desc.iloc[i]
            html = html + "\n"*3
            html = html + "-"*100
            html = html + "\n"*3
            filename = path + "job-" + str(i) + ".html"
            with open(filename, "a") as file:
                        file.write(html)
```

(b) call function

```
htmlexport(dfk, 0, dfk.title.count())
```

(c) PB : imossible to add links because of some encoding pb

2. use xml.dom TEST

(a) use

```
from xml.dom import minidom
minidom.parseString(dfk.desc.iloc[10])
```

(b) PB : some descs are separated by comas

i. change spider

ii. use regexp to parse again

iii. test with proper html files : maybe it is just not working with html ?

```
from xml.dom import minidom
minidom.parseString("~/code/web/plasma-city/application/static/front.html'
```

3. use yattag

   (a) imports

```
from datetime import datetime
from os import mkdir
from yattag import Doc
```

   (b) html page generation

      i. functions definition

```
def linksgen(filename_base, pagenum, url):
    doc, tag, text = Doc().tagtext()

    with tag('a', href = "."):
        text('Home page ')
    with tag("a", href = filename_base + str(pagenum - 1) + ".html"):
        text("Previous page ")
    with tag("a", href = filename_base + str(pagenum + 1) + ".html"):
        text("Next page ")
    with tag("a", href = url):
        text("Original page ")
    return doc.getvalue()


def pagegen(filename_base, pagenum, title, desc, company, days, url):
    doc, tag, text = Doc().tagtext()

    doc.asis('<meta charset="UTF-8">')
    with tag("title"):
        text(title)
    with tag("body"):
        doc.asis(linksgen(filename_base, pagenum, url))
        with tag("h1"):
            text(title + " - " + company)
        with tag("p"):
            text(str(days))
        with tag("div"):
            doc.asis(desc)
        doc.asis(linksgen(filename_base, pagenum, url))

    return doc.getvalue()
```

ii. test pagegen TEST

```
pagegen("nom", 0, "titre", "desc", "firm", "days", "www")
```

```
'<meta charset="UTF-8"><title>titre</title><body><a href=".">Home page </a
```

iii. test linksgen TEST

```
linksgen("file", 10, "wwwww")
```

```
'<a href=".">Home page </a><a href="file9.html">Previous page </a><a href=
```

(c) htmlexport function

i. definition

```
def htmlexport(df, begin, end):
    date = str(datetime.now())
    path = "../reports/html/" + date + "/"
    mkdir(path)
    for i in range(begin, end):
        filename_base = "job-"
        html = pagegen(filename_base,
                       i,
                       df.title.iloc[i],
                       df.desc.iloc[i],
                       df.company.iloc[i],
                       df.days_ago.iloc[i],
                       df.url.iloc[i]
        )
        filename = path + filename_base +  str(i) + ".html"
        with open(filename, "a") as file:
            file.write(html)
```

ii. call

```
htmlexport(df, 0, len(df))
```

2.6.3 server

1. flask ? :D !!!

2.6.4 org table (python) PYTHON

1. john kitchin example TEST

```
import pandas as pd
test = pd.DataFrame({'A': [1000, 1000], 'B' : [60, 100]})
```

```
test2 = [list(test)] + [None] + test.values.tolist()
test3 = test.values.tolist()
return (test, test2, test3)
```

2. my program SLOW

```
import pandas as pd
df = pd.read_csv(data)
return  [list(df)] + [None] + df.values.tolist()
```

2.6.5 org results: html TEST

```
dfk.desc.iloc[0]
```

2.6.6 soupprint

1. session functions

   (a) souper (using get text)

   ```
   from bs4 import BeautifulSoup

   def souper(html):
       "returns only the text from a html string"
       soup = BeautifulSoup(html, 'html.parser')
       return soup.get_text()
   ```

   (b) soupprint

      i. definition

      ```
      from bs4 import BeautifulSoup

      def souper(html):
          soup = BeautifulSoup(html, 'html.parser')
          print(soup.get_text())

      def soupprint(df, begin, end):
          for i in range(begin, end):
              print(i, df.title.iloc[i])
              print("\n")
              print(df.company.iloc[i])
              print("\n")
              souper(df.desc.iloc[i])
      ```

```
            print("\n"*3)
            print("-"*100)
            print("\n"*3)
```

ii. call

```
soupprint(df, 0, 10)
```

2. soupprint as org function

(a) definition

```
from bs4 import BeautifulSoup

def souper(html):
    soup = BeautifulSoup(html, 'html.parser')
    print(soup.get_text())

def soupprint(df, begin, end):
    for i in range(begin, end):
        print(i, df.title.iloc[i])
        print("\n")
        print(df.company.iloc[i])
        print("\n")
        souper(df.desc.iloc[i])
        print("\n"*3)
        print("-"*100)
        print("\n"*3)
```

(b) call

```
soupprint(dfk, 0, dfk.title.count())
```

2.7 Queries

2.7.1 get queries metadata

1. dataframe using os results

```
import os
queries_name = []
queries_size = []
queries_path = []
queries_time = []
for dirpath, dirs, files in os.walk("../data/raw"):
```

```
  for filename in files:
    if filename.endswith('.csv'):

      path = os.path.join(dirpath, filename)
      queries_path.append(path)

      size = os.path.getsize(path)
      queries_size.append(size)

      fname = filename.replace(".csv", "")
      queries_name.append(fname)

      time = os.path.getmtime(path)
      queries_time.append(time)

queries = pd.DataFrame({"name" : queries_name, "path" : queries_path, "size" : que
```

2. remove oldests results

   (a) datetime time format

   ```
   queries["time"] = queries.time.apply(datetime.fromtimestamp)
   ```

   (b) y-m-d format time

   ```
   def format_time(x):
       y = x.strftime("%Y-%m-%d")
       return y

   queries["time_formated"] = queries.time.apply(format_time)
   ```

3. remove null size results

```
queries_null = queries[queries["size"] < 1]
queries = queries[queries["size"] > 1]
```

4. number of entries in csv file

   (a) read as pandas dataframe

   ```
   def entries_count(csv):
       return len(pd.read_csv(csv))

   queries["entries"] = queries.path.apply(entries_count)
   ```

5. inspection

```
import humanize
queries["size_for_humans"] = queries["size"].apply(humanize.naturalsize)
queries.sort_values("size", ascending=False)[["name", "size_for_humans", "entries"
```

index		name	size_for_humans	entries
0	134	data	3.5 MB	1363
1	133	python	3.4 MB	1291
2	121	intelligence	3.2 MB	1108
3	126	pyjobs	3.2 MB	1260
4	122	python-jobs-berlin-21-05-18	3.2 MB	1260
5	119	software engineer	2.7 MB	774
6	130	aws	2.7 MB	1247
7	127	marketing	2.4 MB	956
8	136	database	2.3 MB	630
9	124	finance	2.3 MB	849
10	114	analyst	2.2 MB	873
11	131	developer	2.2 MB	1077
12	112	business_analyst	1.7 MB	632
13	113	oracle	921.4 kB	417
14	129	internship	789.4 kB	356
15	83	e business	601.2 kB	160
16	70	intelligence	581.0 kB	148
17	94	sql	549.3 kB	158
18	40	business intelligence	546.2 kB	138
19	102	startup	540.5 kB	143
20	51	system	536.3 kB	161
21	178	python	517.0 kB	146
22	74	finance	501.8 kB	156
23	64	engineer	492.5 kB	130
24	110	frontend	487.3 kB	128
25	75	html	459.5 kB	149
26	103	data	449.2 kB	125
27	177	software engineer	442.6 kB	129
28	89	aws	439.1 kB	100
29	141	c	434.8 kB	148
..	...	...	...	...
117	120	junior_python	21.1 kB	98
118	111	live coding	19.6 kB	5

119	168	camera	18.9 kB	6
120	140	keras	17.5 kB	5
121	22	museum	17.2 kB	7
122	57	system admin	17.1 kB	5
123	88	beginner	17.0 kB	5
124	23	advertisement	16.2 kB	5
125	1	anfänger	12.1 kB	4
126	175	dsp	11.3 kB	3
127	62	growth hacker	11.1 kB	3
128	32	garden	10.9 kB	4
129	27	movie	10.6 kB	3
130	60	clojure	10.2 kB	3
131	38	kunst und medien	9.6 kB	4
132	65	français	7.2 kB	2
133	42	growth hacking	6.9 kB	2
134	16	buchhandel	6.3 kB	2
135	158	assembly language	6.0 kB	1
136	18	digital artist	5.7 kB	3
137	50	audio unit	4.7 kB	2
138	157	bsd	4.5 kB	1
139	67	lean analyst	4.4 kB	1
140	165	punk	3.4 kB	1
141	72	flask	3.1 kB	1
142	142	midi	3.0 kB	3
143	84	webapp	2.6 kB	1
144	41	fin tech	2.5 kB	1
145	143	d3.js	1.7 kB	1
146	17	flowers	900 Bytes	1

[147 rows x 4 columns]

6. time evolution

7. return list for next scraper launch remove null size results before (or not)

```
queries_list = list(set(queries.name))
```

```
['garten',
'junior_python',
```

```
'aws',
'vr',
'startup',
'sensors',
'buchhandel',
'python internship',
'ic',
'keras',
'numpy',
'live coding',
'telearbeit',
'lean analytics',
'data',
'github',
'blockchain',
'c++',
'frontend',
'd3.js',
'electronics',
'restaurant',
'growth hacking',
'bio',
'blumen',
'javascript',
'kunst und medien',
'modeling',
'system',
'ruby',
'lean analyst',
'dsp',
'midi',
'docker',
'webapp',
'beginner',
'database',
'bsd',
'pyjobs',
'garden',
'c',
'unix',
```

```
'français',
'photography',
'embedded system',
'css',
'html',
'linux',
'küche',
'punk',
'investment',
'pandas',
'fin tech',
'camera',
'junior',
'show',
'movie',
'oracle',
'küchenhilfe',
'sql',
'python-jobs-berlin-21-05-18',
'jenkins',
'remote',
'intelligence',
'e business',
'finance',
'praktikum',
'teilzeit',
'spa',
'cuisine',
'flowers',
'yoga',
'anfänger',
'fintech',
'seo',
'online marketing',
'venture capital',
'3d',
'audio unit',
'advertisement',
'computer art',
'assembly language',
```

```
'computer vision',
'museum',
'virtual reality',
'data scientist',
'data visualization',
'certification_analysis',
'sem',
'google trends',
'django',
'real-time',
'scraping',
'french',
'backend',
'python_internship',
'python praktikum',
'facebook ads',
'kunst',
'music',
'digital art',
'zuhause',
'tableau',
'engineer',
'java',
'git',
'part-time',
'marketing',
'business intelligence',
'system admin',
'software engineer',
'clojure',
'developer',
'python',
'mapping',
'digital artist',
'heroku',
'graphql',
'sound',
'analyst',
'art',
'internship',
```

```
    'architect',
    'flask',
    'growth hacker',
    'business_analyst',
    'rock']
```

2.7.2 launch scraper with the list

3 Documentation

3.1 doc : look for matching patern DOC

```
help(df.title.str.contains)

Help on method contains in module pandas.core.strings:

contains(pat, case=True, flags=0, na=nan, regex=True) method of pandas.core.strings.St
    Return boolean Series/‘‘array‘‘ whether given pattern/regex is
    contained in each string in the Series/Index.

    Parameters
    ----------
    pat : string
        Character sequence or regular expression
    case : boolean, default True
        If True, case sensitive
    flags : int, default 0 (no flags)
        re module flags, e.g. re.IGNORECASE
    na : default NaN, fill value for missing values.
    regex : bool, default True
        If True use re.search, otherwise use Python in operator

    Returns
    -------
    contained : Series/array of boolean values

    See Also
    --------
    match : analogous, but stricter, relying on re.match instead of re.search
```

3.2 pandas

Pandas cheat sheet

4 Tests

4.1 ob-ipython

4.1.1 hands-on tryout

1. hello world

   ```
   print 'hello world'
   ```

2. function definition

   ```
   def fn():
       print "I am in the session !"
   ```

3. function call

   ```
   fn()
   ```

4.1.2 doc tutorial

1. imports

   ```
   %matplotlib inline
   import matplotlib.pyplot as plt
   import numpy as np
   ```

2. ex2

   ```
   def foo(x):
       return x + 9

   [foo(x) + 7 for x in range(7)]
   ```

3. images

   (a) ex1

   ```
   plt.hist(np.random.randn(20000), bins=200)
   ```

(b) ex2

```
plt.hist(np.random.randn(20000), bins=200)
```

(c) config

```
%config InlineBackend.figure_format = 'svg'
```

4. other kernel

```
(+ 1 2)
```

5. async

```
import time
time.sleep(3)
plt.hist(np.random.randn(20000), bins=200)
```

4.1.3 other tryouts

1. functions

(a) call

```
lol()
```

2. formater

(a) init

```
import IPython
from tabulate import tabulate

class OrgFormatter(IPython.core.formatters.BaseFormatter):
    def __call__(self, obj):
        try:
            return tabulate(obj, headers='keys',
                            tablefmt='orgtbl', showindex='always')
        except:
            return None

ip = get_ipython()
ip.display_formatter.formatters['text/org'] = OrgFormatter()
```

(b) arrays

3. kernel tests

   (a) session header arg after run console

   ```
   print("hello")
   ```

   (b) kernel headerarg

   ```
   print("hello")
   ```

4.2 nltk

4.2.1 text selection

1. sample text base

   ```
   from nltk.book import *
   ```

2. access text as string

   (a) imports

   ```
   import nltk, re, pprint
   from nltk import word_tokenize
   ```

   (b) with one description

      i. definition

      ```
      string = df.iloc[0].desc
      ```

      ii. formating

         A. html

         ```
         string = souper(string)
         ```

         B. case

         ```
         string = string.lower()
         ```

         C. punctiations

         D. definition

         ```
         def multi_replace(string, *args, replace=" "):
             for target in args:
                 string = string.replace(target, replace)
             return string

         trash_car = (",", "\'", "\"", "&", "#", "{", "}",
                      "(", ")", "[", "]", "_", "\\", "~", "-",
         ```

```
",", ";", ":", ".", "?", "!", "+", "|",
"@", "/", "-", "*", "‘‘", ",,", "%", " ",
"€")
```

E. call

```
string = multi_replace(string, *trash_car)
```

(c) to ntlk text object

i. tokenizing

```
tokens = word_tokenize(string)
```

ii. use as nltk text

```
text = nltk.Text(tokens)
```

4.2.2 search

1. concordance

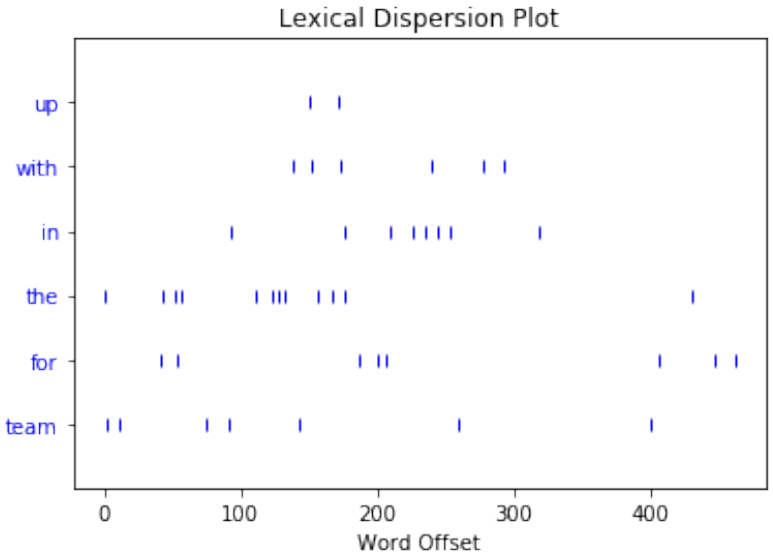
```
text.concordance("data")
```

2. similar word

```
text.similar("analyst")
```

3. dispersion

```
text.dispersion_plot(["up", "with", "in", "the", "for", "team"])
```



4.2.3 generation TEST

```
text.generate(["The", "job", "is", "for", "data", "team"])
```

4.2.4 normalizing

1. steaming
2. lemmatization

4.2.5 vocabulary

1. sorted set

```
sorted(set(text))
```

```
['17',
'2008',
'23',
'3',
'40',
'5',
'<',
'a',
```

```
'able',
'about',
'academic',
'across',
'active',
'adapt',
'additional',
'advertising',
'all',
'also',
'an',
'analysis',
'analysts',
'analytical',
'analytics',
'analyzing',
'and',
'anja',
'are',
'area',
'art',
'as',
'aspects',
'assistance',
'at',
'atmosphere',
'attitude',
'available',
'backgrounds',
'basis',
'behavior',
'beverages',
'bieten',
'brands',
'bringing',
'building',
'business',
'but',
'celebrate',
'centrally',
```

```
'challenges',
'change',
'changing',
'choose',
'closely',
'coaching',
'com',
'come',
'commerce',
'committed',
'communicating',
'comparable',
'competitive',
'computer',
'conflicts',
'connecting',
'context',
'contribute',
'crm',
'customer',
'customers',
'daily',
'data',
'databases',
'de',
'decided',
'decisions',
'deep',
'department',
'develop',
'developing',
'development',
'different',
'digital',
'direct',
'discount',
'discounts',
'diverse',
'diversity',
'drive',
```

```
'e',
'easily',
'economics',
'effectively',
'ein',
'einkaufserlebnis',
'employee',
'employment',
'empowerment',
'enable',
'entire',
'environment',
'equipment',
'equivalent',
'europas',
'europe',
'experience',
'expertise',
'experts',
'external',
'fashion',
'fast',
'feedback',
'field',
'flexible',
'focus',
'for',
'foundation',
'free',
'from',
'fruits',
'full',
'führende',
'g',
'getting',
'great',
'groups',
'have',
'head',
'health',
```

```
'help',
'holidays',
'https',
'ideally',
'impact',
'in',
'independently',
'information',
'innovations',
'insights',
'inspiring',
'intelligence',
'interests',
'internal',
'international',
'internationals',
'into',
'is',
'ist',
'it',
'its',
'junior',
'keep',
'knowledge',
'kunden',
'languages',
'lay',
'lead',
'leading',
'located',
'logistics',
'long',
'look',
'looking',
'lounge',
'mail',
'managing',
'many',
'markets',
'mathematics',
```

```
'means',
'members',
'mentoring',
'merit',
'methods',
'million',
'models',
'more',
'most',
'municipality',
'name',
'need',
'needed',
'new',
'not',
'of',
'off',
'offering',
'offerings',
'offices',
'on',
'online',
'only',
'opensource',
'opportunities',
'or',
'other',
'our',
'out',
'paced',
'partners',
'perks',
'personal',
'perspectives',
'platform',
'plattform',
'positive',
'potential',
'priorities',
'proactive',
```

```
'public',
'python',
'qualifications',
'questions',
'quick',
'r',
'radar',
're',
'recruiter',
'related',
'relevant',
'relocation',
'reports',
'represent',
'research',
'responsibility',
'run',
's',
'salary',
'science',
'segment',
'seit',
'senior',
'services',
'sets',
'share',
'shop',
'shopping',
'showcases',
'similar',
'size',
'skill',
'skills',
'solutions',
'solve',
'spierling',
'sports',
'sql',
'stakeholders',
'state',
```

```
'statistical',
'statistics',
'strategy',
'structures',
'subject',
'tailored',
'team',
'teams',
'tech',
'technical',
'term',
'than',
'that',
'the',
'their',
'them',
'things',
'thinking',
'through',
'time',
'times',
'to',
'toe',
'together',
'too',
'top',
'transforming',
'transport',
'trust',
'umfassendes',
'understanding',
'unseren',
'up',
'use',
'user',
'using',
'valuable',
'variety',
'volunteering',
'warehouse',
```

```
'ways',
'we',
'well',
'what',
'where',
'which',
'will',
'wir',
'with',
'work',
'working',
'workplace',
'x',
'years',
'you',
'your',
'zalando']
```

2. lexical richness

   (a) tryout

   ```
   len(text) / len(set(text))
   ```

   (b) function

   ```
   def lexical_diversity(text):
       return len(text) / len(set(text))

   1.6950819672131148
   ```

3. specific word

   (a) tryout

   ```
   100 * text.count('for') / len(text)

   1.5473887814313345
   ```

   (b) functyion

   ```
   def word_percentage(word):
       return 100 * text.count(word) / len(text)
   ```

4.2.6 TODO Build a corpus !

1. sklearn

```
docs = df['desc']

tfs = tfidf.fit_transform(docs)
```