```
In [72]: import pandas as pd
         import numpy as np

         df = pd.read_csv("ChocolateWeightMMT1a.txt", parse_dates = ['Reading'],
                          na_values=['-999'], delim_whitespace=True)
```

```
In [73]: df.head()
```

Out[73]:

	Reading	Grams	weight
0	2019:2:20	NaN	NaN
1	14:18:17	251.06	47.1
2	14:18:18	251.06	47.1
3	14:18:21	251.06	47.1
4	14:18:24	251.06	47.1

```
In [74]: df.columns = ['time','weight','grams']
         df.drop(df.index[0], inplace=True)
```

```
In [75]: df.head()
```

Out[75]:

	time	weight	grams
1	14:18:17	251.06	47.1
2	14:18:18	251.06	47.1
3	14:18:21	251.06	47.1
4	14:18:24	251.06	47.1
5	14:18:26	251.06	47.1

```
In [76]: df = df.reset_index(drop=True)
```

```
In [77]: df.head()
```

Out[77]:

	time	weight	grams
0	14:18:17	251.06	47.1
1	14:18:18	251.06	47.1
2	14:18:21	251.06	47.1
3	14:18:24	251.06	47.1
4	14:18:26	251.06	47.1

```
In [83]: df.time = pd.to_timedelta(df.time)
```

```
In [84]: type(df.time[2])
```

Out[84]: pandas._libs.tslibs.timedeltas.Timedelta

```
In [80]: len(df)
```

Out[80]: 166

```
In [81]: time_array=np.arange(166.)
```

```
In [82]: len(time_array)
```

Out[82]: 166

```
In [96]:  #df['time']=pd.to_datetime(df['time'])
          import datetime

          #tot=df.time[1]-df.time[0]
          #datetime.timedelta(tot).total_seconds()
          n=0
          for i in time_array:
              time_array[n]=datetime.timedelta.total_seconds(df.time[n]-df.time[0])
              n=n+1
```

```
In [97]:  time_array
```

```
Out[97]:  array([  0.,   1.,   4.,   7.,   9.,  12.,  15.,  17.,  20.,  23.,  25.,
                  28.,  31.,  33.,  36.,  51.,  52.,  54.,  57.,  60.,  67.,  68.,
                  70.,  77.,  78.,  78.,  81.,  83.,  86.,  89.,  92.,  94.,  97.,
                  99., 102., 105., 108., 110., 113., 115., 118., 121., 123., 126.,
                 129., 131., 134., 137., 139., 167., 168., 171., 174., 176., 179.,
                 182., 184., 187., 190., 192., 195., 197., 200., 203., 206., 208.,
                 211., 214., 216., 219., 221., 224., 227., 230., 232., 235., 237.,
                 240., 243., 245., 248., 251., 254., 257., 258., 261., 264., 267.,
                 269., 272., 275., 277., 280., 282., 285., 288., 290., 293., 296.,
                 299., 301., 304., 307., 309., 312., 314., 317., 320., 322., 325.,
                 328., 331., 333., 336., 338., 341., 343., 346., 349., 352., 355.,
                 357., 359., 362., 365., 367., 370., 373., 375., 378., 381., 383.,
                 386., 388., 391., 394., 397., 399., 402., 404., 407., 410., 412.,
                 415., 418., 420., 423., 426., 428., 431., 434., 436., 439., 442.,
                 444., 447., 449., 453., 455., 458., 460., 463., 467., 468., 471.,
                 476.])
```

```
In [98]:  datetime.timedelta.total_seconds(df.time[3]-df.time[0])
```

```
Out[98]:  7.0
```

```
In [106]: df = df.drop("time", axis=1)
```

```
In [108]: df.head()
```

Out[108]:

	weight	grams
0	251.06	47.1
1	251.06	47.1
2	251.06	47.1
3	251.06	47.1
4	251.06	47.1

```
In [152]: import pandas as pd
          time_array=pd.DataFrame(data=time_array)
```

```
In [ ]:   type(time_array)
```

```
In [111]: df_array=pd.concat([time_array,df],axis=1)
```

```
In [112]: df_array.head()
```

Out[112]:

	0	weight	grams
0	0.0	251.06	47.1
1	1.0	251.06	47.1
2	4.0	251.06	47.1
3	7.0	251.06	47.1
4	9.0	251.06	47.1

```
In [113]: df_array.columns = ['time','weight','grams']
```

```
In [114]:  df_array.head()
```

Out[114]:

	time	weight	grams
0	0.0	251.06	47.1
1	1.0	251.06	47.1
2	4.0	251.06	47.1
3	7.0	251.06	47.1
4	9.0	251.06	47.1

```python
In [143]:  import matplotlib.pyplot as plt

           from scipy import stats

           # create the plot space upon which to plot the data
           fig, ax = plt.subplots(figsize = (8,8))
           slope, intercept, r_value, p_value, std_err = stats.linregress(df_array.time,df_array['weig
           ht'])
           line = slope*df_array.time+intercept

           # add the x-axis and the y-axis to the plot
           ax.plot(df_array.time, df_array['weight'],'o', df_array.time, line)


           # rotate tick labels
           plt.setp(ax.get_xticklabels(), rotation=45)


           # set title and labels for axes
           ax.set(xlabel="Time[s]",
                  ylabel="Weight[g]",
                  title="ChocolateWeightMMT1a.txt");

           plt.savefig('filename.png', dpi=600)
```
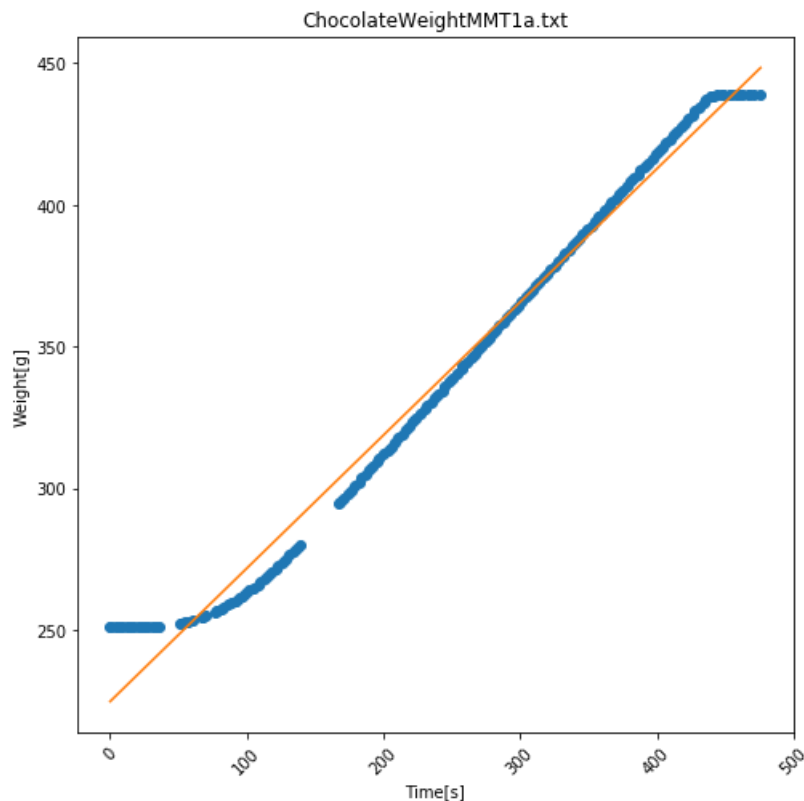


```
In [146]:  #######FINISHES HERE
```

```
In [ ]:  '''
         (base) Zulfidins-MacBook-Pro:~ zulfidinkhodzhaev$ conda list
         # packages in environment at /anaconda3:
         #
         # Name                    Version                   Build   Channel
         _ipyw_jlab_nb_ext_conf    0.1.0                     py37_0
         alabaster                 0.7.12                    py37_0
         anaconda                  2018.12                   py37_0
         anaconda-client           1.7.2                     py37_0
         anaconda-navigator        1.9.6                     py37_0
         anaconda-project          0.8.2                     py37_0
         appnope                   0.1.0                     py37_0
         appscript                 1.0.1                 py37h1de35cc_1
         asn1crypto                0.24.0                    py37_0
         astroid                   2.1.0                     py37_0
         astropy                   3.1                   py37h1de35cc_0
         atomicwrites              1.2.1                     py37_0
         attrs                     18.2.0                py37h28b3542_0
         automat                   0.7.0                     pypi_0    pypi
         babel                     2.6.0                     py37_0
         backcall                  0.1.0                     py37_0
         backports                 1.0                       py37_1
         backports.os              0.1.1                     py37_0
         backports.shutil_get_terminal_size 1.0.0                    py37_2
         beautifulsoup4            4.6.3                     py37_0
         bitarray                  0.8.3                 py37h1de35cc_0
         bkcharts                  0.2                       py37_0
         blas                      1.0                         mkl
         blaze                     0.11.3                    py37_0
         bleach                    3.0.2                     py37_0
         blosc                     1.14.4                    hd9629dc_0
         bokeh                     1.0.2                     py37_0
         boto                      2.49.0                    py37_0
         boto3                     1.9.118                   pypi_0    pypi
         botocore                  1.12.118                  pypi_0    pypi
         bottleneck                1.2.1                 py37h1d22016_1
         bzip2                     1.0.6                     h1de35cc_5
         ca-certificates           2018.03.07                   0
         certifi                   2018.11.29                py37_0
         cffi                      1.11.5                py37h6174b99_1
         chardet                   3.0.4                     py37_1
         click                     7.0                       py37_0
         cloudpickle               0.6.1                     py37_0
         clyent                    1.2.2                     py37_1
         colorama                  0.4.1                     py37_0
         coloredlogs               10.0                      pypi_0    pypi
         conda                     4.6.8                     py37_0
         conda-build               3.17.6                    py37_0
         conda-env                 2.6.0                        1
         conda-verify              3.1.1                     py37_0
         constantly                15.1.0                    pypi_0    pypi
         contextlib2               0.5.5                     py37_0
         cryptography              2.4.2                 py37ha12b0ac_0
         curl                      7.63.0                ha441bb4_1000
         cycler                    0.10.0                    py37_0
         cymem                     2.0.2                     pypi_0    pypi
         cython                    0.29.2                py37h0a44026_0
         cytoolz                   0.9.0.1               py37h1de35cc_1
         dask                      1.0.0                     py37_0
         dask-core                 1.0.0                     py37_0
         datashape                 0.5.4                     py37_1
         dbus                      1.13.2                    h760590f_1
         decorator                 4.3.0                     py37_0
         defusedxml                0.5.0                     py37_1
         dill                      0.2.9                     pypi_0    pypi
         distributed               1.25.1                    py37_0
         docutils                  0.14                      py37_0
         en-core-web-md            2.0.0                     pypi_0    pypi
         entrypoints               0.2.3                     py37_2
         et_xmlfile                1.0.1                     py37_0
         expat                     2.2.6                     h0a44026_0
         fastcache                 1.0.2                 py37h1de35cc_2
         filelock                  3.0.10                    py37_0
         flask                     1.0.2                     py37_1
         flask-cors                3.0.7                     py37_0
         freetype                  2.9.1                     hb4e5f40_0
```

```
future                  0.17.1              py37_0
get_terminal_size       1.0.0               h7520d66_0
gettext                 0.19.8.1            h15daf44_3
gevent                  1.3.7               py37h1de35cc_1
glib                    2.56.2              hd9629dc_0
glob2                   0.6                 py37_1
gmp                     6.1.2               hb37e062_1
gmpy2                   2.0.8               py37h6ef4df4_2
greenlet                0.4.15              py37h1de35cc_0
h5py                    2.8.0               py37h878fce3_3
hdf5                    1.10.2              hfa1e0ec_1
heapdict                1.0.0               py37_2
html5lib                1.0.1               py37_0
humanfriendly           4.18                pypi_0          pypi
hyperlink               18.0.0              pypi_0          pypi
icu                     58.2                h4b95b61_1
idna                    2.8                 py37_0
imageio                 2.4.1               py37_0
imagesize               1.1.0               py37_0
importlib_metadata      0.6                 py37_0
incremental             17.5.0              pypi_0          pypi
intel-openmp            2019.1              144
ipykernel               5.1.0               py37h39e3cac_0
ipython                 7.2.0               py37h39e3cac_0
ipython_genutils        0.2.0               py37_0
ipywidgets              7.4.2               py37_0
isort                   4.3.4               py37_0
itsdangerous            1.1.0               py37_0
jbig                    2.1                 h4d881f8_0
jdcal                   1.4                 py37_0
jedi                    0.13.2              py37_0
jinja2                  2.10                py37_0
jmespath                0.9.4               pypi_0          pypi
jpeg                    9b                  he5867d9_2
jsonschema              2.6.0               py37_0
jupyter                 1.0.0               py37_7
jupyter_client          5.2.4               py37_0
jupyter_console         6.0.0               py37_0
jupyter_core            4.4.0               py37_0
jupyterlab              0.35.3              py37_0
jupyterlab_server       0.2.0               py37_0
keyring                 17.0.0              py37_0
kiwisolver              1.0.1               py37h0a44026_0
klein                   17.10.0             pypi_0          pypi
krb5                    1.16.1              hddcf347_7
lazy-object-proxy       1.3.1               py37h1de35cc_2
libarchive              3.3.3               h786848e_5
libcurl                 7.63.0              h051b688_1000
libcxx                  4.0.1               hcfea43d_1
libcxxabi               4.0.1               hcfea43d_1
libedit                 3.1.20170329        hb402a30_2
libffi                  3.2.1               h475c297_4
libgfortran             3.0.1               h93005f0_2
libiconv                1.15                hdd342a3_7
liblief                 0.9.0               h2a1bed3_0
libpng                  1.6.35              ha441bb4_0
libsodium               1.0.16              h3efe00b_0
libssh2                 1.8.0               ha12b0ac_4
libtiff                 4.0.9               hcb84e12_2
libxml2                 2.9.8               hab757c2_1
libxslt                 1.1.32              hb819dd2_0
llvmlite                0.26.0              py37h8c7ce04_0
locket                  0.2.0               py37_1
lxml                    4.2.5               py37hef8c89e_0
lz4-c                   1.8.1.2             h1de35cc_0
lzo                     2.10                h362108e_2
markupsafe              1.1.0               py37h1de35cc_0
matplotlib              2.2.4               pypi_0          pypi
mccabe                  0.6.1               py37_1
mistune                 0.8.4               py37h1de35cc_0
mkl                     2019.1              144
mkl-service             1.1.2               py37hfbe908c_5
mkl_fft                 1.0.6               py37h27c97d8_0
mkl_random              1.0.2               py37h27c97d8_0
more-itertools          4.3.0               py37_0
mpc                     1.1.0               h6ef4df4_1
mpfr                    4.0.1               h3018a27_3
```

```
mpmath                    1.1.0              py37_0
msgpack-numpy             0.4.3.2            pypi_0      pypi
msgpack-python            0.5.6              py37h04f5b5a_1
multipledispatch          0.6.0              py37_0
murmurhash                1.0.2              pypi_0      pypi
navigator-updater         0.2.1              py37_0
nbconvert                 5.4.0              py37_1
nbformat                  4.4.0              py37_0
ncurses                   6.1                h0a44026_1
networkx                  2.2                py37_1
nltk                      3.4                py37_1
nose                      1.3.7              py37_2
notebook                  5.7.4              py37_0
numba                     0.41.0             py37h6440ff4_0
numexpr                   2.6.8              py37h7413580_0
numpy                     1.15.4             py37hacdab7b_0
numpy-base                1.15.4             py37h6575580_0
numpydoc                  0.8.0              py37_0
odo                       0.5.1              py37_0
olefile                   0.46               py37_0
openpyxl                  2.5.12             py37_0
openssl                   1.1.1a             h1de35cc_0
packaging                 18.0               py37_0
pandas                    0.23.4             py37h6440ff4_0
pandoc                    1.19.2.1           ha5e8f32_1
pandocfilters             1.4.2              py37_1
parso                     0.3.1              py37_0
partd                     0.3.9              py37_0
path.py                   11.5.0             py37_0
pathlib2                  2.3.3              py37_0
patsy                     0.5.1              py37_0
pcre                      8.42               h378b8a2_0
pep8                      1.7.1              py37_0
pexpect                   4.6.0              py37_0
pickleshare               0.7.5              py37_0
pillow                    5.3.0              py37hb68e598_0
pip                       18.1               py37_0
pkginfo                   1.4.2              py37_1
plac                      0.9.6              pypi_0      pypi
pluggy                    0.8.0              py37_0
ply                       3.11               py37_0
preshed                   2.0.1              pypi_0      pypi
prometheus_client         0.5.0              py37_0
prompt_toolkit            2.0.7              py37_0
psutil                    5.4.8              py37h1de35cc_0
ptyprocess                0.6.0              py37_0
py                        1.7.0              py37_0
py-lief                   0.9.0              py37hd4eaf27_0
pycodestyle               2.4.0              py37_0
pycosat                   0.6.3              py37h1de35cc_0
pycparser                 2.19               py37_0
pycrypto                  2.6.1              py37h1de35cc_9
pycurl                    7.43.0.2           py37ha12b0ac_0
pyflakes                  2.0.0              py37_0
pygments                  2.3.1              py37_0
pyhamcrest                1.9.0              pypi_0      pypi
pylint                    2.2.2              py37_0
pyodbc                    4.0.25             py37h0a44026_0
pyopenssl                 18.0.0             py37_0
pyparsing                 2.3.0              py37_0
pyqt                      5.9.2              py37h655552a_2
pysocks                   1.6.8              py37_0
pytables                  3.4.4              py37h13cba08_0
pytest                    4.0.2              py37_0
pytest-arraydiff          0.3                py37h39e3cac_0
pytest-astropy            0.5.0              py37_0
pytest-doctestplus        0.2.0              py37_0
pytest-openfiles          0.3.1              py37_0
pytest-remotedata         0.3.1              py37_0
python                    3.7.1              haf84260_7
python-crfsuite           0.9.6              pypi_0      pypi
python-dateutil           2.7.5              py37_0
python-libarchive-c       2.8                py37_6
python.app                2                  py37_9
pytz                      2018.7             py37_0
pywavelets                1.0.1              py37h1d22016_0
pyyaml                    3.13               py37h1de35cc_0
```

```
pyzmq                       17.1.2              py37h1de35cc_0
qt                          5.9.7                   h468cd18_1
qtawesome                   0.5.3                      py37_0
qtconsole                   4.4.3                      py37_0
qtpy                        1.5.2                      py37_0
rasa-nlu                    0.14.6                    pypi_0      pypi
readline                    7.0                    h1de35cc_5
regex                       2018.1.10                 pypi_0      pypi
requests                    2.21.0                     py37_0
rope                        0.11.0                     py37_0
ruamel-yaml                 0.15.89                   pypi_0      pypi
ruamel_yaml                 0.15.46             py37h1de35cc_0
s3transfer                  0.2.0                     pypi_0      pypi
scikit-image                0.14.1              py37h0a44026_0
scikit-learn                0.20.3                    pypi_0      pypi
scipy                       1.1.0               py37h1410ff5_2
seaborn                     0.9.0                      py37_0
send2trash                  1.5.0                      py37_0
setuptools                  40.6.3                     py37_0
simplegeneric               0.8.1                      py37_2
simplejson                  3.16.0                    pypi_0      pypi
singledispatch              3.4.0.3                    py37_0
sip                         4.19.8              py37h0a44026_0
six                         1.12.0                     py37_0
sklearn-crfsuite            0.3.6                     pypi_0      pypi
snappy                      1.1.7                   he62c110_3
snowballstemmer             1.2.1                      py37_0
sortedcollections           1.0.1                      py37_0
sortedcontainers            2.1.0                      py37_0
spacy                       2.0.18                    pypi_0      pypi
sphinx                      1.8.2                      py37_0
sphinxcontrib               1.0                        py37_1
sphinxcontrib-websupport    1.1.0                      py37_1
spyder                      3.3.2                      py37_0
spyder-kernels              0.3.0                      py37_0
sqlalchemy                  1.2.15              py37h1de35cc_0
sqlite                      3.26.0                  ha441bb4_0
statsmodels                 0.9.0               py37h1d22016_0
sympy                       1.3                        py37_0
tabulate                    0.8.3                     pypi_0      pypi
tblib                       1.3.2                      py37_0
terminado                   0.8.1                      py37_1
testpath                    0.4.2                      py37_0
thinc                       6.12.1                    pypi_0      pypi
tk                          8.6.8                   ha441bb4_0
toolz                       0.9.0                      py37_0
tornado                     5.1.1               py37h1de35cc_0
tqdm                        4.28.1              py37h28b3542_0
traitlets                   4.3.2                      py37_0
twisted                     18.9.0                    pypi_0      pypi
typing                      3.6.6                     pypi_0      pypi
ujson                       1.35                      pypi_0      pypi
unicodecsv                  0.14.1                     py37_0
unixodbc                    2.3.7                  h1de35cc_0
urllib3                     1.24.1                     py37_0
wcwidth                     0.1.7                      py37_0
webencodings                0.5.1                      py37_1
werkzeug                    0.14.1                     py37_0
wheel                       0.32.3                     py37_0
widgetsnbextension          3.4.2                      py37_0
wrapt                       1.10.11             py37h1de35cc_2
wurlitzer                   1.0.2                      py37_0
xlrd                        1.2.0                      py37_0
xlsxwriter                  1.1.2                      py37_0
xlwings                     0.15.1                     py37_0
xlwt                        1.3.0                      py37_0
xz                          5.2.4                  h1de35cc_4
yaml                        0.1.7                   hc338f04_2
zeromq                      4.2.5                   h0a44026_1
zict                        0.1.3                      py37_0
zlib                        1.2.11                 h1de35cc_3
zope-interface              4.6.0                     pypi_0      pypi
zstd                        1.3.7                   h5bba6e5_0
(base) Zulfidins-MacBook-Pro:~ zulfidinkhodzhaev$


'''
```

In [ ]: