MW1 _WEEK_Xarxa_walkForward_multivariate2-tempmin

December 21, 2019

1 Xarxa neuronal

```
In [1]: import pandas as pd
        import numpy as np
        from pandas import datetime
        from matplotlib import pyplot as plt

        import keras
        from keras.models import Sequential
        from keras.layers import Dense
        from keras.layers import LSTM

        from keras.optimizers import SGD
        from sklearn.model_selection import StratifiedKFold
        from scipy.stats import uniform as sp_rand
        from scipy.stats import randint
        from time import time
        from sklearn import preprocessing

        import math
        from sklearn.metrics import mean_squared_error
```

```
Using TensorFlow backend.
```

1.1 Consum setmanal total multivariate one-step

```
In [45]: daily=pd.read_csv('C:/Users/Laura/Desktop/Smart meters London/workspace R/Dades netes/
         daily.head(5)
```

```
Out[45]:          date  apparentTemperatureMax  apparentTemperatureMin  sunsetTimeHour  \
         0  2014-02-08                    5.67                    2.19              17
         1  2013-12-24                   11.93                    2.68              15
         2  2012-11-01                   11.46                    0.85              16
         3  2014-02-05                    5.86                    1.03              16
         4  2012-04-17                   10.01                    2.76              19
```

```
   weekday  season  cloudCover  humidity  visibility  month  dewPoint  \
0        6  winter        0.47      0.77       11.20      2      3.99
1        2  winter        0.40      0.81       10.86     12      5.42
2        4  autumn        0.44      0.85       12.54     11      5.06
3        3  winter        0.73      0.77       10.91      2      4.06
4        2  spring        0.60      0.87       11.86      4      5.74

   pressure  energy_sum
0    979.25   11.569300
1    979.52   11.981672
2    979.63   10.781689
3    982.20   11.415105
4    982.22   10.617443
```

In [46]:
```
#Ens quedem amb date i energy_sum, ordenem valors per data i resetejem index
daily_dia=daily[['date','energy_sum','apparentTemperatureMax','apparentTemperatureMin
daily_dia=daily_dia[['date','energy_sum','apparentTemperatureMax','apparentTemperatur
daily_dia.head(20)
```

Out[46]:

	date	energy_sum	apparentTemperatureMax	apparentTemperatureMin	humidity
0	2011-11-23	6.952692	10.36	2.18	0.93
1	2011-11-24	8.536480	12.93	7.01	0.89
2	2011-11-25	9.499781	13.03	4.84	0.79
3	2011-11-26	10.267707	12.96	4.69	0.81
4	2011-11-27	10.850805	13.54	2.94	0.72
5	2011-11-28	9.103382	12.58	1.31	0.86
6	2011-11-29	9.274873	13.47	3.39	
7	2011-11-30	8.813513	11.87	3.34	
8	2011-12-01	9.227707	12.15	5.29	
9	2011-12-02	10.145910	5.33	0.46	
10	2011-12-03	10.780273	11.42	4.71	
11	2011-12-04	12.163127	6.66	1.03	
12	2011-12-05	10.609714	3.13	-1.69	
13	2011-12-06	11.673417	3.77	-1.61	
14	2011-12-07	10.889362	5.14	0.94	
15	2011-12-08	11.525150	12.89	0.63	
16	2011-12-09	11.759837	3.99	-1.42	
17	2011-12-10	12.633801	3.14	-3.42	
18	2011-12-11	13.749174	5.72	0.11	
19	2011-12-12	11.951958	5.94	-0.64	

```
6       0.82
7       0.78
8       0.82
9       0.87
10      0.79
11      0.82
12      0.77
13      0.83
14      0.68
15      0.81
16      0.71
17      0.81
18      0.88
19      0.84
```

```
In [47]: #Passem data a datetime
         daily_dia["date"] = pd.to_datetime(daily["date"], format='%Y-%m-%d')
```

```
In [48]: import datetime
         daily_dia['week']=0
         daily_dia['year']=0
         for i in range(len(daily_dia)):

             daily_dia['week'][i]= daily_dia['date'][i].strftime('%W')
             daily_dia['year'][i]= daily_dia['date'][i].strftime('%Y')
         daily_dia
```

```
c:\users\laura\appdata\local\programs\python\python37\lib\site-packages\ipykernel_launcher.py:6
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stable/indexing.html

c:\users\laura\appdata\local\programs\python\python37\lib\site-packages\ipykernel_launcher.py:7
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stable/indexing.html
  import sys
```

Out[48]:

	date	energy_sum	apparentTemperatureMax	apparentTemperatureMin	\
0	2014-02-08	6.952692	10.36	2.18	
1	2013-12-24	8.536480	12.93	7.01	
2	2012-11-01	9.499781	13.03	4.84	
3	2014-02-05	10.267707	12.96	4.69	
4	2012-04-17	10.850805	13.54	2.94	
5	2012-04-18	9.103382	12.58	1.31	
6	2013-12-25	9.274873	13.47	3.39	
7	2014-02-09	8.813513	11.87	3.34	
8	2014-01-28	9.227707	12.15	5.29	

9	2012-12-14	10.145910	5.33	0.46
10	2013-12-27	10.780273	11.42	4.71
11	2011-12-16	12.163127	6.66	1.03
12	2012-04-24	10.609714	3.13	-1.69
13	2014-02-15	11.673417	3.77	-1.61
14	2014-02-07	10.889362	5.14	0.94
15	2012-09-24	11.525150	12.89	0.63
16	2012-09-23	11.759837	3.99	-1.42
17	2014-01-27	12.633801	3.14	-3.42
18	2014-02-06	13.749174	5.72	0.11
19	2012-10-31	11.951958	5.94	-0.64
20	2012-04-09	11.957446	12.08	0.22
21	2014-02-01	12.392776	2.88	0.78
22	2011-12-13	12.307079	4.38	1.07
23	2014-02-14	13.376080	0.99	-2.65
24	2013-03-17	13.511968	1.72	-3.56
25	2014-01-16	14.732271	1.98	-4.12
26	2014-01-17	13.774471	4.02	-3.67
27	2013-03-18	12.709106	4.98	1.68
28	2012-11-02	12.148570	12.14	3.84
29	2012-12-15	11.839403	12.14	5.37
..	...	...	...	...
800	2011-12-26	11.800777	2.53	0.18
801	2012-01-10	11.685169	5.86	0.61
802	2012-03-25	11.857957	5.27	0.29
803	2013-12-02	11.710582	6.86	1.10
804	2013-11-27	12.078164	6.48	3.21
805	2012-03-21	11.280011	4.59	1.96
806	2013-02-27	11.095584	5.63	1.12
807	2012-02-12	11.415105	5.86	1.03
808	2012-03-13	11.445403	7.34	1.96
809	2013-11-28	10.972318	8.44	-0.86
810	2012-03-09	11.569300	5.67	2.19
811	2012-03-20	12.202967	3.91	1.38
812	2012-03-12	11.264175	7.07	0.89
813	2013-01-05	11.452649	4.06	-0.57
814	2012-02-02	11.679099	4.73	-1.20
815	2012-02-04	11.285737	3.42	0.05
816	2012-03-25	11.816914	12.02	0.45
817	2012-03-26	11.490470	5.79	1.77
818	2012-03-10	11.582159	7.88	-1.03
819	2012-05-11	10.979566	10.67	2.84
820	2012-02-11	10.781898	10.13	3.83
821	2012-03-11	10.674624	10.13	2.65
822	2013-01-04	10.573835	12.50	3.95
823	2013-11-25	10.518126	10.15	0.19
824	2012-02-10	10.776242	11.63	1.59
825	2013-11-26	11.480411	11.94	5.53

826	2012-02-03	10.411403	14.23	5.52
827	2012-02-09	10.294997	11.43	3.89
828	2012-02-07	10.202945	11.29	1.67
829	2012-02-08	10.356350	10.31	1.41

	humidity	week	year
0	0.93	5	2014
1	0.89	51	2013
2	0.79	44	2012
3	0.81	5	2014
4	0.72	16	2012
5	0.86	16	2012
6	0.82	51	2013
7	0.78	5	2014
8	0.82	4	2014
9	0.87	50	2012
10	0.79	51	2013
11	0.82	50	2011
12	0.77	17	2012
13	0.83	6	2014
14	0.68	5	2014
15	0.81	39	2012
16	0.71	38	2012
17	0.81	4	2014
18	0.88	5	2014
19	0.84	44	2012
20	0.75	15	2012
21	0.79	4	2014
22	0.77	50	2011
23	0.88	6	2014
24	0.86	10	2013
25	0.84	2	2014
26	0.94	2	2014
27	0.81	11	2013
28	0.94	44	2012
29	0.87	50	2012
..	...	...	...
800	0.90	52	2011
801	0.91	2	2012
802	0.91	12	2012
803	0.76	48	2013
804	0.72	47	2013
805	0.79	12	2012
806	0.75	8	2013
807	0.77	6	2012
808	0.82	11	2012
809	0.79	47	2013
810	0.77	10	2012

```
811      0.66    12  2012
812      0.84    11  2012
813      0.76     0  2013
814      0.75     5  2012
815      0.68     5  2012
816      0.81    12  2012
817      0.69    13  2012
818      0.76    10  2012
819      0.83    19  2012
820      0.87     6  2012
821      0.87    10  2012
822      0.84     0  2013
823      0.72    47  2013
824      0.71     6  2012
825      0.76    47  2013
826      0.74     5  2012
827      0.78     6  2012
828      0.73     6  2012
829      0.74     6  2012

[830 rows x 7 columns]
```

```
In [21]: daily_dia.energy_sum[5]+daily_dia.energy_sum[6]+daily_dia.energy_sum[7]+daily_dia.ener
```

```
Out[21]: 69.50878453206002
```

```
In [111]: daily_week= daily_dia.groupby(by=['year','week']).sum()
```

```
In [89]: daily_week
```

```
Out[89]:            energy_sum  apparentTemperatureMax  apparentTemperatureMin  \
         year week
         2011 47     51.114714                   70.67                   41.73
              48     65.571115                  111.13                   63.16
              49     63.016513                  117.25                   57.62
              50     82.034950                   68.42                   26.70
              51     75.672988                   77.77                   23.58
              52     59.108348                   78.15                   42.57
         2012 0      10.675958                    7.28                    4.53
              1      69.481120                  104.06                   53.30
              2      81.510830                   65.40                   14.72
              3      69.813180                   97.48                   41.30
              4      70.707853                   84.95                   38.71
              5      76.962281                   61.81                   24.32
              6      75.172341                   66.99                   15.38
              7      69.506432                  109.90                   56.36
              8      73.889743                   90.33                   35.41
              9      69.289775                   88.84                   34.64
              10     73.896709                   95.91                   38.71
```

	11	74.495490	81.83	28.21
	12	93.630022	53.57	5.47
	13	67.918920	112.48	57.91
	14	77.113029	77.07	23.69
	15	71.793072	106.22	51.59
	16	80.333027	65.84	8.96
	17	77.781531	69.61	28.21
	18	71.854679	90.02	55.94
	19	65.779445	104.08	55.79
	20	67.507820	101.91	51.37
	21	63.278685	123.67	69.41
	22	71.630877	65.12	25.98
	23	81.842540	70.05	17.85
...		...	...	...
2013	32	65.696722	121.75	66.28
	33	71.339482	93.73	40.54
	34	65.437931	104.52	61.85
	35	69.160818	102.64	53.02
	36	65.619442	121.08	55.72
	37	69.474258	112.72	65.23
	38	72.644275	79.24	48.42
	39	61.162204	138.10	73.43
	40	61.307206	118.27	68.44
	41	68.287755	105.45	48.73
	42	86.817619	38.43	-4.35
	43	74.077658	108.12	46.54
	44	78.895956	73.66	27.47
	45	71.739465	88.71	38.36
	46	72.005948	88.04	40.53
	47	80.713782	61.95	22.52
	48	76.877442	68.29	14.59
	49	69.451989	110.00	50.26
	50	70.245566	108.00	63.73
	51	82.914623	50.61	11.13
	52	18.612574	29.51	10.63
2014	0	62.324195	60.50	33.09
	1	75.867974	85.48	26.51
	2	90.607556	49.60	-3.94
	3	71.472853	96.40	52.84
	4	84.648671	50.44	6.50
	5	75.038481	70.13	11.97
	6	81.339806	72.08	23.30
	7	65.270613	131.84	75.08
	8	42.866392	52.60	20.80

		humidity
year	week	
2011	47	3.840000

```
      48    5.330000
      49    5.040000
      50    5.490000
      51    5.670000
      52    4.620000
2012  0     0.860000
      1     5.510000
      2     5.900000
      3     5.580000
      4     5.330000
      5     5.490000
      6     5.430000
      7     5.720000
      8     5.730000
      9     5.560000
      10    5.460000
      11    5.800000
      12    6.580000
      13    5.160000
      14    5.250000
      15    5.490000
      16    5.440000
      17    5.570000
      18    5.930000
      19    5.410000
      20    5.410000
      21    5.510000
      22    5.630000
      23    5.450000
...             ...
2013  32    5.610000
      33    5.130000
      34    5.430000
      35    5.280000
      36    4.930000
      37    5.340000
      38    5.870000
      39    4.872917
      40    5.160000
      41    5.720000
      42    5.660000
      43    5.110000
      44    5.400000
      45    5.610000
      46    5.360000
      47    5.520000
      48    5.430000
      49    5.260000
```

```
          50    5.330000
          51    5.910000
          52    1.470000
     2014 0     4.220000
          1     5.630000
          2     5.780000
          3     5.740000
          4     5.660000
          5     5.410000
          6     5.570000
          7     4.980000
          8     3.380000

     [122 rows x 4 columns]
```

In [112]:
```
#Passem de mitjana per llar de consum diari a mitjana per llar de consum setmanal

daily_week['apparentTemperatureMax']=daily_week['apparentTemperatureMax']/7
daily_week['humidity']=daily_week['humidity']/7
daily_week['apparentTemperatureMin']=daily_week['apparentTemperatureMin']/7
daily_week
```

Out[112]:

year	week	energy_sum	apparentTemperatureMax	apparentTemperatureMin
2011	47	51.114714	10.095714	5.961429
	48	65.571115	15.875714	9.022857
	49	63.016513	16.750000	8.231429
	50	82.034950	9.774286	3.814286
	51	75.672988	11.110000	3.368571
	52	59.108348	11.164286	6.081429
2012	0	10.675958	1.040000	0.647143
	1	69.481120	14.865714	7.614286
	2	81.510830	9.342857	2.102857
	3	69.813180	13.925714	5.900000
	4	70.707853	12.135714	5.530000
	5	76.962281	8.830000	3.474286
	6	75.172341	9.570000	2.197143
	7	69.506432	15.700000	8.051429
	8	73.889743	12.904286	5.058571
	9	69.289775	12.691429	4.948571
	10	73.896709	13.701429	5.530000
	11	74.495490	11.690000	4.030000
	12	93.630022	7.652857	0.781429
	13	67.918920	16.068571	8.272857
	14	77.113029	11.010000	3.384286
	15	71.793072	15.174286	7.370000
	16	80.333027	9.405714	1.280000
	17	77.781531	9.944286	4.030000

	18	71.854679	12.860000	7.991429
	19	65.779445	14.868571	7.970000
	20	67.507820	14.558571	7.338571
	21	63.278685	17.667143	9.915714
	22	71.630877	9.302857	3.711429
	23	81.842540	10.007143	2.550000
...		...	...	...
2013	32	65.696722	17.392857	9.468571
	33	71.339482	13.390000	5.791429
	34	65.437931	14.931429	8.835714
	35	69.160818	14.662857	7.574286
	36	65.619442	17.297143	7.960000
	37	69.474258	16.102857	9.318571
	38	72.644275	11.320000	6.917143
	39	61.162204	19.728571	10.490000
	40	61.307206	16.895714	9.777143
	41	68.287755	15.064286	6.961429
	42	86.817619	5.490000	-0.621429
	43	74.077658	15.445714	6.648571
	44	78.895956	10.522857	3.924286
	45	71.739465	12.672857	5.480000
	46	72.005948	12.577143	5.790000
	47	80.713782	8.850000	3.217143
	48	76.877442	9.755714	2.084286
	49	69.451989	15.714286	7.180000
	50	70.245566	15.428571	9.104286
	51	82.914623	7.230000	1.590000
	52	18.612574	4.215714	1.518571
2014	0	62.324195	8.642857	4.727143
	1	75.867974	12.211429	3.787143
	2	90.607556	7.085714	-0.562857
	3	71.472853	13.771429	7.548571
	4	84.648671	7.205714	0.928571
	5	75.038481	10.018571	1.710000
	6	81.339806	10.297143	3.328571
	7	65.270613	18.834286	10.725714
	8	42.866392	7.514286	2.971429

		humidity
year	week	
2011	47	0.548571
	48	0.761429
	49	0.720000
	50	0.784286
	51	0.810000
	52	0.660000
2012	0	0.122857
	1	0.787143

```
          2     0.842857
          3     0.797143
          4     0.761429
          5     0.784286
          6     0.775714
          7     0.817143
          8     0.818571
          9     0.794286
          10    0.780000
          11    0.828571
          12    0.940000
          13    0.737143
          14    0.750000
          15    0.784286
          16    0.777143
          17    0.795714
          18    0.847143
          19    0.772857
          20    0.772857
          21    0.787143
          22    0.804286
          23    0.778571
...                  ...
2013      32    0.801429
          33    0.732857
          34    0.775714
          35    0.754286
          36    0.704286
          37    0.762857
          38    0.838571
          39    0.696131
          40    0.737143
          41    0.817143
          42    0.808571
          43    0.730000
          44    0.771429
          45    0.801429
          46    0.765714
          47    0.788571
          48    0.775714
          49    0.751429
          50    0.761429
          51    0.844286
          52    0.210000
2014      0     0.602857
          1     0.804286
          2     0.825714
          3     0.820000
```

```
4     0.808571
5     0.772857
6     0.795714
7     0.711429
8     0.482857

[122 rows x 4 columns]
```

In [113]:
```
daily_week=daily_week.reset_index()
daily_week
```

Out[113]:

	year	week	energy_sum	apparentTemperatureMax	apparentTemperatureMin	\
0	2011	47	51.114714	10.095714	5.961429	
1	2011	48	65.571115	15.875714	9.022857	
2	2011	49	63.016513	16.750000	8.231429	
3	2011	50	82.034950	9.774286	3.814286	
4	2011	51	75.672988	11.110000	3.368571	
5	2011	52	59.108348	11.164286	6.081429	
6	2012	0	10.675958	1.040000	0.647143	
7	2012	1	69.481120	14.865714	7.614286	
8	2012	2	81.510830	9.342857	2.102857	
9	2012	3	69.813180	13.925714	5.900000	
10	2012	4	70.707853	12.135714	5.530000	
11	2012	5	76.962281	8.830000	3.474286	
12	2012	6	75.172341	9.570000	2.197143	
13	2012	7	69.506432	15.700000	8.051429	
14	2012	8	73.889743	12.904286	5.058571	
15	2012	9	69.289775	12.691429	4.948571	
16	2012	10	73.896709	13.701429	5.530000	
17	2012	11	74.495490	11.690000	4.030000	
18	2012	12	93.630022	7.652857	0.781429	
19	2012	13	67.918920	16.068571	8.272857	
20	2012	14	77.113029	11.010000	3.384286	
21	2012	15	71.793072	15.174286	7.370000	
22	2012	16	80.333027	9.405714	1.280000	
23	2012	17	77.781531	9.944286	4.030000	
24	2012	18	71.854679	12.860000	7.991429	
25	2012	19	65.779445	14.868571	7.970000	
26	2012	20	67.507820	14.558571	7.338571	
27	2012	21	63.278685	17.667143	9.915714	
28	2012	22	71.630877	9.302857	3.711429	
29	2012	23	81.842540	10.007143	2.550000	
..	...	...	...	...	...	
92	2013	32	65.696722	17.392857	9.468571	
93	2013	33	71.339482	13.390000	5.791429	
94	2013	34	65.437931	14.931429	8.835714	
95	2013	35	69.160818	14.662857	7.574286	
96	2013	36	65.619442	17.297143	7.960000	

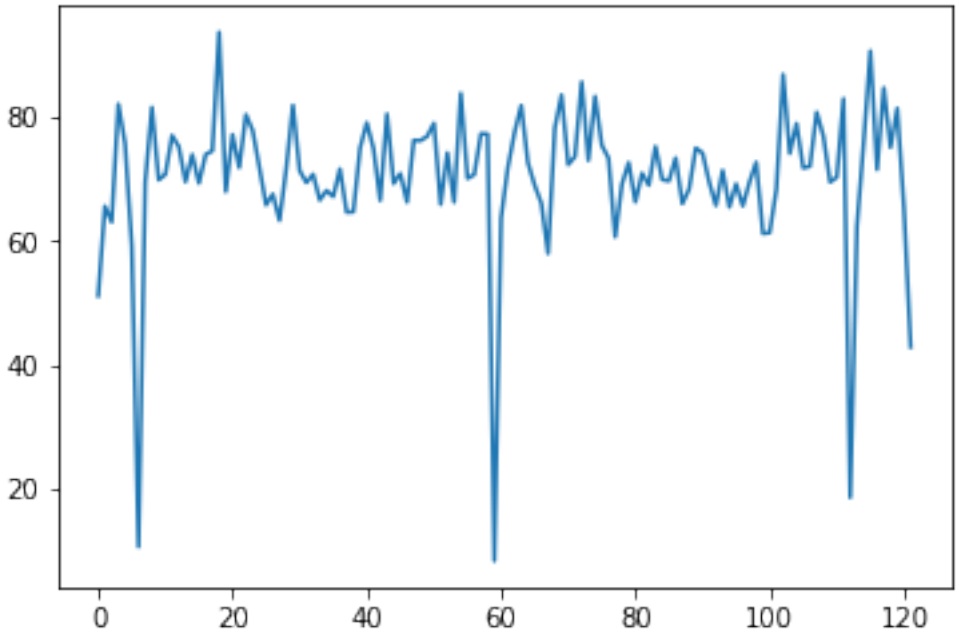
97	2013	37	69.474258	16.102857	9.318571
98	2013	38	72.644275	11.320000	6.917143
99	2013	39	61.162204	19.728571	10.490000
100	2013	40	61.307206	16.895714	9.777143
101	2013	41	68.287755	15.064286	6.961429
102	2013	42	86.817619	5.490000	-0.621429
103	2013	43	74.077658	15.445714	6.648571
104	2013	44	78.895956	10.522857	3.924286
105	2013	45	71.739465	12.672857	5.480000
106	2013	46	72.005948	12.577143	5.790000
107	2013	47	80.713782	8.850000	3.217143
108	2013	48	76.877442	9.755714	2.084286
109	2013	49	69.451989	15.714286	7.180000
110	2013	50	70.245566	15.428571	9.104286
111	2013	51	82.914623	7.230000	1.590000
112	2013	52	18.612574	4.215714	1.518571
113	2014	0	62.324195	8.642857	4.727143
114	2014	1	75.867974	12.211429	3.787143
115	2014	2	90.607556	7.085714	-0.562857
116	2014	3	71.472853	13.771429	7.548571
117	2014	4	84.648671	7.205714	0.928571
118	2014	5	75.038481	10.018571	1.710000
119	2014	6	81.339806	10.297143	3.328571
120	2014	7	65.270613	18.834286	10.725714
121	2014	8	42.866392	7.514286	2.971429

	humidity
0	0.548571
1	0.761429
2	0.720000
3	0.784286
4	0.810000
5	0.660000
6	0.122857
7	0.787143
8	0.842857
9	0.797143
10	0.761429
11	0.784286
12	0.775714
13	0.817143
14	0.818571
15	0.794286
16	0.780000
17	0.828571
18	0.940000
19	0.737143
20	0.750000

```
21   0.784286
22   0.777143
23   0.795714
24   0.847143
25   0.772857
26   0.772857
27   0.787143
28   0.804286
29   0.778571
..        ...
92   0.801429
93   0.732857
94   0.775714
95   0.754286
96   0.704286
97   0.762857
98   0.838571
99   0.696131
100  0.737143
101  0.817143
102  0.808571
103  0.730000
104  0.771429
105  0.801429
106  0.765714
107  0.788571
108  0.775714
109  0.751429
110  0.761429
111  0.844286
112  0.210000
113  0.602857
114  0.804286
115  0.825714
116  0.820000
117  0.808571
118  0.772857
119  0.795714
120  0.711429
121  0.482857

[122 rows x 6 columns]
```

```
In [83]: plt.plot(daily_week.energy_sum)
```

```
Out[83]: [<matplotlib.lines.Line2D at 0x149b7a22860>]
```




```
In [114]: #Comprovem quines son les setmanes 0
          (daily_week[daily_week.week==0])
```

Out[114]:

	year	week	energy_sum	apparentTemperatureMax	apparentTemperatureMin	humidity
6	2012	0	10.675958	1.040000	0.647143	0.122857
60	2013	0	63.657653	7.481429	2.308571	0.654286
113	2014	0	62.324195	8.642857	4.727143	0.602857

```
In [115]: (daily_week[daily_week.week==52])
```

Out[115]:

	year	week	energy_sum	apparentTemperatureMax	apparentTemperatureMin	humidity
5	2011	52	59.108348	11.164286	6.081429	0.660000
58	2012	52	77.198766	10.284286	3.937143	0.758571
112	2013	52	18.612574	4.215714	1.518571	0.210000

```
In [116]: (daily_week[daily_week.week==53])
```

```
Out[116]:     year  week  energy_sum  apparentTemperatureMax  apparentTemperatureMin  \
          59  2012    53    8.405077                2.504286                1.634286

              humidity
          59  0.111429
```

```
In [117]: #Sumem les setmanes 52 i la 0 seguent ja que son la mateixa però de diferents anys

          n1_52=daily_week.energy_sum[(daily_week.year==2011) & (daily_week.week==52)]
          n1_0= daily_week.energy_sum[(daily_week.year==2012) & (daily_week.week==0)]
          nombre1= n1_52.item() + n1_0.item()

          n2_52=daily_week.energy_sum[(daily_week.year==2012) & (daily_week.week==53)]
          n2_0=daily_week.energy_sum[(daily_week.year==2013) & (daily_week.week==0)]

          nombre2=n2_52.item() + n2_0.item()

          n3_52=daily_week.energy_sum[(daily_week.year==2013) & (daily_week.week==52)]
          n3_0=daily_week.energy_sum[(daily_week.year==2014) & (daily_week.week==0)]
          nombre3=n3_52.item() + n3_0.item()

          daily_week.energy_sum[(daily_week.year==2011) & (daily_week.week==52)]=nombre1

          daily_week.energy_sum[(daily_week.year==2013) & (daily_week.week==0)]=nombre2
          daily_week.energy_sum[(daily_week.year==2014) & (daily_week.week==0)]=nombre3


          daily_week
```

```
c:\users\laura\appdata\local\programs\python\python37\lib\site-packages\ipykernel_launcher.py:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stable/indexing.html
  app.launch_new_instance()
c:\users\laura\appdata\local\programs\python\python37\lib\site-packages\ipykernel_launcher.py:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stable/indexing.html
c:\users\laura\appdata\local\programs\python\python37\lib\site-packages\ipykernel_launcher.py:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stable/indexing.html
```

```
Out[117]:     year  week  energy_sum  apparentTemperatureMax  apparentTemperatureMin  \
          0  2011    47   51.114714               10.095714                5.961429
          1  2011    48   65.571115               15.875714                9.022857
          2  2011    49   63.016513               16.750000                8.231429
```

3	2011	50	82.034950	9.774286	3.814286
4	2011	51	75.672988	11.110000	3.368571
5	2011	52	69.784306	11.164286	6.081429
6	2012	0	10.675958	1.040000	0.647143
7	2012	1	69.481120	14.865714	7.614286
8	2012	2	81.510830	9.342857	2.102857
9	2012	3	69.813180	13.925714	5.900000
10	2012	4	70.707853	12.135714	5.530000
11	2012	5	76.962281	8.830000	3.474286
12	2012	6	75.172341	9.570000	2.197143
13	2012	7	69.506432	15.700000	8.051429
14	2012	8	73.889743	12.904286	5.058571
15	2012	9	69.289775	12.691429	4.948571
16	2012	10	73.896709	13.701429	5.530000
17	2012	11	74.495490	11.690000	4.030000
18	2012	12	93.630022	7.652857	0.781429
19	2012	13	67.918920	16.068571	8.272857
20	2012	14	77.113029	11.010000	3.384286
21	2012	15	71.793072	15.174286	7.370000
22	2012	16	80.333027	9.405714	1.280000
23	2012	17	77.781531	9.944286	4.030000
24	2012	18	71.854679	12.860000	7.991429
25	2012	19	65.779445	14.868571	7.970000
26	2012	20	67.507820	14.558571	7.338571
27	2012	21	63.278685	17.667143	9.915714
28	2012	22	71.630877	9.302857	3.711429
29	2012	23	81.842540	10.007143	2.550000
..	...	...	...	...	...
92	2013	32	65.696722	17.392857	9.468571
93	2013	33	71.339482	13.390000	5.791429
94	2013	34	65.437931	14.931429	8.835714
95	2013	35	69.160818	14.662857	7.574286
96	2013	36	65.619442	17.297143	7.960000
97	2013	37	69.474258	16.102857	9.318571
98	2013	38	72.644275	11.320000	6.917143
99	2013	39	61.162204	19.728571	10.490000
100	2013	40	61.307206	16.895714	9.777143
101	2013	41	68.287755	15.064286	6.961429
102	2013	42	86.817619	5.490000	-0.621429
103	2013	43	74.077658	15.445714	6.648571
104	2013	44	78.895956	10.522857	3.924286
105	2013	45	71.739465	12.672857	5.480000
106	2013	46	72.005948	12.577143	5.790000
107	2013	47	80.713782	8.850000	3.217143
108	2013	48	76.877442	9.755714	2.084286
109	2013	49	69.451989	15.714286	7.180000
110	2013	50	70.245566	15.428571	9.104286
111	2013	51	82.914623	7.230000	1.590000

112	2013	52	18.612574	4.215714	1.518571
113	2014	0	80.936769	8.642857	4.727143
114	2014	1	75.867974	12.211429	3.787143
115	2014	2	90.607556	7.085714	-0.562857
116	2014	3	71.472853	13.771429	7.548571
117	2014	4	84.648671	7.205714	0.928571
118	2014	5	75.038481	10.018571	1.710000
119	2014	6	81.339806	10.297143	3.328571
120	2014	7	65.270613	18.834286	10.725714
121	2014	8	42.866392	7.514286	2.971429

	humidity
0	0.548571
1	0.761429
2	0.720000
3	0.784286
4	0.810000
5	0.660000
6	0.122857
7	0.787143
8	0.842857
9	0.797143
10	0.761429
11	0.784286
12	0.775714
13	0.817143
14	0.818571
15	0.794286
16	0.780000
17	0.828571
18	0.940000
19	0.737143
20	0.750000
21	0.784286
22	0.777143
23	0.795714
24	0.847143
25	0.772857
26	0.772857
27	0.787143
28	0.804286
29	0.778571
..	...
92	0.801429
93	0.732857
94	0.775714
95	0.754286
96	0.704286

```
97   0.762857
98   0.838571
99   0.696131
100  0.737143
101  0.817143
102  0.808571
103  0.730000
104  0.771429
105  0.801429
106  0.765714
107  0.788571
108  0.775714
109  0.751429
110  0.761429
111  0.844286
112  0.210000
113  0.602857
114  0.804286
115  0.825714
116  0.820000
117  0.808571
118  0.772857
119  0.795714
120  0.711429
121  0.482857

[122 rows x 6 columns]
```

In [118]:
```
#Les eliminem (setmana 0 del 2012, setmana 53 del 2012  i setmana 52 del 2013)
daily_week=daily_week.drop([6,59,112])
daily_week
```

Out[118]:

	year	week	energy_sum	apparentTemperatureMax	apparentTemperatureMin	\
0	2011	47	51.114714	10.095714	5.961429	
1	2011	48	65.571115	15.875714	9.022857	
2	2011	49	63.016513	16.750000	8.231429	
3	2011	50	82.034950	9.774286	3.814286	
4	2011	51	75.672988	11.110000	3.368571	
5	2011	52	69.784306	11.164286	6.081429	
7	2012	1	69.481120	14.865714	7.614286	
8	2012	2	81.510830	9.342857	2.102857	
9	2012	3	69.813180	13.925714	5.900000	
10	2012	4	70.707853	12.135714	5.530000	
11	2012	5	76.962281	8.830000	3.474286	
12	2012	6	75.172341	9.570000	2.197143	
13	2012	7	69.506432	15.700000	8.051429	
14	2012	8	73.889743	12.904286	5.058571	
15	2012	9	69.289775	12.691429	4.948571	

```
16   2012    10   73.896709          13.701429           5.530000
17   2012    11   74.495490          11.690000           4.030000
18   2012    12   93.630022           7.652857           0.781429
19   2012    13   67.918920          16.068571           8.272857
20   2012    14   77.113029          11.010000           3.384286
21   2012    15   71.793072          15.174286           7.370000
22   2012    16   80.333027           9.405714           1.280000
23   2012    17   77.781531           9.944286           4.030000
24   2012    18   71.854679          12.860000           7.991429
25   2012    19   65.779445          14.868571           7.970000
26   2012    20   67.507820          14.558571           7.338571
27   2012    21   63.278685          17.667143           9.915714
28   2012    22   71.630877           9.302857           3.711429
29   2012    23   81.842540          10.007143           2.550000
30   2012    24   71.303870          10.495714           5.360000
..    ...   ...         ...                ...                ...
91   2013    31   69.440865          11.535714           3.524286
92   2013    32   65.696722          17.392857           9.468571
93   2013    33   71.339482          13.390000           5.791429
94   2013    34   65.437931          14.931429           8.835714
95   2013    35   69.160818          14.662857           7.574286
96   2013    36   65.619442          17.297143           7.960000
97   2013    37   69.474258          16.102857           9.318571
98   2013    38   72.644275          11.320000           6.917143
99   2013    39   61.162204          19.728571          10.490000
100  2013    40   61.307206          16.895714           9.777143
101  2013    41   68.287755          15.064286           6.961429
102  2013    42   86.817619           5.490000          -0.621429
103  2013    43   74.077658          15.445714           6.648571
104  2013    44   78.895956          10.522857           3.924286
105  2013    45   71.739465          12.672857           5.480000
106  2013    46   72.005948          12.577143           5.790000
107  2013    47   80.713782           8.850000           3.217143
108  2013    48   76.877442           9.755714           2.084286
109  2013    49   69.451989          15.714286           7.180000
110  2013    50   70.245566          15.428571           9.104286
111  2013    51   82.914623           7.230000           1.590000
113  2014     0   80.936769           8.642857           4.727143
114  2014     1   75.867974          12.211429           3.787143
115  2014     2   90.607556           7.085714          -0.562857
116  2014     3   71.472853          13.771429           7.548571
117  2014     4   84.648671           7.205714           0.928571
118  2014     5   75.038481          10.018571           1.710000
119  2014     6   81.339806          10.297143           3.328571
120  2014     7   65.270613          18.834286          10.725714
121  2014     8   42.866392           7.514286           2.971429

     humidity
```

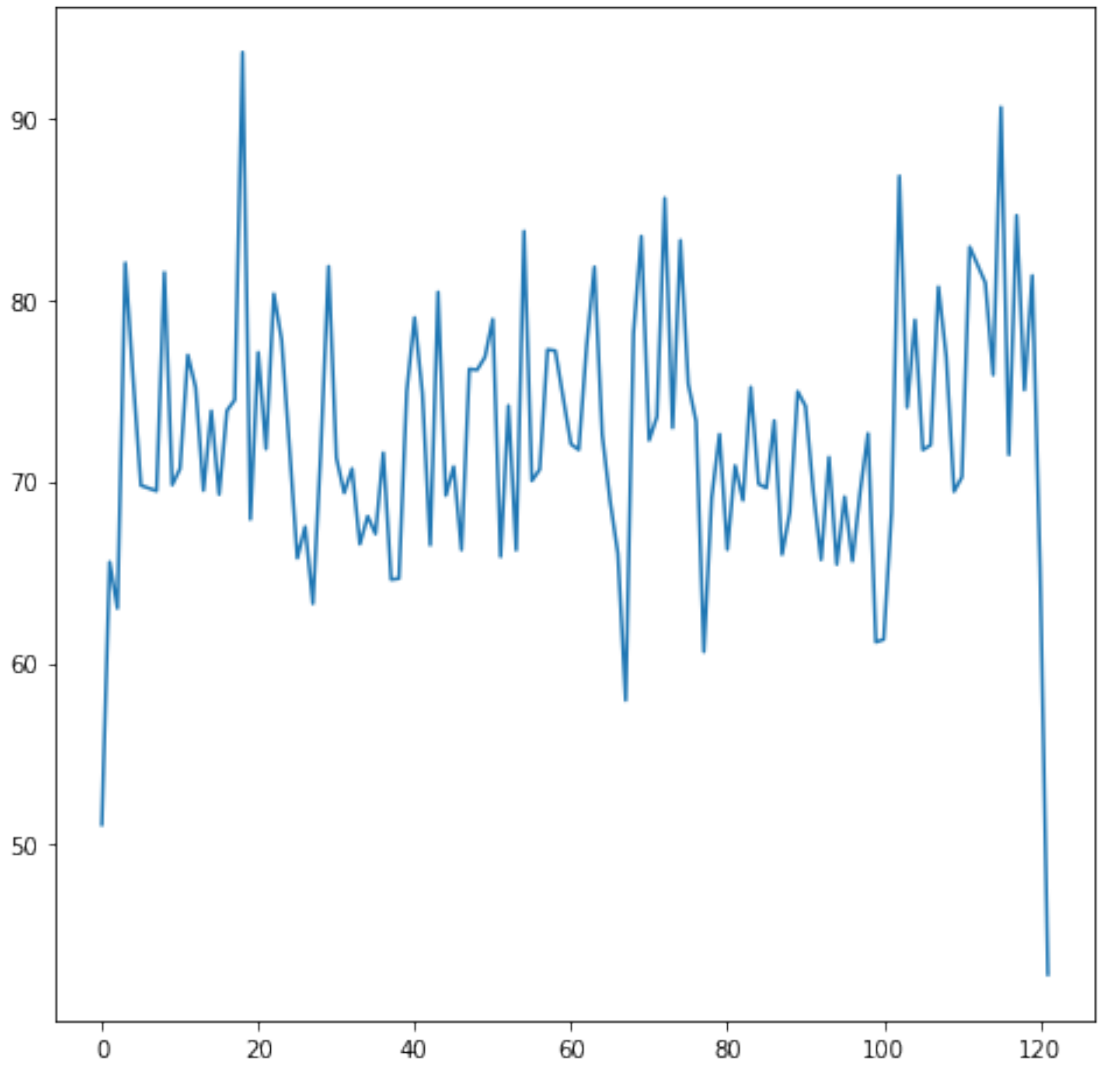
```
0     0.548571
1     0.761429
2     0.720000
3     0.784286
4     0.810000
5     0.660000
7     0.787143
8     0.842857
9     0.797143
10    0.761429
11    0.784286
12    0.775714
13    0.817143
14    0.818571
15    0.794286
16    0.780000
17    0.828571
18    0.940000
19    0.737143
20    0.750000
21    0.784286
22    0.777143
23    0.795714
24    0.847143
25    0.772857
26    0.772857
27    0.787143
28    0.804286
29    0.778571
30    0.792857
..         ...
91    0.672857
92    0.801429
93    0.732857
94    0.775714
95    0.754286
96    0.704286
97    0.762857
98    0.838571
99    0.696131
100   0.737143
101   0.817143
102   0.808571
103   0.730000
104   0.771429
105   0.801429
106   0.765714
107   0.788571
```

```
108  0.775714
109  0.751429
110  0.761429
111  0.844286
113  0.602857
114  0.804286
115  0.825714
116  0.820000
117  0.808571
118  0.772857
119  0.795714
120  0.711429
121  0.482857

[119 rows x 6 columns]
```

In [ ]:

In [119]:
```
plt.figure(figsize=(8,8))

plt.plot(daily_week.energy_sum )
```

Out[119]:
```
[<matplotlib.lines.Line2D at 0x149b7d0fc18>]
```



Ja tenim el fitxer preparat.

```
In [120]: daily_week['t-1']=daily_week['energy_sum'].shift(1)
          daily_week['t-2']=daily_week['energy_sum'].shift(2)
          daily_week['t-3']=daily_week['energy_sum'].shift(3)
          daily_week['t-4']=daily_week['energy_sum'].shift(4)
          daily_week['t-5']=daily_week['energy_sum'].shift(5)
          daily_week['t-6']=daily_week['energy_sum'].shift(6)
          daily_week['t-7']=daily_week['energy_sum'].shift(7)

          daily_week['temp(t-1)']=daily_week['apparentTemperatureMax'].shift(1)
          daily_week['temp(t-2)']=daily_week['apparentTemperatureMax'].shift(2)
          daily_week['temp(t-3)']=daily_week['apparentTemperatureMax'].shift(3)
          daily_week['temp(t-4)']=daily_week['apparentTemperatureMax'].shift(4)
          daily_week['temp(t-5)']=daily_week['apparentTemperatureMax'].shift(5)
```

```
daily_week['temp(t-6)']=daily_week['apparentTemperatureMax'].shift(6)
daily_week['temp(t-7)']=daily_week['apparentTemperatureMax'].shift(7)
daily_week['temp(t-8)']=daily_week['apparentTemperatureMax'].shift(8)

daily_week['tempmin(t-1)']=daily_week['apparentTemperatureMin'].shift(1)
daily_week['tempmin(t-2)']=daily_week['apparentTemperatureMin'].shift(2)
daily_week['tempmin(t-3)']=daily_week['apparentTemperatureMin'].shift(3)
daily_week['tempmin(t-4)']=daily_week['apparentTemperatureMin'].shift(4)
daily_week['tempmin(t-5)']=daily_week['apparentTemperatureMin'].shift(5)
daily_week['tempmin(t-6)']=daily_week['apparentTemperatureMin'].shift(6)
daily_week['tempmin(t-7)']=daily_week['apparentTemperatureMin'].shift(7)
daily_week['tempmin(t-8)']=daily_week['apparentTemperatureMin'].shift(8)

daily_week['humidity(t-1)']=daily_week['humidity'].shift(1)
daily_week['humidity(t-2)']=daily_week['humidity'].shift(2)
daily_week['humidity(t-3)']=daily_week['humidity'].shift(3)
daily_week['humidity(t-4)']=daily_week['humidity'].shift(4)
daily_week['humidity(t-5)']=daily_week['humidity'].shift(5)
daily_week['humidity(t-6)']=daily_week['humidity'].shift(6)
daily_week['humidity(t-7)']=daily_week['humidity'].shift(7)
daily_week['humidity(t-8)']=daily_week['humidity'].shift(8)
```

```
daily_week
```

Out[120]:

	year	week	energy_sum	apparentTemperatureMax	apparentTemperatureMin	\
0	2011	47	51.114714	10.095714	5.961429	
1	2011	48	65.571115	15.875714	9.022857	
2	2011	49	63.016513	16.750000	8.231429	
3	2011	50	82.034950	9.774286	3.814286	
4	2011	51	75.672988	11.110000	3.368571	
5	2011	52	69.784306	11.164286	6.081429	
7	2012	1	69.481120	14.865714	7.614286	
8	2012	2	81.510830	9.342857	2.102857	
9	2012	3	69.813180	13.925714	5.900000	
10	2012	4	70.707853	12.135714	5.530000	
11	2012	5	76.962281	8.830000	3.474286	
12	2012	6	75.172341	9.570000	2.197143	
13	2012	7	69.506432	15.700000	8.051429	
14	2012	8	73.889743	12.904286	5.058571	
15	2012	9	69.289775	12.691429	4.948571	
16	2012	10	73.896709	13.701429	5.530000	
17	2012	11	74.495490	11.690000	4.030000	
18	2012	12	93.630022	7.652857	0.781429	
19	2012	13	67.918920	16.068571	8.272857	
20	2012	14	77.113029	11.010000	3.384286	
21	2012	15	71.793072	15.174286	7.370000	
22	2012	16	80.333027	9.405714	1.280000	

23	2012	17	77.781531	9.944286	4.030000
24	2012	18	71.854679	12.860000	7.991429
25	2012	19	65.779445	14.868571	7.970000
26	2012	20	67.507820	14.558571	7.338571
27	2012	21	63.278685	17.667143	9.915714
28	2012	22	71.630877	9.302857	3.711429
29	2012	23	81.842540	10.007143	2.550000
30	2012	24	71.303870	10.495714	5.360000
..	...	...	...	...	...
91	2013	31	69.440865	11.535714	3.524286
92	2013	32	65.696722	17.392857	9.468571
93	2013	33	71.339482	13.390000	5.791429
94	2013	34	65.437931	14.931429	8.835714
95	2013	35	69.160818	14.662857	7.574286
96	2013	36	65.619442	17.297143	7.960000
97	2013	37	69.474258	16.102857	9.318571
98	2013	38	72.644275	11.320000	6.917143
99	2013	39	61.162204	19.728571	10.490000
100	2013	40	61.307206	16.895714	9.777143
101	2013	41	68.287755	15.064286	6.961429
102	2013	42	86.817619	5.490000	-0.621429
103	2013	43	74.077658	15.445714	6.648571
104	2013	44	78.895956	10.522857	3.924286
105	2013	45	71.739465	12.672857	5.480000
106	2013	46	72.005948	12.577143	5.790000
107	2013	47	80.713782	8.850000	3.217143
108	2013	48	76.877442	9.755714	2.084286
109	2013	49	69.451989	15.714286	7.180000
110	2013	50	70.245566	15.428571	9.104286
111	2013	51	82.914623	7.230000	1.590000
113	2014	0	80.936769	8.642857	4.727143
114	2014	1	75.867974	12.211429	3.787143
115	2014	2	90.607556	7.085714	-0.562857
116	2014	3	71.472853	13.771429	7.548571
117	2014	4	84.648671	7.205714	0.928571
118	2014	5	75.038481	10.018571	1.710000
119	2014	6	81.339806	10.297143	3.328571
120	2014	7	65.270613	18.834286	10.725714
121	2014	8	42.866392	7.514286	2.971429

	humidity	t-1	t-2	t-3	t-4	...	tempmin(t-7)	\
0	0.548571	NaN	NaN	NaN	NaN	...	NaN	
1	0.761429	51.114714	NaN	NaN	NaN	...	NaN	
2	0.720000	65.571115	51.114714	NaN	NaN	...	NaN	
3	0.784286	63.016513	65.571115	51.114714	NaN	...	NaN	
4	0.810000	82.034950	63.016513	65.571115	51.114714	...	NaN	
5	0.660000	75.672988	82.034950	63.016513	65.571115	...	NaN	
7	0.787143	69.784306	75.672988	82.034950	63.016513	...	NaN	

8	0.842857	69.481120	69.784306	75.672988	82.034950	...	5.961429
9	0.797143	81.510830	69.481120	69.784306	75.672988	...	9.022857
10	0.761429	69.813180	81.510830	69.481120	69.784306	...	8.231429
11	0.784286	70.707853	69.813180	81.510830	69.481120	...	3.814286
12	0.775714	76.962281	70.707853	69.813180	81.510830	...	3.368571
13	0.817143	75.172341	76.962281	70.707853	69.813180	...	6.081429
14	0.818571	69.506432	75.172341	76.962281	70.707853	...	7.614286
15	0.794286	73.889743	69.506432	75.172341	76.962281	...	2.102857
16	0.780000	69.289775	73.889743	69.506432	75.172341	...	5.900000
17	0.828571	73.896709	69.289775	73.889743	69.506432	...	5.530000
18	0.940000	74.495490	73.896709	69.289775	73.889743	...	3.474286
19	0.737143	93.630022	74.495490	73.896709	69.289775	...	2.197143
20	0.750000	67.918920	93.630022	74.495490	73.896709	...	8.051429
21	0.784286	77.113029	67.918920	93.630022	74.495490	...	5.058571
22	0.777143	71.793072	77.113029	67.918920	93.630022	...	4.948571
23	0.795714	80.333027	71.793072	77.113029	67.918920	...	5.530000
24	0.847143	77.781531	80.333027	71.793072	77.113029	...	4.030000
25	0.772857	71.854679	77.781531	80.333027	71.793072	...	0.781429
26	0.772857	65.779445	71.854679	77.781531	80.333027	...	8.272857
27	0.787143	67.507820	65.779445	71.854679	77.781531	...	3.384286
28	0.804286	63.278685	67.507820	65.779445	71.854679	...	7.370000
29	0.778571	71.630877	63.278685	67.507820	65.779445	...	1.280000
30	0.792857	81.842540	71.630877	63.278685	67.507820	...	4.030000
..	...	...	...	...	...	...	...
91	0.672857	74.145410	74.954583	68.316695	65.981932	...	9.315714
92	0.801429	69.440865	74.145410	74.954583	68.316695	...	6.275714
93	0.732857	65.696722	69.440865	74.145410	74.954583	...	6.450000
94	0.775714	71.339482	65.696722	69.440865	74.145410	...	9.957143
95	0.754286	65.437931	71.339482	65.696722	69.440865	...	8.422857
96	0.704286	69.160818	65.437931	71.339482	65.696722	...	4.267143
97	0.762857	65.619442	69.160818	65.437931	71.339482	...	4.417143
98	0.838571	69.474258	65.619442	69.160818	65.437931	...	3.524286
99	0.696131	72.644275	69.474258	65.619442	69.160818	...	9.468571
100	0.737143	61.162204	72.644275	69.474258	65.619442	...	5.791429
101	0.817143	61.307206	61.162204	72.644275	69.474258	...	8.835714
102	0.808571	68.287755	61.307206	61.162204	72.644275	...	7.574286
103	0.730000	86.817619	68.287755	61.307206	61.162204	...	7.960000
104	0.771429	74.077658	86.817619	68.287755	61.307206	...	9.318571
105	0.801429	78.895956	74.077658	86.817619	68.287755	...	6.917143
106	0.765714	71.739465	78.895956	74.077658	86.817619	...	10.490000
107	0.788571	72.005948	71.739465	78.895956	74.077658	...	9.777143
108	0.775714	80.713782	72.005948	71.739465	78.895956	...	6.961429
109	0.751429	76.877442	80.713782	72.005948	71.739465	...	-0.621429
110	0.761429	69.451989	76.877442	80.713782	72.005948	...	6.648571
111	0.844286	70.245566	69.451989	76.877442	80.713782	...	3.924286
113	0.602857	82.914623	70.245566	69.451989	76.877442	...	5.480000
114	0.804286	80.936769	82.914623	70.245566	69.451989	...	5.790000
115	0.825714	75.867974	80.936769	82.914623	70.245566	...	3.217143

```
116  0.820000  90.607556  75.867974  80.936769  82.914623  ...       2.084286
117  0.808571  71.472853  90.607556  75.867974  80.936769  ...       7.180000
118  0.772857  84.648671  71.472853  90.607556  75.867974  ...       9.104286
119  0.795714  75.038481  84.648671  71.472853  90.607556  ...       1.590000
120  0.711429  81.339806  75.038481  84.648671  71.472853  ...       4.727143
121  0.482857  65.270613  81.339806  75.038481  84.648671  ...       3.787143

     tempmin(t-8)  humidity(t-1)  humidity(t-2)  humidity(t-3)  humidity(t-4)  \
0             NaN            NaN            NaN            NaN            NaN
1             NaN       0.548571            NaN            NaN            NaN
2             NaN       0.761429       0.548571            NaN            NaN
3             NaN       0.720000       0.761429       0.548571            NaN
4             NaN       0.784286       0.720000       0.761429       0.548571
5             NaN       0.810000       0.784286       0.720000       0.761429
7             NaN       0.660000       0.810000       0.784286       0.720000
8             NaN       0.787143       0.660000       0.810000       0.784286
9        5.961429       0.842857       0.787143       0.660000       0.810000
10       9.022857       0.797143       0.842857       0.787143       0.660000
11       8.231429       0.761429       0.797143       0.842857       0.787143
12       3.814286       0.784286       0.761429       0.797143       0.842857
13       3.368571       0.775714       0.784286       0.761429       0.797143
14       6.081429       0.817143       0.775714       0.784286       0.761429
15       7.614286       0.818571       0.817143       0.775714       0.784286
16       2.102857       0.794286       0.818571       0.817143       0.775714
17       5.900000       0.780000       0.794286       0.818571       0.817143
18       5.530000       0.828571       0.780000       0.794286       0.818571
19       3.474286       0.940000       0.828571       0.780000       0.794286
20       2.197143       0.737143       0.940000       0.828571       0.780000
21       8.051429       0.750000       0.737143       0.940000       0.828571
22       5.058571       0.784286       0.750000       0.737143       0.940000
23       4.948571       0.777143       0.784286       0.750000       0.737143
24       5.530000       0.795714       0.777143       0.784286       0.750000
25       4.030000       0.847143       0.795714       0.777143       0.784286
26       0.781429       0.772857       0.847143       0.795714       0.777143
27       8.272857       0.772857       0.772857       0.847143       0.795714
28       3.384286       0.787143       0.772857       0.772857       0.847143
29       7.370000       0.804286       0.787143       0.772857       0.772857
30       1.280000       0.778571       0.804286       0.787143       0.772857
..            ...            ...            ...            ...            ...
91       4.847143       0.787143       0.804286       0.761429       0.838571
92       9.315714       0.672857       0.787143       0.804286       0.761429
93       6.275714       0.801429       0.672857       0.787143       0.804286
94       6.450000       0.732857       0.801429       0.672857       0.787143
95       9.957143       0.775714       0.732857       0.801429       0.672857
96       8.422857       0.754286       0.775714       0.732857       0.801429
97       4.267143       0.704286       0.754286       0.775714       0.732857
98       4.417143       0.762857       0.704286       0.754286       0.775714
99       3.524286       0.838571       0.762857       0.704286       0.754286
```

100	9.468571	0.696131	0.838571	0.762857	0.704286
101	5.791429	0.737143	0.696131	0.838571	0.762857
102	8.835714	0.817143	0.737143	0.696131	0.838571
103	7.574286	0.808571	0.817143	0.737143	0.696131
104	7.960000	0.730000	0.808571	0.817143	0.737143
105	9.318571	0.771429	0.730000	0.808571	0.817143
106	6.917143	0.801429	0.771429	0.730000	0.808571
107	10.490000	0.765714	0.801429	0.771429	0.730000
108	9.777143	0.788571	0.765714	0.801429	0.771429
109	6.961429	0.775714	0.788571	0.765714	0.801429
110	-0.621429	0.751429	0.775714	0.788571	0.765714
111	6.648571	0.761429	0.751429	0.775714	0.788571
113	3.924286	0.844286	0.761429	0.751429	0.775714
114	5.480000	0.602857	0.844286	0.761429	0.751429
115	5.790000	0.804286	0.602857	0.844286	0.761429
116	3.217143	0.825714	0.804286	0.602857	0.844286
117	2.084286	0.820000	0.825714	0.804286	0.602857
118	7.180000	0.808571	0.820000	0.825714	0.804286
119	9.104286	0.772857	0.808571	0.820000	0.825714
120	1.590000	0.795714	0.772857	0.808571	0.820000
121	4.727143	0.711429	0.795714	0.772857	0.808571

	humidity(t-5)	humidity(t-6)	humidity(t-7)	humidity(t-8)
0	NaN	NaN	NaN	NaN
1	NaN	NaN	NaN	NaN
2	NaN	NaN	NaN	NaN
3	NaN	NaN	NaN	NaN
4	NaN	NaN	NaN	NaN
5	0.548571	NaN	NaN	NaN
7	0.761429	0.548571	NaN	NaN
8	0.720000	0.761429	0.548571	NaN
9	0.784286	0.720000	0.761429	0.548571
10	0.810000	0.784286	0.720000	0.761429
11	0.660000	0.810000	0.784286	0.720000
12	0.787143	0.660000	0.810000	0.784286
13	0.842857	0.787143	0.660000	0.810000
14	0.797143	0.842857	0.787143	0.660000
15	0.761429	0.797143	0.842857	0.787143
16	0.784286	0.761429	0.797143	0.842857
17	0.775714	0.784286	0.761429	0.797143
18	0.817143	0.775714	0.784286	0.761429
19	0.818571	0.817143	0.775714	0.784286
20	0.794286	0.818571	0.817143	0.775714
21	0.780000	0.794286	0.818571	0.817143
22	0.828571	0.780000	0.794286	0.818571
23	0.940000	0.828571	0.780000	0.794286
24	0.737143	0.940000	0.828571	0.780000
25	0.750000	0.737143	0.940000	0.828571

```
26        0.784286       0.750000       0.737143       0.940000
27        0.777143       0.784286       0.750000       0.737143
28        0.795714       0.777143       0.784286       0.750000
29        0.847143       0.795714       0.777143       0.784286
30        0.772857       0.847143       0.795714       0.777143
..             ...            ...            ...            ...
91        0.835714       0.737143       0.800000       0.851429
92        0.838571       0.835714       0.737143       0.800000
93        0.761429       0.838571       0.835714       0.737143
94        0.804286       0.761429       0.838571       0.835714
95        0.787143       0.804286       0.761429       0.838571
96        0.672857       0.787143       0.804286       0.761429
97        0.801429       0.672857       0.787143       0.804286
98        0.732857       0.801429       0.672857       0.787143
99        0.775714       0.732857       0.801429       0.672857
100       0.754286       0.775714       0.732857       0.801429
101       0.704286       0.754286       0.775714       0.732857
102       0.762857       0.704286       0.754286       0.775714
103       0.838571       0.762857       0.704286       0.754286
104       0.696131       0.838571       0.762857       0.704286
105       0.737143       0.696131       0.838571       0.762857
106       0.817143       0.737143       0.696131       0.838571
107       0.808571       0.817143       0.737143       0.696131
108       0.730000       0.808571       0.817143       0.737143
109       0.771429       0.730000       0.808571       0.817143
110       0.801429       0.771429       0.730000       0.808571
111       0.765714       0.801429       0.771429       0.730000
113       0.788571       0.765714       0.801429       0.771429
114       0.775714       0.788571       0.765714       0.801429
115       0.751429       0.775714       0.788571       0.765714
116       0.761429       0.751429       0.775714       0.788571
117       0.844286       0.761429       0.751429       0.775714
118       0.602857       0.844286       0.761429       0.751429
119       0.804286       0.602857       0.844286       0.761429
120       0.825714       0.804286       0.602857       0.844286
121       0.820000       0.825714       0.804286       0.602857

[119 rows x 37 columns]
```

In [121]:
```
#Ens quedem amb energies i temperatures passades
daily_week=daily_week[['energy_sum','t-1','t-2','t-3','t-4','t-5','t-6','t-7','temp(t
daily_week.head(5)
```

Out[121]:
```
   energy_sum        t-1        t-2        t-3        t-4  t-5  t-6  t-7  \
0   51.114714        NaN        NaN        NaN        NaN  NaN  NaN  NaN
1   65.571115  51.114714        NaN        NaN        NaN  NaN  NaN  NaN
2   63.016513  65.571115  51.114714        NaN        NaN  NaN  NaN  NaN
3   82.034950  63.016513  65.571115  51.114714        NaN  NaN  NaN  NaN
```

```
4   75.672988  82.034950  63.016513  65.571115  51.114714  NaN  NaN  NaN

   temp(t-1)  temp(t-2)  ...  tempmin(t-5)  tempmin(t-6)  tempmin(t-7)  \
0        NaN        NaN  ...           NaN           NaN           NaN
1  10.095714        NaN  ...           NaN           NaN           NaN
2  15.875714  10.095714  ...           NaN           NaN           NaN
3  16.750000  15.875714  ...           NaN           NaN           NaN
4   9.774286  16.750000  ...           NaN           NaN           NaN

   humidity(t-1)  humidity(t-2)  humidity(t-3)  humidity(t-4)  humidity(t-5)  \
0            NaN            NaN            NaN            NaN            NaN
1       0.548571            NaN            NaN            NaN            NaN
2       0.761429       0.548571            NaN            NaN            NaN
3       0.720000       0.761429       0.548571            NaN            NaN
4       0.784286       0.720000       0.761429       0.548571            NaN

   humidity(t-6)  humidity(t-7)
0            NaN            NaN
1            NaN            NaN
2            NaN            NaN
3            NaN            NaN
4            NaN            NaN

[5 rows x 29 columns]
```

```
In [122]: daily_week=daily_week.reset_index()
          daily_week=daily_week[['energy_sum','t-1','t-2','t-3','t-4','t-5','t-6','t-7','temp(t
          daily_week.head(5)
```

```
Out[122]:    energy_sum        t-1        t-2        t-3        t-4  t-5  t-6  t-7  \
          0   51.114714        NaN        NaN        NaN        NaN  NaN  NaN  NaN
          1   65.571115  51.114714        NaN        NaN        NaN  NaN  NaN  NaN
          2   63.016513  65.571115  51.114714        NaN        NaN  NaN  NaN  NaN
          3   82.034950  63.016513  65.571115  51.114714        NaN  NaN  NaN  NaN
          4   75.672988  82.034950  63.016513  65.571115  51.114714  NaN  NaN  NaN

             temp(t-1)  temp(t-2)  ...  tempmin(t-5)  tempmin(t-6)  tempmin(t-7)  \
          0        NaN        NaN  ...           NaN           NaN           NaN
          1  10.095714        NaN  ...           NaN           NaN           NaN
          2  15.875714  10.095714  ...           NaN           NaN           NaN
          3  16.750000  15.875714  ...           NaN           NaN           NaN
          4   9.774286  16.750000  ...           NaN           NaN           NaN

             humidity(t-1)  humidity(t-2)  humidity(t-3)  humidity(t-4)  humidity(t-5)  \
          0            NaN            NaN            NaN            NaN            NaN
          1       0.548571            NaN            NaN            NaN            NaN
          2       0.761429       0.548571            NaN            NaN            NaN
          3       0.720000       0.761429       0.548571            NaN            NaN
```

```
4       0.784286       0.720000       0.761429       0.548571            NaN

   humidity(t-6)  humidity(t-7)
0            NaN            NaN
1            NaN            NaN
2            NaN            NaN
3            NaN            NaN
4            NaN            NaN

[5 rows x 29 columns]
```

In [123]:
```
#Eliminem les 7 primeres files ja que contenen NaN (valors buits)
daily_week=daily_week.drop([0,1,2,3,4,5,6])
daily_week.head(5)
```

Out[123]:
```
    energy_sum        t-1        t-2        t-3        t-4        t-5  \
7    81.510830  69.481120  69.784306  75.672988  82.034950  63.016513
8    69.813180  81.510830  69.481120  69.784306  75.672988  82.034950
9    70.707853  69.813180  81.510830  69.481120  69.784306  75.672988
10   76.962281  70.707853  69.813180  81.510830  69.481120  69.784306
11   75.172341  76.962281  70.707853  69.813180  81.510830  69.481120

          t-6        t-7  temp(t-1)  temp(t-2)  ...  tempmin(t-5)  \
7   65.571115  51.114714  14.865714  11.164286  ...      8.231429
8   63.016513  65.571115   9.342857  14.865714  ...      3.814286
9   82.034950  63.016513  13.925714   9.342857  ...      3.368571
10  75.672988  82.034950  12.135714  13.925714  ...      6.081429
11  69.784306  75.672988   8.830000  12.135714  ...      7.614286

    tempmin(t-6)  tempmin(t-7)  humidity(t-1)  humidity(t-2)  humidity(t-3)  \
7       9.022857      5.961429       0.787143       0.660000       0.810000
8       8.231429      9.022857       0.842857       0.787143       0.660000
9       3.814286      8.231429       0.797143       0.842857       0.787143
10      3.368571      3.814286       0.761429       0.797143       0.842857
11      6.081429      3.368571       0.784286       0.761429       0.797143

    humidity(t-4)  humidity(t-5)  humidity(t-6)  humidity(t-7)
7        0.784286       0.720000       0.761429       0.548571
8        0.810000       0.784286       0.720000       0.761429
9        0.660000       0.810000       0.784286       0.720000
10       0.787143       0.660000       0.810000       0.784286
11       0.842857       0.787143       0.660000       0.810000

[5 rows x 29 columns]
```

In [124]:
```
len(daily_week)
```

Out[124]:
```
112
```

In [15]:

```
WARNING:tensorflow:From c:\users\laura\appdata\local\programs\python\python37\lib\site-packages
Instructions for updating:
Colocations handled automatically by placer.
```

In [125]:
```
#normalitzem
scaler=preprocessing.MinMaxScaler(feature_range=(0, 1))
daily_week_norm=scaler.fit_transform(daily_week)
```

In [126]:
```
#Partim en X i y(valor a predir)

#Seleccionem dades per y i X
y_week=daily_week_norm[:,0]
X_week=daily_week_norm[:,1:29]

#Reshape de [samples,timesteps] a [samples,timesteps,features]
#X_daily_list=X_daily.values#.tolist()
X_week=np.reshape(X_week, (X_week.shape[0],7,4))
```

In [18]:
```
len(X_week)
```

Out[18]: 112

In [127]:
```
# definim model
import tensorflow as tf
model =Sequential()
model.add(LSTM(50, activation='relu', input_shape=(7, 4)))
model.add(Dense(1))
model.compile(optimizer='adam', loss='mse')


#Walk forward per test i train
minim=2
n_train=55
lenght=len(daily_week)-1

llista_evaluate=list()
llista_prediccions=list()
llista_preditrain=list()
llista_scores=list()
llista_scoretrain=list()
sumScores=0

for i in range(n_train,lenght):
    minim=minim+1
    X_train,X_test= X_week[minim:i],X_week[i:i+1]
    y_train,y_test= y_week[minim:i],y_week[i:i+1]
```

```
        #fem fit al model
        model.fit(X_train, y_train, epochs=50, verbose=0)

        #mostrem score per cada model
        score=model.evaluate(X_test,y_test,verbose=0)
        llista_evaluate.append(score)

        #Predim per cadascun
        preditest=model.predict(X_test)
        llista_prediccions.append(preditest)

        preditrain=model.predict(X_train)
        llista_preditrain.append(preditrain)

        trainScore = math.sqrt(mean_squared_error(y_train, preditrain))
        llista_scoretrain.append(trainScore )


        testScore = math.sqrt(mean_squared_error(y_test, preditest))
        llista_scores.append(testScore)

        sumScores=sumScores+testScore
```

In [128]:
```
#Dividim la suma de scores de test entre el nombre de prediccions per obtenir la mit
sumScores/(lenght-n_train)
```

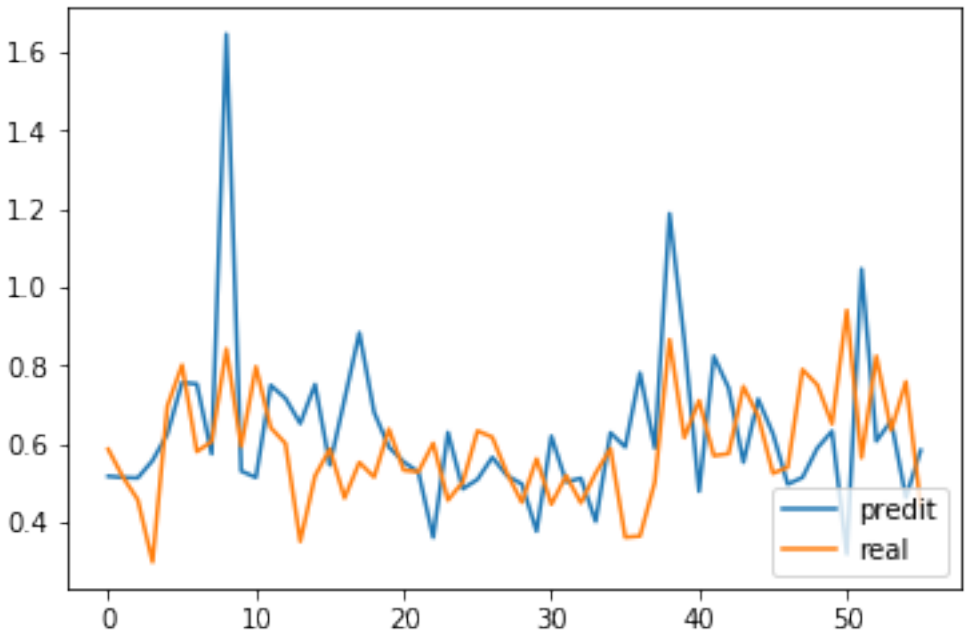
Out[128]:
```
0.16631584915639783
```

In [129]:
```
predis=list()

for i in range(len(llista_prediccions)):
    predi=llista_prediccions[i].tolist()
    predis.append(predi)

predis=np.reshape(predis, (56))

predis
```

Out[129]:
```
array([0.51621145, 0.51316804, 0.51193535, 0.5564186 , 0.62383407,
       0.75578749, 0.75215447, 0.57339066, 1.64626372, 0.52965903,
       0.51312888, 0.74897158, 0.71539843, 0.65112418, 0.75086486,
       0.54502958, 0.71273738, 0.88288522, 0.67981529, 0.59104586,
       0.55298322, 0.52689099, 0.36001083, 0.62818635, 0.483859  ,
       0.5082944 , 0.56458503, 0.51766711, 0.49654308, 0.37580773,
       0.61852551, 0.501652  , 0.51119375, 0.40089548, 0.62725884,
       0.59093058, 0.78031558, 0.58840984, 1.18748105, 0.86348218,
       0.47783431, 0.82297796, 0.74154824, 0.55200642, 0.71343583,
```

```
       0.62491882, 0.49596503, 0.51315969, 0.58814806, 0.63132554,
       0.31737161, 1.04622865, 0.60610753, 0.65778744, 0.46201631,
       0.58245802])
```

In [130]:
```
##Mostrem
plt.plot(predis, label="predit")
plt.plot(y_week[n_train:lenght], label="real")
plt.legend(loc="lower right")
plt.show()
```



In [131]:
```
prova=daily_week.iloc[n_train:lenght]
prova
#len(predis)
#lenght-n_train
prova['predi']=predis
prova['y']=y_week[n_train:lenght]
prova=prova.drop(['energy_sum','t-1'], axis=1)
prova

prova=prova[['predi','y','t-2','t-3','t-4','t-5','t-6','t-7','temp(t-1)','temp(t-2)'
prova
```

```
c:\users\laura\appdata\local\programs\python\python37\lib\site-packages\ipykernel_launcher.py:6
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead
```

```
See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stable/indexing.html

c:\users\laura\appdata\local\programs\python\python37\lib\site-packages\ipykernel_launcher.py:1
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stable/indexing.html
  import sys
```

Out[131]:

	predi	y	t-2	t-3	t-4	t-5
62	0.516211	0.585234	77.437620	71.744692	72.062731	77.198766
63	0.513168	0.513990	81.810558	77.437620	71.744692	72.062731
64	0.511935	0.456374	72.574976	81.810558	77.437620	71.744692
65	0.556419	0.297209	68.958373	72.574976	81.810558	77.437620
66	0.623834	0.695217	66.033571	68.958373	72.574976	81.810558
67	0.755787	0.800479	57.953783	66.033571	68.958373	72.574976
68	0.752154	0.579275	78.158107	57.953783	66.033571	68.958373
69	0.573391	0.604790	83.501617	78.158107	57.953783	66.033571
70	1.646264	0.841917	72.272519	83.501617	78.158107	57.953783
71	0.529659	0.592762	73.567716	72.272519	83.501617	78.158107
72	0.513129	0.796123	85.605174	73.567716	72.272519	83.501617
73	0.748972	0.640497	72.957145	85.605174	73.567716	72.272519
74	0.715398	0.599801	83.280488	72.957145	85.605174	73.567716
75	0.651124	0.349847	75.380342	83.280488	72.957145	85.605174
76	0.750865	0.516987	73.314447	75.380342	83.280488	72.957145
77	0.545030	0.585745	60.625875	73.314447	75.380342	83.280488
78	0.712737	0.460769	69.110532	60.625875	73.314447	75.380342
79	0.882885	0.551698	72.600922	69.110532	60.625875	73.314447
80	0.679815	0.514140	66.256717	72.600922	69.110532	60.625875
81	0.591046	0.636863	70.872598	66.256717	72.600922	69.110532
82	0.552983	0.531834	68.965995	70.872598	66.256717	72.600922
83	0.526891	0.527565	75.195854	68.965995	70.872598	66.256717
84	0.360011	0.600453	69.864196	75.195854	68.965995	70.872598
85	0.628186	0.455356	69.647524	69.864196	75.195854	68.965995
86	0.483859	0.501349	73.347557	69.647524	69.864196	75.195854
87	0.508294	0.632110	65.981932	73.347557	69.647524	69.864196
88	0.564585	0.616170	68.316695	65.981932	73.347557	69.647524
89	0.517667	0.523494	74.954583	68.316695	65.981932	73.347557
90	0.496543	0.449738	74.145410	74.954583	68.316695	65.981932
91	0.375808	0.560895	69.440865	74.145410	74.954583	68.316695
92	0.618526	0.444640	65.696722	69.440865	74.145410	74.954583
93	0.501652	0.517978	71.339482	65.696722	69.440865	74.145410
94	0.511194	0.448216	65.437931	71.339482	65.696722	69.440865
95	0.400895	0.524152	69.160818	65.437931	71.339482	65.696722
96	0.627259	0.586599	65.619442	69.160818	65.437931	71.339482
97	0.590931	0.360412	69.474258	65.619442	69.160818	65.437931
98	0.780316	0.363268	72.644275	69.474258	65.619442	69.160818

```
99   0.588410  0.500779  61.162204  72.644275  69.474258  65.619442
100  1.187481  0.865802  61.307206  61.162204  72.644275  69.474258
101  0.863482  0.614835  68.287755  61.307206  61.162204  72.644275
102  0.477834  0.709752  86.817619  68.287755  61.307206  61.162204
103  0.822978  0.568775  74.077658  86.817619  68.287755  61.307206
104  0.741548  0.574024  78.895956  74.077658  86.817619  68.287755
105  0.552006  0.745561  71.739465  78.895956  74.077658  86.817619
106  0.713436  0.669989  72.005948  71.739465  78.895956  74.077658
107  0.624919  0.523713  80.713782  72.005948  71.739465  78.895956
108  0.495965  0.539346  76.877442  80.713782  72.005948  71.739465
109  0.513160  0.788916  69.451989  76.877442  80.713782  72.005948
110  0.588148  0.749954  70.245566  69.451989  76.877442  80.713782
111  0.631326  0.650103  82.914623  70.245566  69.451989  76.877442
112  0.317372  0.940460  80.936769  82.914623  70.245566  69.451989
113  1.046229  0.563523  75.867974  80.936769  82.914623  70.245566
114  0.606108  0.823075  90.607556  75.867974  80.936769  82.914623
115  0.657787  0.633763  71.472853  90.607556  75.867974  80.936769
116  0.462016  0.757893  84.648671  71.472853  90.607556  75.867974
117  0.582458  0.441344  75.038481  84.648671  71.472853  90.607556

           t-6        t-7  temp(t-1)  temp(t-2)  ...  tempmin(t-5)  \
62   77.260768  70.664219  10.950000  12.012857  ...      3.937143
63   77.198766  77.260768  10.742857  10.950000  ...      2.308571
64   72.062731  77.198766  15.165714  10.742857  ...      5.054286
65   71.744692  72.062731  16.284286  15.165714  ...      4.364286
66   77.437620  71.744692  23.265714  16.284286  ...      4.078571
67   81.810558  77.437620  10.168571  23.265714  ...      3.617143
68   72.574976  81.810558   8.278571  10.168571  ...      6.892857
69   68.958373  72.574976  12.042857   8.278571  ...      8.255714
70   66.033571  68.958373  14.291429  12.042857  ...     13.784286
71   57.953783  66.033571  12.585714  14.291429  ...      2.300000
72   78.158107  57.953783  12.380000  12.585714  ...      0.571429
73   83.501617  78.158107   5.622857  12.380000  ...      5.510000
74   72.272519  83.501617  10.575714   5.622857  ...      8.212857
75   73.567716  72.272519  12.288571  10.575714  ...      3.828571
76   85.605174  73.567716  20.107143  12.288571  ...      5.085714
77   72.957145  85.605174  12.655714  20.107143  ...      0.192857
78   83.280488  72.957145  12.462857  12.655714  ...      3.547143
79   75.380342  83.280488  15.947143  12.462857  ...      4.511429
80   73.314447  75.380342  13.524286  15.947143  ...     10.581429
81   60.625875  73.314447  14.741429  13.524286  ...      6.118571
82   69.110532  60.625875  12.220000  14.741429  ...      5.967143
83   72.600922  69.110532  14.254286  12.220000  ...      7.852857
84   66.256717  72.600922  13.762857  14.254286  ...      5.730000
85   70.872598  66.256717  11.821429  13.762857  ...      8.095714
86   68.965995  70.872598  17.635714  11.821429  ...      4.847143
87   75.195854  68.965995  14.591429  17.635714  ...      9.315714
88   69.864196  75.195854  12.694286  14.591429  ...      6.275714
```

89	69.647524	69.864196	10.715714	12.694286	...	6.450000
90	73.347557	69.647524	11.535714	10.715714	...	9.957143
91	65.981932	73.347557	17.392857	11.535714	...	8.422857
92	68.316695	65.981932	13.390000	17.392857	...	4.267143
93	74.954583	68.316695	14.931429	13.390000	...	4.417143
94	74.145410	74.954583	14.662857	14.931429	...	3.524286
95	69.440865	74.145410	17.297143	14.662857	...	9.468571
96	65.696722	69.440865	16.102857	17.297143	...	5.791429
97	71.339482	65.696722	11.320000	16.102857	...	8.835714
98	65.437931	71.339482	19.728571	11.320000	...	7.574286
99	69.160818	65.437931	16.895714	19.728571	...	7.960000
100	65.619442	69.160818	15.064286	16.895714	...	9.318571
101	69.474258	65.619442	5.490000	15.064286	...	6.917143
102	72.644275	69.474258	15.445714	5.490000	...	10.490000
103	61.162204	72.644275	10.522857	15.445714	...	9.777143
104	61.307206	61.162204	12.672857	10.522857	...	6.961429
105	68.287755	61.307206	12.577143	12.672857	...	-0.621429
106	86.817619	68.287755	8.850000	12.577143	...	6.648571
107	74.077658	86.817619	9.755714	8.850000	...	3.924286
108	78.895956	74.077658	15.714286	9.755714	...	5.480000
109	71.739465	78.895956	15.428571	15.714286	...	5.790000
110	72.005948	71.739465	7.230000	15.428571	...	3.217143
111	80.713782	72.005948	8.642857	7.230000	...	2.084286
112	76.877442	80.713782	12.211429	8.642857	...	7.180000
113	69.451989	76.877442	7.085714	12.211429	...	9.104286
114	70.245566	69.451989	13.771429	7.085714	...	1.590000
115	82.914623	70.245566	7.205714	13.771429	...	4.727143
116	80.936769	82.914623	10.018571	7.205714	...	3.787143
117	75.867974	80.936769	10.297143	10.018571	...	-0.562857

	tempmin(t-6)	tempmin(t-7)	humidity(t-1)	humidity(t-2)	humidity(t-3)	\
62	4.064286	6.544286	0.845714	0.818571	0.771429	
63	3.937143	4.064286	0.740000	0.845714	0.818571	
64	2.308571	3.937143	0.722857	0.740000	0.845714	
65	5.054286	2.308571	0.777143	0.722857	0.740000	
66	4.364286	5.054286	0.697143	0.777143	0.722857	
67	4.078571	4.364286	0.798571	0.697143	0.777143	
68	3.617143	4.078571	0.817143	0.798571	0.697143	
69	6.892857	3.617143	0.775714	0.817143	0.798571	
70	8.255714	6.892857	0.767143	0.775714	0.817143	
71	13.784286	8.255714	0.937143	0.767143	0.775714	
72	2.300000	13.784286	0.757143	0.937143	0.767143	
73	0.571429	2.300000	0.742857	0.757143	0.937143	
74	5.510000	0.571429	0.808571	0.742857	0.757143	
75	8.212857	5.510000	0.737143	0.808571	0.742857	
76	3.828571	8.212857	0.735714	0.737143	0.808571	
77	5.085714	3.828571	0.775714	0.735714	0.737143	
78	0.192857	5.085714	0.811429	0.775714	0.735714	

79	3.547143	0.192857	0.770000	0.811429	0.775714
80	4.511429	3.547143	0.795714	0.770000	0.811429
81	10.581429	4.511429	0.680000	0.795714	0.770000
82	6.118571	10.581429	0.851429	0.680000	0.795714
83	5.967143	6.118571	0.800000	0.851429	0.680000
84	7.852857	5.967143	0.737143	0.800000	0.851429
85	5.730000	7.852857	0.835714	0.737143	0.800000
86	8.095714	5.730000	0.838571	0.835714	0.737143
87	4.847143	8.095714	0.761429	0.838571	0.835714
88	9.315714	4.847143	0.804286	0.761429	0.838571
89	6.275714	9.315714	0.787143	0.804286	0.761429
90	6.450000	6.275714	0.672857	0.787143	0.804286
91	9.957143	6.450000	0.801429	0.672857	0.787143
92	8.422857	9.957143	0.732857	0.801429	0.672857
93	4.267143	8.422857	0.775714	0.732857	0.801429
94	4.417143	4.267143	0.754286	0.775714	0.732857
95	3.524286	4.417143	0.704286	0.754286	0.775714
96	9.468571	3.524286	0.762857	0.704286	0.754286
97	5.791429	9.468571	0.838571	0.762857	0.704286
98	8.835714	5.791429	0.696131	0.838571	0.762857
99	7.574286	8.835714	0.737143	0.696131	0.838571
100	7.960000	7.574286	0.817143	0.737143	0.696131
101	9.318571	7.960000	0.808571	0.817143	0.737143
102	6.917143	9.318571	0.730000	0.808571	0.817143
103	10.490000	6.917143	0.771429	0.730000	0.808571
104	9.777143	10.490000	0.801429	0.771429	0.730000
105	6.961429	9.777143	0.765714	0.801429	0.771429
106	-0.621429	6.961429	0.788571	0.765714	0.801429
107	6.648571	-0.621429	0.775714	0.788571	0.765714
108	3.924286	6.648571	0.751429	0.775714	0.788571
109	5.480000	3.924286	0.761429	0.751429	0.775714
110	5.790000	5.480000	0.844286	0.761429	0.751429
111	3.217143	5.790000	0.602857	0.844286	0.761429
112	2.084286	3.217143	0.804286	0.602857	0.844286
113	7.180000	2.084286	0.825714	0.804286	0.602857
114	9.104286	7.180000	0.820000	0.825714	0.804286
115	1.590000	9.104286	0.808571	0.820000	0.825714
116	4.727143	1.590000	0.772857	0.808571	0.820000
117	3.787143	4.727143	0.795714	0.772857	0.808571

	humidity(t-4)	humidity(t-5)	humidity(t-6)	humidity(t-7)
62	0.654286	0.758571	0.715714	0.771429
63	0.771429	0.654286	0.758571	0.715714
64	0.818571	0.771429	0.654286	0.758571
65	0.845714	0.818571	0.771429	0.654286
66	0.740000	0.845714	0.818571	0.771429
67	0.722857	0.740000	0.845714	0.818571
68	0.777143	0.722857	0.740000	0.845714

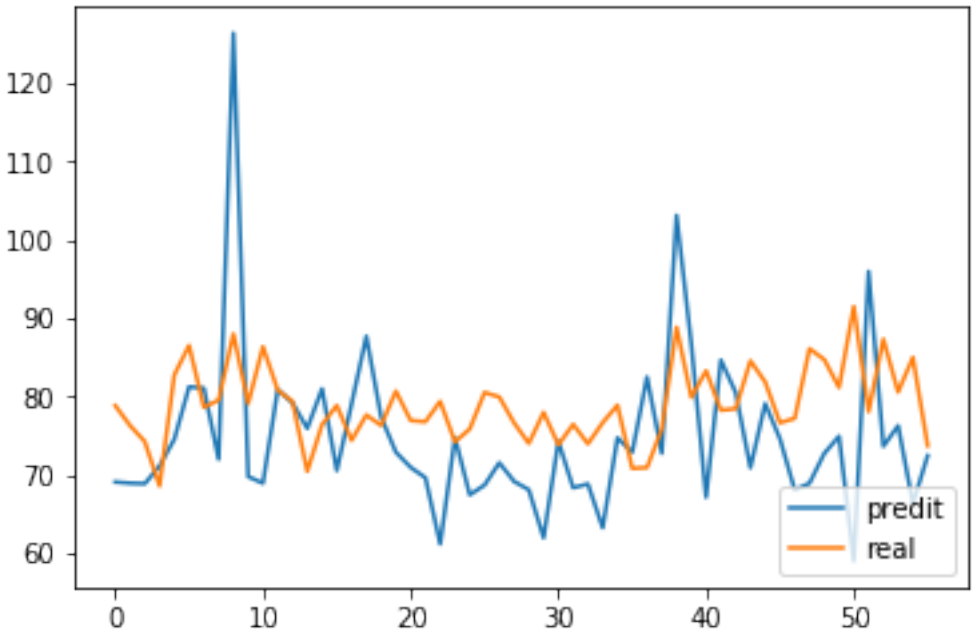
69	0.697143	0.777143	0.722857	0.740000
70	0.798571	0.697143	0.777143	0.722857
71	0.817143	0.798571	0.697143	0.777143
72	0.775714	0.817143	0.798571	0.697143
73	0.767143	0.775714	0.817143	0.798571
74	0.937143	0.767143	0.775714	0.817143
75	0.757143	0.937143	0.767143	0.775714
76	0.742857	0.757143	0.937143	0.767143
77	0.808571	0.742857	0.757143	0.937143
78	0.737143	0.808571	0.742857	0.757143
79	0.735714	0.737143	0.808571	0.742857
80	0.775714	0.735714	0.737143	0.808571
81	0.811429	0.775714	0.735714	0.737143
82	0.770000	0.811429	0.775714	0.735714
83	0.795714	0.770000	0.811429	0.775714
84	0.680000	0.795714	0.770000	0.811429
85	0.851429	0.680000	0.795714	0.770000
86	0.800000	0.851429	0.680000	0.795714
87	0.737143	0.800000	0.851429	0.680000
88	0.835714	0.737143	0.800000	0.851429
89	0.838571	0.835714	0.737143	0.800000
90	0.761429	0.838571	0.835714	0.737143
91	0.804286	0.761429	0.838571	0.835714
92	0.787143	0.804286	0.761429	0.838571
93	0.672857	0.787143	0.804286	0.761429
94	0.801429	0.672857	0.787143	0.804286
95	0.732857	0.801429	0.672857	0.787143
96	0.775714	0.732857	0.801429	0.672857
97	0.754286	0.775714	0.732857	0.801429
98	0.704286	0.754286	0.775714	0.732857
99	0.762857	0.704286	0.754286	0.775714
100	0.838571	0.762857	0.704286	0.754286
101	0.696131	0.838571	0.762857	0.704286
102	0.737143	0.696131	0.838571	0.762857
103	0.817143	0.737143	0.696131	0.838571
104	0.808571	0.817143	0.737143	0.696131
105	0.730000	0.808571	0.817143	0.737143
106	0.771429	0.730000	0.808571	0.817143
107	0.801429	0.771429	0.730000	0.808571
108	0.765714	0.801429	0.771429	0.730000
109	0.788571	0.765714	0.801429	0.771429
110	0.775714	0.788571	0.765714	0.801429
111	0.751429	0.775714	0.788571	0.765714
112	0.761429	0.751429	0.775714	0.788571
113	0.844286	0.761429	0.751429	0.775714
114	0.602857	0.844286	0.761429	0.751429
115	0.804286	0.602857	0.844286	0.761429
116	0.825714	0.804286	0.602857	0.844286

```
117        0.820000        0.825714        0.804286        0.602857

[56 rows x 29 columns]
```

In [132]:
```
predi = scaler.inverse_transform(prova)
```

In [134]:
```
#Fem una llista amb les prediccions i una llista amb y(valor real)

listpredi=list()
for i in range(len(predi)):
    listpredi.append(predi[i][0])


listy=list()
for i in range(len(predi)):
    listy.append(predi[i][1])
```

In [135]:
```
##Mostrem
plt.plot(listpredi, label="predit")
plt.plot(listy, label="real")
plt.legend(loc="lower right")
plt.show()
```

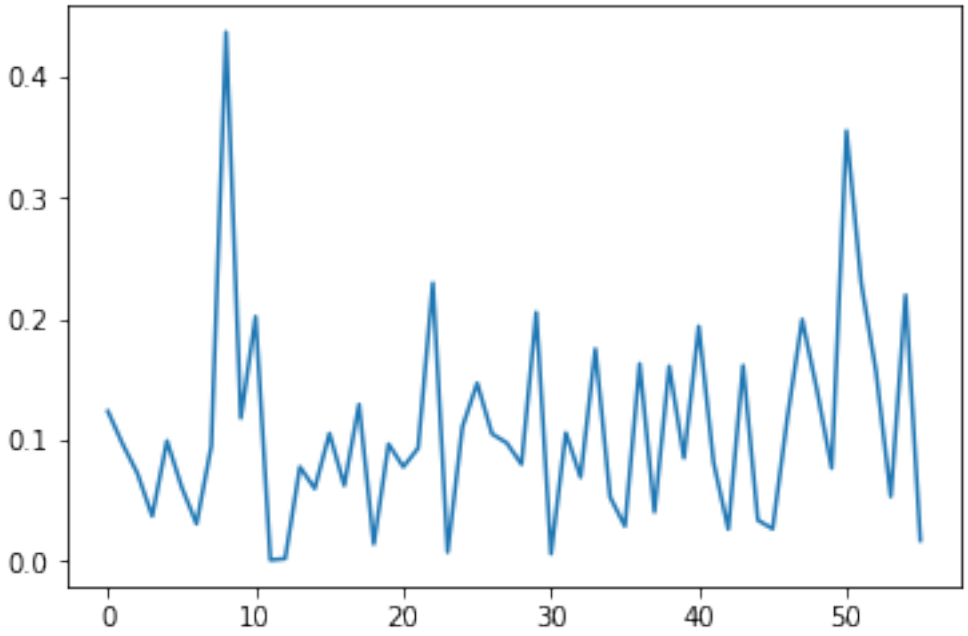


In [136]:
```
llista_errors=list()
llista_errorsabs=list()
llista_errorsres=list()
```

```
        for i in range(len(listpredi)):
            valor=listy[i]-listpredi[i]
            valorabs=math.fabs(valor)
            valorrespecte=valorabs/listy[i]
            llista_errors.append(valor)
            llista_errorsabs.append(valorabs)
            llista_errorsres.append(valorrespecte)
```

In [137]:
```
plt.plot(llista_errorsres)
```

Out[137]:
```
[<matplotlib.lines.Line2D at 0x149bade4588>]
```



In [138]:
```
sum(llista_errorsres)/(len(llista_errorsres))
```

Out[138]:
```
0.10820165177551798
```

In [ ]: