Ekstraksi Data Curah Hujan dari Raw Data Synop

Danang Eko Nuryanto

Puslitbang BMKG

27 Mei 2022

Pelatihan Pemrograman Python 2022, 10 Mei – 30 Juni 2022

Outline

- Library yang dibutuhkan
- Data synop
- Prosedur dan Langkah kerja
- Script

Contoh data synop

96749_sinop_pilot_rason_april2022 - Notepad

File Edit View

```
2022-03-01 00:07Z 303205514 FTI01 AAXX 01004 96749 01450 72005 10242 20237 30089 40102 51011 60154 76166 85422   333 20232 50710
2022-03-01 00:19Z 303207429 FTI01 TTAA 51001 96749 99010 24206 23004 00092 23203 23507 92769 20204 26022 85503 17001 26518 70135
2022-03-01 00:19Z 303207430 FTI01 TTBB 51008 96749 00010 24206 11785 13801 22751 11003 33653 07237 44636 05422 55574 00000 66469
2022-03-01 00:19Z 303207431 FTI01 PPAA 51008 96749 55385 26518 24524 27514 55340 22019 17016 13014 55220 10027 09031 77999
2022-03-01 00:19Z 303207432 FTI01 PPBB 51008 96749 90/15 23004 24513 26518 91012 24522 24527 24531 91367 25026 26012 31510 92136
2022-03-01 00:19Z 303207454 FTI01 TTCC 5100/ 96749 88999 77999
2022-03-01 00:19Z 303207455 FTI01 TTDD 5100/ 96749 31313 73508 82330
2022-03-01 03:03Z 303213768 FTI01 AAXX 01034 96749 21550 72707 10252 20242 30107 40120 52018 76162 85422  333 56000 60047 85620 8
2022-03-01 06:02Z 303219912 FTI01 AAXX 01064 96749 01559 72705 10282 20231 30084 40098 56022 60041 72166 85422    333 56000 69907
2022-03-01 06:43Z 303223198 FTI01 PPAA 51061 96749 NIL=
2022-03-01 06:44Z 303223208 FTI01 PPBB 51061 96749 NIL=
2022-03-01 09:02Z 303227788 FTI01 AAXX 01094 96749 32559 72606 10282 20230 30065 40079 58019 85422   333 56000 85620 86459
2022-03-01 12:01Z 303233389 FTI01 AAXX 01124 96749 01559 72510 10253 20230 30084 40098 53019 69921 76062 85412   333 10292 56000
2022-03-01 12:34Z 303236685 FTI01 TTAA 51121 96749 99008 27447 25008 00081 27045 22508 92767 22232 23521 85495 17817 23522 70135
2022-03-01 12:34Z 303236686 FTI01 TTBB 51128 96749 00008 27447 11956 23417 22936 23045 33901 20212 44739 11602 55673 08840 66650
2022-03-01 12:34Z 303236687 FTI01 PPAA 51128 96749 55385 23522 24018 25513 55340 20002 05526 06519 55320 10021 10545 08035 77999
2022-03-01 12:34Z 303236688 FTI01 PPBB 51128 96749 90/15 25008 23016 23522 91467 25016 26011 26509 9189/ 29510 26509 92123 23014
2022-03-01 13:50Z 303239677 FTI01 TTBB 51128 96749 00008 27447 11956 23417 22936 23045 33901 20212 44739 11602 55673 08840 66650
2022-03-01 13:50Z 303239678 FTI01 PPAA 51128 96749 55385 23522 24018 25513 55340 20002 05526 06519 55320 10021 10545 08035 77999
2022-03-01 13:50Z 303239679 FTI01 PPBB 51128 96749 90/15 25008 23016 23522 91467 25016 26011 26509 9189/ 29510 26509 92123 23014
2022-03-01 13:50Z 303239680 FTI01 TTCC 51122 96749 70863 77566 25022 50059 67372 09519 30373 60184 09551 20628 52386 10052 88999
2022-03-01 13:50Z 303239681 FTI01 TTDD 5112/ 96749 11894 81962 22858 81163 33817 75565 44767 74166 55674 78566 66594 76566 77512
2022-03-01 13:50Z 303239682 FTI01 PPCC 51128 96749 55370 25022 09519 09551 55120 10052 77999
2022-03-01 13:50Z 303239683 FTI01 PPDD 51128 96749 95679 07534 08524 08502 96034 29513 25513 21002 9656/ 13012 08009 97012 10526
2022-03-01 14:55Z 303242014 FTI01 AAXX 01154 96749 21550 72305 10249 20230 30096 40110 53012 70522 83412   333 56000 69927 83620
2022-03-01 17:53Z 303247548 FTI01 AAXX 01184 96749 11550 72303 10247 20230 30091 40105 58005 69921 70522 83412   333 56000 83620
2022-03-01 18:08Z 303248366 FTI01 PPAA 51181 96749 NIL=
```

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Kode

12.3.9 Group 6RRRt_R

This group shall be included in main and intermediate synoptic reports if precipitation has occurred since the previous main synoptic observation. (See para. 12.3.1.1 on the use of the symbol i_R.)

12.3.9.16 – Indicator figure of the group.

12.3.9.2RRR – Amount of precipitation which has fallen during the period preceding the time of observation, as indicated by t_R. Amounts are usually for a six hour period at the main synoptic observation and a three hour period at the intermediate observation. Six hour amounts shall be obtained from Column 12; three hour amounts shall be obtained from an intermediate reading of the standard rain gauge (see para. 12.4.8.2). Precipitation amounts are coded according to the following table.

WMO Code 3590

Amount mm	Code figure RRR	Amount mm	Code figure RRR
Trace	990	0 (not used)	000
0.1 (not used in Canada)	991	1	001
0.2	992	2	002
0.3	993	.	.
0.4	994	.	.
0.5	995	.	.
0.6	996	.	.
0.7	997	.	.
0.8	998	988	988
0.9	999	989 or more	989

Note: Precipitation amounts which are greater than 1.0 mm shall be rounded to the nearest whole millimetre prior to coding. If the precipitation amount is zero, then the 6–group is omitted.

Kode

12.3.9.3 WMO Code 4019

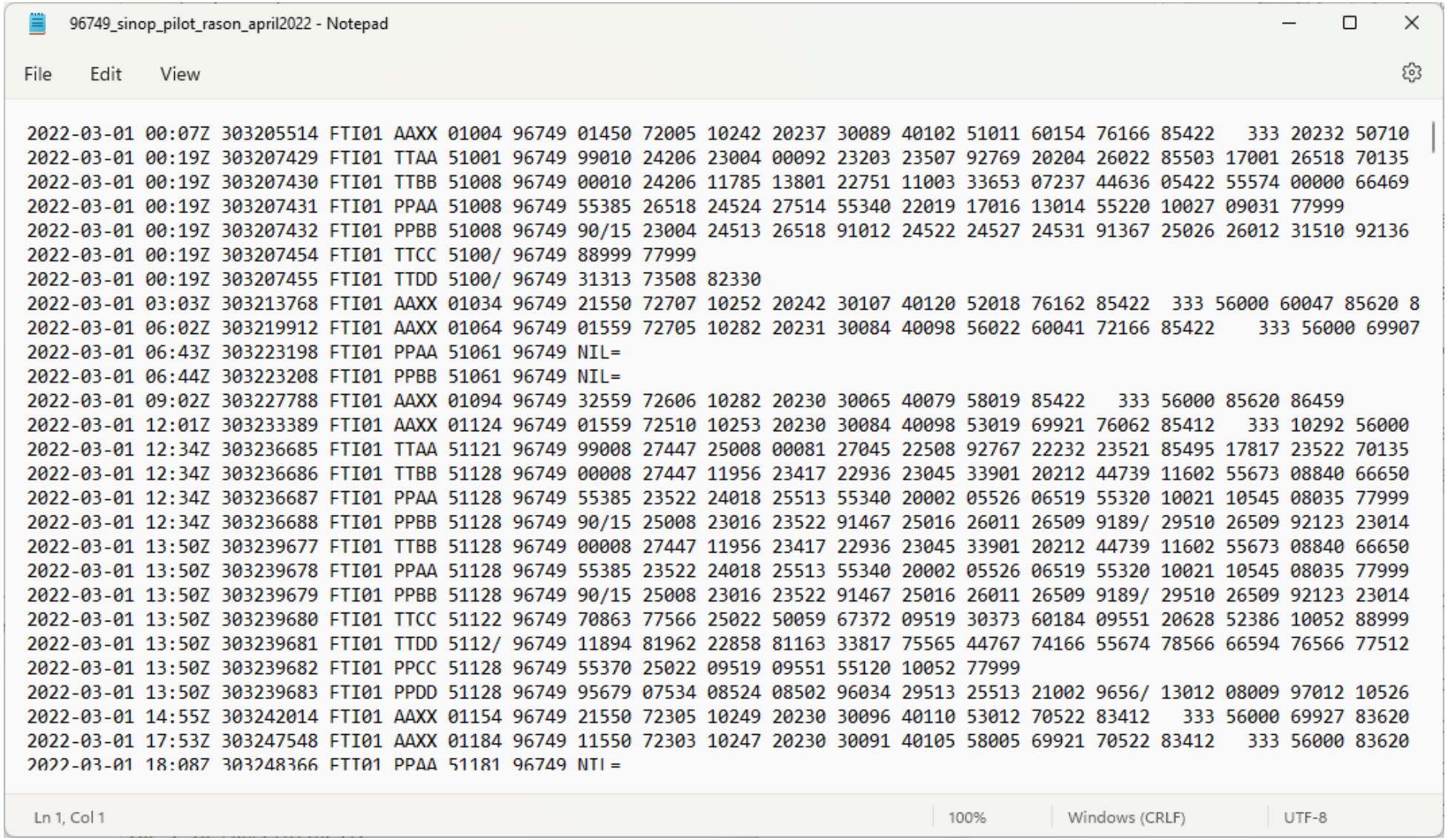
Code Figure	t_R – Duration of period of reference for amount of precipitation (RRR), ending at the time of report
1	Total precipitation during the 6 hours preceding the observation
2	Total precipitation during the 12 hours preceding the observation
3	Total precipitation during the 18 hours preceding the observation
4	Total precipitation during the 24 hours preceding the observation
5	Total precipitation during the 1 hour preceding the observation
6	Total precipitation during the 2 hours preceding the observation
7	Total precipitation during the 3 hours preceding the observation
8	Total precipitation during the 9 hours preceding the observation
9	Total precipitation during the 15 hours preceding the observation

At stations where main synoptic observations and precipitation measurements are made every six hours, t_R shall be coded as 1. At stations where fewer than four main synoptic observations are made daily, code figures 2 to 4 may be used for t_R. At stations where intermediate synoptic observations are taken and transmitted, the 6–group shall be included, using code figures 5 to 9 for t_R. If there has been no precipitation, the 6–group, including t_R, is omitted.

Library yang dibutuhkan

- Numpy
  - Split : memisahkan string
  - Find : mencari string
  - Append : menambahkan array

Data synop


96749_sinop_pilot_rason_april2022 - Notepad
File Edit View
2022-03-01 00:07Z 303205514 FTI01 AAXX 01004 96749 01450 72005 10242 20237 30089 40102 51011 60154 76166 85422 333 20232 50710
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2022-03-01 13:50Z 303239681 FTI01 TTDD 5112/ 96749 11894 81962 22858 81163 33817 75565 44767 74166 55674 78566 66594 76566 77512
2022-03-01 13:50Z 303239682 FTI01 PPCC 51128 96749 55370 25022 09519 09551 55120 10052 77999
2022-03-01 13:50Z 303239683 FTI01 PPDD 51128 96749 95679 07534 08524 08502 96034 29513 25513 21002 9656/ 13012 08009 97012 10526
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2022-03-01 18:08Z 303248366 FTI01 PPAA 51181 96749 NIL=
Ln 1, Col 1
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Windows (CRLF)
UTF-8

Prosedur dan Langkah kerja

- Looping (untuk mengulang pekerjaan yang sama)
- If else (untuk memilih kondisi yang sesuai dengan keinginan)

Contoh script

```
import numpy as np

fname='96749_sinop_pilot_rason_april2022.txt'
fid=open(fname)
lines=fid.readlines()

nlines=len(lines)

data=[]
for i in range(nlines):
    x = lines[i].split(' ')
    if x[4]=='AAXX':
        for j in range(len(x)):
            if x[j].find('01')==0 and x[j].find('4')==4:
                jj=j
            if x[j].find('6')==0 and x[j].find('7')==4:
                data1=[]
                data1.append(x[0])
                data1.append(x[jj][2:4])
                if x[j][1:3]=='99':
                    data1.append(int(x[j][3])/10)
                else:
                    data1.append(int(x[j][1:4]))
                data.append(np.array(data1))
data=np.array(data)
print(data)
```

Proses looping

Panggil library

File yang mau dibaca

Baca file

Baca semua baris

Hitung baris

Variabel baru

Data yang berhasil dibaca

Menampilkan data

Bonus

- Menyimpan hasil ke dalam excel

```
import pandas as pd

df = pd.DataFrame(data,columns=['tgl','waktu','curah hujan (mm)'])
df.to_excel("output.xlsx")
```

Tugas

- Coba ekstrak data suhu dan tekanan udara!

Terimakasih

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- Pusat Penelitian dan Pengembangan
- Badan Meteorologi Klimatologi dan Geofisika (BMKG)