paper05 data aggregation

October 10, 2021

1 Data Aggregation Across Data Sources

We have 3 different sources of data:

- 1. Our sensor data: that has the Indoor Air Quality and Indoor Environmental Data.
- 2. SINAICA: Outdoor Air Quality Monitoring Data from the Government.
- 3. OpenWeatherData: Outdoor Environmental Data.

We need it to be available that data to the models we plan to train. In the following sections this process is detailed.

 $/home/jaa6766/.conda/envs/cuda/lib/python 3.7/importlib/_bootstrap.py: 219: \\$

RuntimeWarning: numpy.ufunc size changed, may indicate binary incompatibility.

Expected 192 from C header, got 216 from PyObject

/home/jaa6766/.conda/envs/cuda/lib/python3.7/importlib/_bootstrap.py:219:

RuntimeWarning: numpy.ufunc size changed, may indicate binary incompatibility.

Expected 192 from C header, got 216 from PyObject

/home/jaa6766/.conda/envs/cuda/lib/python3.7/importlib/_bootstrap.py:219:

RuntimeWarning: numpy.ufunc size changed, may indicate binary incompatibility.

Expected 192 from C header, got 216 from PyObject

/home/jaa6766/.conda/envs/cuda/lib/python3.7/importlib/_bootstrap.py:219:

RuntimeWarning: numpy.ufunc size changed, may indicate binary incompatibility.

Expected 192 from C header, got 216 from PyObject

Default Values:

- pandas $max_columns=20$
- pandas max rows=60

New Values:

- pandas max_columns=35
- pandas max rows=60

1.1 Indoor Data

	temperature	pressure	humidity	gasResistance	\
datetime					
2021-02-12 06:04:09.089621067	21.54	777.41	43.93	151328	
2021-02-12 06:04:12.087778807	21.56	777.41	43.89	152702	
2021-02-12 06:04:15.072475433	21.53	777.41	43.97	151328	
2021-02-12 06:04:18.070170164	21.51	777.41	44.03	151464	
2021-02-12 06:04:21.061994791	21.51	777.41	44.05	152425	
	•••			•••	
2021-09-18 01:20:38.889113188	25.84	782.96	56.64	928867	
2021-09-18 01:20:41.882042885	25.83	782.94	56.66	923130	
2021-09-18 01:20:44.877856970	25.83	782.94	56.63	925034	
2021-09-18 01:20:47.872255564	25.83	782.94	56.62	923130	
2021-09-18 01:20:50.866486311	25.83	782.96	56.63	925034	
	IAQ iaqAc	curacy yea	ar month	day hour \	
datetime					
2021-02-12 06:04:09.089621067	37.5	1 202	21 2	12 6	

2021-02-12	06:04:12.087778807	35.6	1	2021	2	12	6
2021-02-12	06:04:15.072475433	37.5	1	2021	2	12	6
2021-02-12	06:04:18.070170164	38.5	1	2021	2	12	6
2021-02-12	06:04:21.061994791	36.9	1	2021	2	12	6
		•••					
2021-09-18	01:20:38.889113188	130.8	1	2021	9	18	1
2021-09-18	01:20:41.882042885	131.5	1	2021	9	18	1
2021-09-18	01:20:44.877856970	131.3	1	2021	9	18	1
2021-09-18	01:20:47.872255564	131.9	1	2021	9	18	1
2021-09-18	01:20:50.866486311	131.6	1	2021	9	18	1

minute second ${\tt datetime}$ 2021-02-12 06:04:09.089621067 4 9 2021-02-12 06:04:12.087778807 4 12 2021-02-12 06:04:15.072475433 4 15 2021-02-12 06:04:18.070170164 4 18 2021-02-12 06:04:21.061994791 4 21 2021-09-18 01:20:38.889113188 20 38 2021-09-18 01:20:41.882042885 20 41 20 44 2021-09-18 01:20:44.877856970 2021-09-18 01:20:47.872255564 20 47 2021-09-18 01:20:50.866486311 20 50

[6285103 rows x 12 columns]

1.2 Outdoor Air Quality Data

	NO	CO	NO2	NOx		03	\	
Fecha								
2021-01-01 00:00:00	0.006000	1.000000	0.032000	0.036000	0.00	6000		
2021-01-01 01:00:00	0.021000	NaN	NaN	NaN		NaN		
2021-01-01 02:00:00	0.013000	1.100000	0.032000	0.039000	0.00	4000		
2021-01-01 03:00:00	0.031000	1.200000	0.033000	0.043000	0.00	1000		
2021-01-01 04:00:00	0.005000	1.200000	0.031000	0.039000	0.00	2000		
•••	•••							
2021-10-04 00:00:00	0.008292	0.545833	0.019083	0.026875	0.01	5833		
2021-10-05 00:00:00	0.010000	0.563158	0.019722	0.030500	0.01	2278		
2021-10-06 00:00:00	0.007571	0.672222	0.026111	0.035611	0.01	1000		
2021-10-07 00:00:00	0.011565	0.713636	0.028636	0.040318	0.01	7909		
2021-10-08 00:00:00	0.023778	0.758824	0.029412	0.050588	0.01	7941		
	PM10	PM2.	5 SO	2 year 1	month	day	hour	\
Fecha	PM10	PM2.	5 SO	2 year 1	month	day	hour	\
Fecha 2021-01-01 00:00:00	PM10 31.000000	PM2.		J	month 1	day 1	hour 0	\
			0.00300	0 2021		J		\
2021-01-01 00:00:00	31.000000	19.00000	0 0.00300 N Na	0 2021 N 2021	1	1	0	\
2021-01-01 00:00:00 2021-01-01 01:00:00	31.000000 NaN	19.00000 Nal	0.00300 N Na 0 0.00300	0 2021 N 2021 O 2021	1	1 1	0 1	\
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2021-01-01 00:00:00 2021-01-01 01:00:00 2021-01-01 02:00:00 2021-01-01 03:00:00	31.000000 NaN 37.000000 49.000000 80.000000	19.000000 Nal 24.000000	0 0.00300 N Na 0 0.00300 0 0.00300	0 2021 N 2021 0 2021 0 2021	1 1 1	1 1 1 1	0 1 2 3	\
2021-01-01 00:00:00 2021-01-01 01:00:00 2021-01-01 02:00:00 2021-01-01 03:00:00	31.000000 NaN 37.000000 49.000000	19.000000 Nal 24.000000 39.000000 65.000000	0 0.00300 N Na 0 0.00300 0 0.00300 0 0.00300 	0 2021 N 2021 0 2021 0 2021 0 2021	1 1 1	1 1 1 1	0 1 2 3	\
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2021-01-01 00:00:00 2021-01-01 01:00:00 2021-01-01 02:00:00 2021-01-01 03:00:00 2021-01-01 04:00:00 	31.000000 NaN 37.000000 49.000000 80.000000	19.000000 Nal 24.000000 39.000000 65.000000	0 0.00300 N Na 0 0.00300 0 0.00300 0 0.00300 3 0.00075 7 0.00055	0 2021 N 2021 0 2021 0 2021 0 2021 0 2021 6 2021	1 1 1 1	1 1 1 1	0 1 2 3 4	\
2021-01-01 00:00:00 2021-01-01 01:00:00 2021-01-01 02:00:00 2021-01-01 03:00:00 2021-01-01 04:00:00 2021-10-04 00:00:00 2021-10-05 00:00:00 2021-10-06 00:00:00	31.000000 NaN 37.000000 49.000000 80.000000 11.826087 11.090909 18.722222	19.000000 Nal 24.000000 39.000000 65.000000 7.913043 6.772722 11.833333	0 0.00300 N Na 0 0.00300 0 0.00300 0 0.00300 3 0.00075 7 0.00055 3 0.00011	0 2021 N 2021 0 2021 0 2021 0 2021 0 2021 6 2021 1 2021	1 1 1 1 1 10 10	1 1 1 1 1 1 4 5 6	0 1 2 3 4 0 0	\
2021-01-01 00:00:00 2021-01-01 01:00:00 2021-01-01 02:00:00 2021-01-01 03:00:00 2021-01-01 04:00:00 2021-10-04 00:00:00 2021-10-05 00:00:00	31.000000 NaN 37.000000 49.000000 80.000000 11.826087 11.090909	19.000000 Nal 24.000000 39.000000 65.000000 7.913040 6.77272	0 0.00300 N Na 0 0.00300 0 0.00300 0 0.00300 3 0.00075 7 0.00055 3 0.00011 0 0.00104	0 2021 N 2021 0 2021 0 2021 0 2021 0 2021 6 2021 1 2021 5 2021	1 1 1 1 1 10	1 1 1 1 1 1 4 5	0 1 2 3 4	\

minute

Fecha

2021-01-01	00:00:00		0
2021-01-01	01:00:00		0
2021-01-01	02:00:00		0
2021-01-01	03:00:00		0
2021-01-01	04:00:00		0
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2021-10-04	00:00:00		0
			_
2021-10-05	00:00:00		0
2021-10-05 2021-10-06			0
	00:00:00		•
2021-10-06	00:00:00 00:00:00		0

[2352 rows x 13 columns]

1.3 Outdoor Weather Data

	temperature	feels_like	pressure	humidity	wind_speed	\
dt						
2021-02-12 07:00:00	13.87	12.46	1020	44	0.00	
2021-02-12 08:00:00	12.81	11.37	1020	47	0.00	
2021-02-12 09:00:00	10.83	9.35	1019	53	1.54	
2021-02-12 10:00:00	6.40	3.51	1019	61	4.12	
2021-02-12 11:00:00	6.23	6.23	1019	57	0.00	
	•••	•••		•••		
2021-09-27 19:00:00	21.51	20.89	1006	45	0.89	
2021-09-27 20:00:00	23.18	22.81	1005	48	0.45	
2021-09-27 21:00:00	22.21	21.69	1025	46	6.17	
2021-09-27 22:00:00	21.03	20.68	1004	57	0.45	
2021-09-27 23:00:00	20.17	19.81	1004	60	5.66	
	wind_deg wea	ther_main				
dt						
2021-02-12 07:00:00	0	Clear				
2021-02-12 08:00:00	0	Clear				
2021-02-12 09:00:00	60	Clear				
2021-02-12 10:00:00	40	Clear				
2021-02-12 11:00:00	0	Clear				
•••						
2021-09-27 19:00:00	139	Clear				
2021-09-27 20:00:00	224	Rain				
2021-09-27 21:00:00	220	Rain				
2021-09-27 22:00:00	242	Rain				
2021-09-27 23:00:00	140	Clouds				

[5601 rows x 7 columns]

1.4 Merging the 3 Datasets: Indoor Data, Outdoor Air Quality Data, Outdoor Weather Data.

1.4.1 Merging Air Quality and Weather Data

	NO	CO	NO2	NOx	03	\
2021-02-12 07:00:00	0.244000	2.500000	0.035000	0.205000	0.002000	
2021-02-12 08:00:00	0.146000	1.600000	0.030000	0.089000	0.004000	
2021-02-12 09:00:00	0.099000	1.500000	0.039000	0.072000	0.012000	
2021-02-12 10:00:00	0.024000	1.200000	0.030000	0.047000	0.025000	
2021-02-12 11:00:00	0.009000	0.900000	0.016000	0.026000	0.033000	
•••	•••	•••		***		
2021-09-14 00:00:00	0.017000	0.716667	0.015125	0.024625	0.013333	

2021-09-15 00:	00:00 0.027458	0.954167	0.028167	0.048625 0	.019375	
2021-09-16 00:					.022792	
2021-09-17 00:					.026650	
2021-09-18 00:					.015304	
2021 03 10 00.	00.00 0.003174	0.703217	0.027020	0.003040	.010004	
	PM1C	PM2.5	S02	temperatu	re feels_like '	\
2021-02-12 07:				_	_	`
2021-02-12 07:						
2021-02-12 09:						
2021-02-12 10:						
2021-02-12 11:	00:00 33.000000	19.000000	0.001000	6.2	23 6.23	
2021-09-14 00:		4.500000				
2021-09-15 00:						
2021-09-16 00:						
2021-09-17 00:	00:00 29.666667	24.875000	0.003350	18.3	17.69	
2021-09-18 00:	00:00 20.304348	16.391304	0.001304	17.6	31 17.85	
	pressure	humidity	wind_speed	wind_deg v	weather_main	
2021-02-12 07:	00:00 1020.0	44.0	0.00	0.0	Clear	
2021-02-12 08:	00:00 1020.0	47.0	0.00	0.0	Clear	
2021-02-12 09:	00:00 1019.0	53.0	1.54	60.0	Clear	
2021-02-12 10:	00:00 1019.0	61.0	4.12	40.0	Clear	
2021-02-12 11:		57.0	0.00		Clear	
					01001	
2021-09-14 00:		 56.0	4.12		Rain	
2021-09-15 00:		49.0	7.72		Clouds	
2021-09-16 00:		49.0	6.17		Smoke	
2021-09-17 00:		56.0	4.63		Rain	
2021-09-18 00:		93.0	1.37		Rain	
2021-09-10 00.	00.00 1015.0	93.0	1.37	199.0	naili	
[12/1 1	[]					
[1341 rows x 1	5 COLUMNS					
			***		71110 \	
	NO CO		NOx	03	PM10 \	
	006875 0.883333		0.034458		16.833333	
	010250 0.947619		0.042750		29.666667	
2021-09-18 0.	009174 0.765217	0.027826	0.039043	0.015304	20.304348	
	PM2.5 SC	2 temperat			sure humidity '	\
2021-09-16 40	.041667 0.00154	2 18	.45	17.63 102	22.0 49.0	
2021-09-17 24	.875000 0.00335	50 18	.34	17.69 102	24.0 56.0	
2021-09-18 16	3.391304 0.00130	17	.61	17.85 101	15.0 93.0	
wi	nd_speed wind_d	leg weather_	main			
2021-09-16	6.17 130	_	moke			
2021-09-17	4.63 300	0.0	Rain			
2021-09-18	1.37 199		Rain			

1.4.2 Merging Indoor and Outdoor (Air Quality and Weather) Data

	tem	perature	pressure	humidity	${\tt gasResistance}$	\
datetime						
2021-09-16 23:59:42.	445474625	25.86	780.44	57.00	877365	
2021-09-16 23:59:45.	439809322	25.85	780.40	57.04	874512	
2021-09-16 23:59:48.	434415102	25.85	780.42	57.07	877365	
2021-09-16 23:59:51.	428925753	25.84	780.42	57.07	872810	
2021-09-16 23:59:54.	423571348	25.84	780.42	57.07	872244	
2021-09-16 23:59:57.	418201685	25.84	780.44	57.06	868302	
2021-09-17 00:00:00.	412962675	25.84	780.42	57.02	869987	

2021-09-17 00:00:03.407538652 2021-09-17 00:00:06.402314186 2021-09-17 00:00:09.396840096	25	5.83	780. 780. 780.	42	57.02 57.05 57.00		868	365 302 651	
	IAQ	iaqAccura	асу	year	month	day	hour	\	
datetime	046.4			0004	0	4.0	00		
2021-09-16 23:59:42.445474625	246.4		1	2021	9	16			
2021-09-16 23:59:45.439809322	246.7		1	2021	9	16			
2021-09-16 23:59:48.434415102	245.9		1	2021	9	16			
2021-09-16 23:59:51.428925753	246.9		1	2021	9	16			
2021-09-16 23:59:54.423571348 2021-09-16 23:59:57.418201685	247.7		1	2021 2021	9	16			
	249.6		1		9	16			
2021-09-17 00:00:00.412962675	250.0		1	2021	9	17			
2021-09-17 00:00:03.407538652 2021-09-17 00:00:06.402314186	248.1 249.8		1 1	2021 2021	9	17 17			
2021-09-17 00:00:06.402314186	249.6		1	2021	9	17			
2021-09-17 00:00:09.396640096	240.0		1	2021	Э	17	U		
1-4-4-2	minute	second		NO	C	:0	NO2	\	
datetime	ΕO	40		N o N	Ma	M	MaM		
2021-09-16 23:59:42.445474625 2021-09-16 23:59:45.439809322	59 59	42 45		NaN NaN	Na Na		NaN NaN		
2021-09-16 23:59:45.459609322	59 59	45 48			Na Na		NaN		
2021-09-16 23:59:40.434415102	59 59	40 51		NaN NaN	Na Na		NaN		
2021-09-16 23:59:51.426925755	59 59	51 54		NaN	Na Na		NaN		
2021-09-16 23:59:54.423571346	59 59	54 57		NaN	Na Na		NaN		
2021-09-10 23.39.37.418201883	0	0	0 0	1025	0.94761		.0327		
2021-09-17 00:00:03.407538652	0	3	0.0	NaN	Na		NaN		
2021-09-17 00:00:06.402314186	0	6		NaN	Na		NaN		
2021-09-17 00:00:09.396840096	0	9		NaN	Na		NaN		
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2021-09-16 23:59:48.434415102	NaN	Nal				NaN	Na		
2021-09-16 23:59:51.428925753	NaN	Nal				NaN	Na		
2021-09-16 23:59:54.423571348	NaN	Nal				NaN	Na		
2021-09-16 23:59:57.418201685	NaN	Nal				NaN	Na		
2021-09-17 00:00:00.412962675	0.04275	0.0266		9.6666		875	0.0033		
2021-09-17 00:00:03.407538652	NaN	Nal	N	N	laN	NaN	Na		
2021-09-17 00:00:06.402314186	NaN	Nal	N	N	laN	NaN	Na		
2021-09-17 00:00:09.396840096	NaN	Nal	N	N	JaN	NaN	Na	.N	
	temperat	ture_outo	door	feel	s_like	\			
datetime	1	_ `			_				
2021-09-16 23:59:42.445474625			NaN	ſ	NaN				
2021-09-16 23:59:45.439809322			NaN	ſ	NaN				
2021-09-16 23:59:48.434415102			NaN	ſ	NaN				
2021-09-16 23:59:51.428925753			NaN	ſ	NaN				
2021-09-16 23:59:54.423571348			NaN	ſ	NaN				
2021-09-16 23:59:57.418201685			NaN	ſ	NaN				
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2021-09-17 00:00:03.407538652			NaN	ſ	NaN				
2021-09-17 00:00:06.402314186			NaN	Ī	NaN				
2021-09-17 00:00:09.396840096			NaN	Ī	NaN				
	pressure	e_outdooi	r h	umidit	y_outdo	or	wind_sp	eed	\
datetime	-	_					_ 1		-

2021-09-16 23:59:45.439809322	NaN	NaN	NaN
2021-09-16 23:59:48.434415102	NaN	NaN	NaN
2021-09-16 23:59:51.428925753	NaN	NaN	NaN
2021-09-16 23:59:54.423571348	NaN	NaN	NaN
2021-09-16 23:59:57.418201685	NaN	NaN	NaN
2021-09-17 00:00:00.412962675	1024.0	56.0	4.63
2021-09-17 00:00:03.407538652	NaN	NaN	NaN
2021-09-17 00:00:06.402314186	NaN	NaN	NaN
2021-09-17 00:00:09.396840096	NaN	NaN	NaN
	wind_deg weather_main		
datetime			

datetime			
2021-09-16	23:59:42.445474625	NaN	NaN
2021-09-16	23:59:45.439809322	NaN	NaN
2021-09-16	23:59:48.434415102	NaN	NaN
2021-09-16	23:59:51.428925753	NaN	NaN
2021-09-16	23:59:54.423571348	NaN	NaN
2021-09-16	23:59:57.418201685	NaN	NaN
2021-09-17	00:00:00.412962675	300.0	Rain
2021-09-17	00:00:03.407538652	NaN	NaN
2021-09-17	00:00:06.402314186	NaN	NaN
2021-09-17	00:00:09.396840096	NaN	NaN

Dataset with Indoor and Outdoor Data: * 6285103 Rows * 27 Columns.

	temperat	ture	press	ure h	umidity	gasF	desistan	ce	\
datetime									
2021-02-12 07:00:02.979657173	21	1.51	777	.30	43.74		1445	61	
2021-02-12 08:00:01.982832432	21	1.04	776	.92	42.35		1535	39	
2021-02-12 09:00:00.729691744	20	0.41	776	.33	42.56		1538	20	
2021-02-12 10:00:02.449775934	20	0.27	776	.20	42.21		1440	66	
2021-02-12 11:00:01.044736862	19	9.91	776	. 25	42.26		1421	17	
•••			•••						
2021-09-14 00:00:02.855808020	24	1.31	780	.42	55.46		8739	44	
2021-09-15 00:00:01.543255568	25	5.52	779	.38	54.92		9385	90	
2021-09-16 00:00:01.135869265	27	7.09	778	.30	48.41		12227	27	
2021-09-17 00:00:00.412962675	25	5.84	780	.42	57.02		8699	87	
2021-09-18 00:00:02.824432135	26	3.37	782	.04	54.60		9505	30	
	IAQ i	iadAcc	uracy	year	month	day	hour	\	
datetime	1114 -	raqiioo	Jaraoj	your	monon	aaj	nour	`	
2021-02-12 07:00:02.979657173	95.2		1	2021	2	12	7		
2021-02-12 08:00:01.982832432	78.3		1	2021	2	12	8		
2021-02-12 09:00:00.729691744	99.0		1		2	12	9		
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2021-09-18	00:00:02.824432135	199.0	Rain

[1186 rows x 27 columns]

1.5 **Imputations**

We found that the resulting dataframe after merging 2 datasets (Outdoor Data that is sampled every 1 hour and Indoor Data that is sampled every 3 seconds) contains repeated records on the columns of hourly data: SINAICA Gov't Air Quality Monitoring and OpenWeatherData.

We think that the repeated data can be an issue, as the data moves very abruptly from a record call it at 10:57 and 11:00. This is relevant as the real world is not represented by the data correctly. Temperature, pressure and general natural features move slowly from one value to other. But we don't have that data, and it's not easily obtainable.

Therefore, we propose an approach similar to the imputations using the interpolation incorporating noise, that could avert the overfitting issue on our machine learning and deep learning training.

CPU times: user 999 ms, sys: 176 ms, total: 1.18 s Wall time: 1.17 s /home/jaa6766/.conda/envs/cuda/lib/python3.7/sitepackages/ipykernel_launcher.py:4: SettingWithCopyWarning: A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandasdocs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy

CPU times: user 1.9 s, sys: 1.09 s, total: 2.99 s

Wall time: 2.99 s

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[6285103 rows x 27 columns]

Here we can see the first and last data points to create the interpolation for the first and last values:

CPU times: user 340 ms, sys: 293 ms, total: 633 ms

Wall time: 632 ms

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2021-09-18 01:20:41.882042885		NaN		NaN	NaN	
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2021-09-18 01:20:50.866486311	1	1018.0	8	89.0	2.11	
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[6285103 rows x 27 columns]						
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	temperature	pressure	humidity	gasResist	ance	\
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2021-02-12 06:04:12.087778807	21.56	777.41	43.89	15	2702	

2021-02-12 06:04:15.072475433	21.	53	777.	41	43.97		1513	328
2021-02-12 06:04:18.070170164	21.	51	777.	41	44.03		1514	464
2021-02-12 06:04:21.061994791	21.	51	777.	41	44.05		1524	425
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2021-02-12 09:04:38.933268309	20.	65	776.	29	42.03		152	564
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2021-02-12 09:04:50.899550915	20.		776.		42.12		1510	
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2021-02-12 06:04:09.089621067	37.5		1	2021	2	12	6	
2021-02-12 06:04:12.087778807	35.6		1	2021	2	12	6	
2021-02-12 06:04:15.072475433	37.5		1	2021	2	12		
2021-02-12 06:04:18.070170164	38.5		1	2021	2	12		
2021-02-12 06:04:21.061994791	36.9		1	2021	2	12	6	
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2021-02-12 09:04:38.933268309	107.7		1	2021	2	12	9	
2021-02-12 09:04:41.924828053	107.9		1	2021	2	12		
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2021-02-12 09:04:47.907913446	110.7		1	2021	2	12	9	
2021-02-12 09:04:50.899550915	111.5		1	2021	2	12	9	
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2021-02-12 06:04:18.070170164	4	18		05107	2.2008		0.03100	
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2021 02 12 00.04.21.001334731		21					0.001010	,
2021-02-12 09:04:38.933268309	4	38		93207	1.4768		0.03830	5
2021-02-12 09:04:41.924828053	4	41		93145	1.476		0.03829	
2021-02-12 09:04:44.916538477	4	44		93082	1.4763		0.03829	
2021-02-12 09:04:47.907913446	4	47		93020	1.4760		0.03828	
2021-02-12 09:04:50.899550915	4	50		92958	1.4758		0.03827	
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2021-02-12 06:04:09.089621067	0.207000	0.002	2000	45.00	0000	22.00	0000	
2021-02-12 06:04:12.087778807	0.206998	0.002	2000	45.01	0949	22.00	2737	
2021-02-12 06:04:15.072475433	0.206996	0.002	2000	45.02	1898	22.00	5474	
2021-02-12 06:04:18.070170164	0.206995	0.002	2000	45.03	2847	22.00	8212	
2021-02-12 06:04:21.061994791	0.206993	0.002		45.04		22.01		
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2021-02-12 09:04:38.933268309	0.070069	0.013	3004	49.22	7575	27.45	9302	
2021-02-12 09:04:41.924828053	0.070048	0.013		49.21		27.45		
2021-02-12 09:04:44.916538477	0.070027	0.013		49.21		27.44		
2021-02-12 09:04:47.907913446	0.070007	0.013		49.20		27.44		
2021-02-12 09:04:50.899550915	0.069986	0.013		49.19		27.43		
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2021-02-12 06:04:09.089621067	0.004000			14.93	0000	13.6	00000	
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2021-02-12 06:04:15.072475433	0.004002			14.92			97920	
2021-02-12 06:04:18.070170164	0.004003			14.92			96880	
2021-02-12 06:04:21.061994791	0.004004			14.92			95839	
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2021-02-12 09:04:38.933268309	0.002000		10.48	7816	8.89	8904		
2021-02-12 09:04:41.924828053	0.002000		10.48	4136	8.89	4053		
2021-02-12 09:04:44.916538477	0.002000		10.48	0457	8.88	9203		
2021-02-12 09:04:47.907913446	0.002000		10.47	6777	8.88	4352		
2021-02-12 09:04:50.899550915	0.002000		10.47	3098	8.87	9502		
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2021-02-12 06:04:15.072475433	1020.99	98175		43.0018	25	2.565	310	
2021-02-12 06:04:18.070170164	1020.99	97263		43.0027	37	2.562	965	
2021-02-12 06:04:21.061994791	1020.99	96350		43.0036	50	2.560	620	
					4.0		000	
2021-02-12 09:04:38.933268309	1019.00			53.6179		1.739		
2021-02-12 09:04:41.924828053 2021-02-12 09:04:44.916538477	1019.00 1019.00			53.6245 53.6312		1.743		
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2021-02-12 09:04:47.907913440	1019.00			53.6445		1.745		
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2021-02-12 06:04:09.089621067	110.000000		Clear					
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2021-02-12 06:04:15.072475433	109.799270		Clear					
2021-02-12 06:04:18.070170164	109.698905		Clear					
2021-02-12 06:04:21.061994791	109.598540	C	Clear					
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2021-02-12 09:04:41.924828053	58.438538	C	Clear					
2021-02-12 09:04:44.916538477	58.421927	C	Clear					
2021-02-12 09:04:47.907913446	58.405316	C	Clear					
2021-02-12 09:04:50.899550915	58.388704	C	Clear					
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2021-09-17 22:21:10:524403043	27.02			49.70		1044		
2021-09-17 22:21:22.514595508	27.02			49.69		1042		
2021-09-17 22:21:25.509442091	27.01	780.		49.68		1047		
2021-09-18 01:20:38.889113188	25.84	782.	96	56.64		928	867	
2021-09-18 01:20:41.882042885	25.83			56.66		923	130	
2021-09-18 01:20:44.877856970	25.83			56.63			034	
2021-09-18 01:20:47.872255564	25.83			56.62			130	
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2021-09-17 22:21:13.529673576	32.3	1		9	17	22		
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2021-09-17 22:21:19.519613981	33.4	1		9	17	22		
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2021-09-17 22:21:25.509442091	34.7	1		9	17	22		
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2021-09-18 01:20:41.882042885 2021-09-18 01:20:44.877856970 2021-09-18 01:20:47.872255564	0.039043 0.039043	0.015304 0.015304 0.015304 0.015304	20.304348 20.304348 20.304348	16.391 16.391 16.391	304 304	
2021-09-18 01:20:50.866486311		0.015304	20.304348	16.391		
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2021-09-17 22:21:13.529673576 2021-09-17 22:21:16.524485349 2021-09-17 22:21:19.519613981 2021-09-17 22:21:22.514595508 2021-09-17 22:21:25.509442091 	0.001445 0.001445 0.001445 0.001444 0.001444		17.660085 17.660060 17.660034 17.660009 17.659984	17.83 17.83 17.83 17.83 17.83	9028 9034 9039 9045	
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[3600 rows x 27 columns]

CPU times: user 20.7 s, sys: 11.3 s, total: 32.1 s

Wall time: 32 s

1.6 Resampling

To reduce training time we propose to have a resampling of the data.

In the following subsections we create those resampled-data dataframes.

1.6.1 1 Minute Resampling

CPU times: user 6.83 s, sys: 605 ms, total: 7.44 s

Wall time: 7.43 s

	tomporaturo	progguro	humidity	gasResist	ance \
datetime	temperature	pressure	Humiaicy	gasitesist	cance (
2021-02-12 06:04:00	21.530000	777.410000	43.974000	151849.40	0000
2021-02-12 06:04:00	21.526250	777.410000	43.840000	152790.00	
2021-02-12 06:05:00	21.693000			152790.00	
		777.409000	43.426000		
2021-02-12 06:07:00	21.759000	777.410500	43.245500	151978.45	
2021-02-12 06:08:00	21.750500	777.390500	43.056000	150300.40	00000
					-0000
2021-09-18 01:16:00	25.871000	782.805000	56.607000	921467.05	
2021-09-18 01:17:00	25.861000	782.832000	56.587500	921211.60	
2021-09-18 01:18:00	25.850000	782.866000	56.597500	922348.70	
2021-09-18 01:19:00	25.836190	782.900000	56.683810	921997.09	
2021-09-18 01:20:00	25.836471	782.932941	56.662941	922768.88	32353
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datetime					
2021-02-12 06:04:00	37.200000	1.0	2021.0	2.0 12.0	6.0
2021-02-12 06:05:00	32.162500	1.0	2021.0	2.0 12.0	6.0
2021-02-12 06:06:00	34.325000	1.0	2021.0	2.0 12.0	6.0
2021-02-12 06:07:00	36.190000	1.0	2021.0	2.0 12.0	6.0
2021-02-12 06:08:00	46.600000	1.0	2021.0	2.0 12.0	6.0
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2021-09-18 01:16:00	133.940000	1.0	2021.0	9.0 18.0	1.0
2021-09-18 01:17:00	134.815000	1.0	2021.0	9.0 18.0	1.0
2021-09-18 01:18:00	133.850000	1.0	2021.0	9.0 18.0	1.0
2021-09-18 01:19:00	134.190476	1.0	2021.0	9.0 18.0	1.0
2021-09-18 01:20:00	133.876471	1.0	2021.0	9.0 18.0	1.0
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2021-02-12 06:04:00	4.0 15.0	00000 0.205	071 2.2009	547 0.0310	007

2021-02-12 06	:05:00	5.0	45.875000	0.205302	2.202327	0.031031	
2021-02-12 06	:06:00	6.0	30.500000	0.205801	2.206159	0.031082	
2021-02-12 06	:07:00	7.0	30.500000	0.206512	2.211633	0.031155	
2021-02-12 06	:08:00	8.0	30.500000	0.207224	2.217108	0.031228	
•••							
2021-09-18 01	:16:00	16.0	28.500000	0.009174	0.765217	0.027826	
2021-09-18 01	:17:00	17.0	28.500000	0.009174	0.765217	0.027826	
2021-09-18 01	:18:00	18.0	28.500000	0.009174	0.765217	0.027826	
2021-09-18 01	:19:00	19.0	29.619048	0.009174	0.765217	0.027826	
2021-09-18 01	:20:00	20.0	26.000000	0.009174	0.765217	0.027826	
		NOx	03	PM1	O PM2	2.5	302 \
datetime							
2021-02-12 06		0.206996		45.02189			
2021-02-12 06		0.206984		45.09306			
2021-02-12 06		0.206959		45.24635			
2021-02-12 06		0.206922		45.46532			
2021-02-12 06	:08:00	0.206886	0.002000	45.68430	7 22.1710	0.0040	057
	40.00						204
2021-09-18 01		0.039043		20.30434			
2021-09-18 01		0.039043		20.30434			
2021-09-18 01		0.039043		20.30434			
2021-09-18 01		0.039043		20.30434			
2021-09-18 01	:20:00	0.039043	0.015304	20.30434	8 16.3913	304 0.0013	304
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2021-02-12 06	:04:00		14.928066	13.597	920	1020.99817	75
2021-02-12 06			14.921779			1020.99224	
2021-02-12 06			14.908239			1020.97947	
2021-02-12 06			14.888896			1020.96122	
2021-02-12 06			14.869553			1020.94297	
•••			•••	•••		•••	
2021-09-18 01	:16:00		14.469432		671	1017.83786	33
2021-09-18 01	:17:00		14.428419			1017.87492	23
2021-09-18 01	:18:00		14.387406	14.210	022	1017.91198	33
2021-09-18 01	:19:00		14.345368	14.162	539	1017.94996	39
2021-09-18 01	:20:00		14.306405	14.118	530	1017.98517	76
	1	humidity	_outdoor w	rind_speed	wind_d	leg	
datetime							
2021-02-12 06			3.001825	2.565310			
2021-02-12 06			3.007755	2.550068			
2021-02-12 06			3.020529	2.517240			
2021-02-12 06			3.038777	2.470342			
2021-02-12 06	:08:00	4	3.057026	2.423444	103.7271	190	
		_					
2021-09-18 01			9.216183	2.070006			
2021-09-18 01			9.166770	2.079148			
2021-09-18 01			9.117356	2.088289			
2021-09-18 01			9.066708	2.097659			
2021-09-18 01	:20:00	8	9.019765	2.106343	349.2538	OOU	

[313637 rows x 26 columns]

1.6.2 2 Minute Resampling

CPU times: user 3.18 s, sys: 141 ms, total: 3.32 s

Wall time: 3.32 s

	temperatur	e press	rura	humio	ditu mas	sResist	ance	\
datetime	temperatur	e press	sure	Humit	iity gas	ones 15 c	ance	`
2021-02-12 06:04:00	21.52769	2 777.409	9231	43.893	1538 152	2428.23	0769	
2021-02-12 06:06:00	21.72600	0 777.409	9750	43.335	5750 152	2099.50	0000	
2021-02-12 06:08:00	21.68625	777.365	5250	43.29	1500 147	7429.20	0000	
2021-02-12 06:10:00	21.49950	0 777.302	2000	43.106	3250 149	9288.47	5000	
2021-02-12 06:12:00	21.62825	50 777.279	9500	42.830	0750 149	9325.97	5000	
 2021-09-18 01:12:00	 25.91350	 00 782.776	3500	 56.513	3250 920	 0534.62	5000	
2021-09-18 01:14:00	25.89275			56.55		1024.82		
2021-09-18 01:16:00	25.86600			56.597		1339.32		
2021-09-18 01:18:00	25.84292			56.64		2168.60		
2021-09-18 01:20:00	25.83647			56.662		2768.88		
	IAC	iaqAccur	racy	year	month	day	hour	\
datetime	24 100000		1 0	0001 (10.0	<i>c</i> 0	
2021-02-12 06:04:00	34.100000		1.0	2021.0		12.0	6.0	
2021-02-12 06:06:00	35.257500		1.0	2021.0		12.0 12.0	6.0	
2021-02-12 06:08:00	72.652500		1.0	2021.0 2021.0			6.0	
2021-02-12 06:10:00	69.505000		1.0			12.0	6.0	
2021-02-12 06:12:00	71.237500	···	1.0	2021.0	2.0	12.0	6.0	
2021-09-18 01:12:00	134.397500		1.0	2021.0		18.0	1.0	
2021-09-18 01:14:00	134.380000		1.0	2021.0		18.0	1.0	
2021-09-18 01:16:00	134.377500		1.0	2021.0		18.0	1.0	
2021-09-18 01:18:00	134.024390		1.0	2021.0		18.0	1.0	
2021-09-18 01:20:00	133.876471		1.0	2021.0		18.0	1.0	
1-4-4	minute	second	i	NO	(CO	NO2	\
datetime	4 645305	24 00000		005014	0.0016	10 0 0	21000	
2021-02-12 06:04:00 2021-02-12 06:06:00	4.615385 6.500000	34.000000		205214 206156	2.20164		31022 31119	
2021-02-12 06:08:00	8.500000	30.500000		200130	2.21984		31119	
2021-02-12 06:10:00	10.500000	29.900000		209003	2.23079		31411	
2021-02-12 06:10:00	12.500000	29.500000		210427	2.24174		31557	
						10 0.0	01001	
2021-09-18 01:12:00	12.500000	28.500000	0.	009174	0.7652	17 0.0	27826	
2021-09-18 01:14:00	14.500000	28.500000	0.	009174	0.7652	17 0.0	27826	
2021-09-18 01:16:00	16.500000	28.500000	0.	009174	0.7652	17 0.0	27826	
2021-09-18 01:18:00	18.512195	29.073171	١ ٥.	009174	0.7652	17 0.0	27826	
2021-09-18 01:20:00	20.000000	26.000000	0.	009174	0.7652	17 0.0	27826	
	NOx	ПЗ		PM10	DMO	. 5	S02	\
datetime	NUX	03		FILO	FHZ	. 0	502	`
2021-02-12 06:04:00	0.206989	0.002000	45.0	65693	22.01642	23 0.0	04005	
2021-02-12 06:06:00		0.002000		55839	22.08896		04030	
2021-02-12 06:08:00		0.002000		93796	22.19844		04066	
2021-02-12 06:10:00		0.002000		31752			04103	
2021-02-12 06:12:00		0.002000			22.41742		04139	
							04001	
2021-09-18 01:12:00					16.39130		01304	
2021-09-18 01:14:00		0.015304		04348	16.39130		01304	
2021-09-18 01:16:00		0.015304			16.39130		01304	
2021-09-18 01:18:00		0.015304					01304	
2021-09-18 01:20:00	0.039043	0.015304	20.3	U4348	16.39130)4 U.C	01304	
	temperatur	e_outdoor	fee	ls_like	e pressi	ıre_out	door	\
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2021-02-12 06:04:00		14.924197	13	.593759) :	1020.99	4526	

2021-02-12	06:06:00	14.898568	3 13.56619	95 1	1020.970347
2021-02-12	06:08:00	14.859881	13.5245	89 1	1020.933850
2021-02-12	06:10:00	14.821195	13.4829	84 1	1020.897354
2021-02-12	06:12:00	14.782509	13.4413	78 1	1020.860858
•••		•••			
2021-09-18	01:12:00	14.612977	7 14.46480	09 1	017.708153
2021-09-18	01:14:00	14.530951	14.3721	59 1	017.782273
2021-09-18	01:16:00	14.448925	14.2795	09 1	017.856393
2021-09-18	01:18:00	14.365874	14.1857	01 1	1017.931439
2021-09-18	01:20:00	14.306405	14.1185	30 1	017.985176
		humidity_outdoor v	vind_speed	wind_de	eg
datetime					
2021-02-12	06:04:00	43.005474	2.555931	109.39781	10
2021-02-12	06:06:00	43.029653	2.493791	106.73813	39
2021-02-12	06:08:00	43.066150	2.399995	102.72354	10
2021-02-12	06:10:00	43.102646	2.306200	98.70894	1 2
2021-02-12	06:12:00	43.139142	2.212404	94.69434	13
•••		•••	•••		
2021-09-18	01:12:00	89.389129	2.038011	335.31037	77
2021-09-18	01:14:00	89.290303	2.056294	339.04107	7 5
2021-09-18	01:16:00	89.191476	2.074577	342.77177	' 3
2021-09-18	01:18:00	89.091414	2.093088	346.54910)4
2021-09-18	01:20:00	89.019765	2.106343	349.25386	30

[156819 rows x 26 columns]

1.6.3 3 Minute Resampling

CPU times: user 1.31 s, sys: 313 ms, total: 1.62 s

Wall time: 1.62 s

	temperature	pressure	humidity	gasI	Resist	ance	\
datetime							
2021-02-12 06:00:00	21.530000	777.410000	43.974000	1518	349.40	0000	
2021-02-12 06:05:00	21.689773	777.389432	43.361477	1500	039.40	9091	
2021-02-12 06:10:00	21.538300	777.285200	42.909800	1499	975.94	0000	
2021-02-12 06:15:00	21.563900	777.269000	42.704100	1508	397.02	0000	
2021-02-12 06:20:00	21.616931	777.223960	42.695545	1499	963.91	0891	
	•••	•••	•••				
2021-09-18 01:00:00	25.987500	782.832000	56.333000	9186	360.29	0000	
2021-09-18 01:05:00	25.966100	782.800200	56.379800	9203	302.74	0000	
2021-09-18 01:10:00	25.915100	782.782200	56.511300	9208	336.00	0000	
2021-09-18 01:15:00	25.860099	782.840594	56.613069	9215	519.30	6931	
2021-09-18 01:20:00	25.836471	782.932941	56.662941	9227	768.88	2353	
	IAQ	iaqAccuracy	year mo	onth	day	hour	\
datetime	IAQ	iaqAccuracy	year mo	onth	day	hour	\
datetime 2021-02-12 06:00:00	IAQ 37.200000	iaqAccuracy	year mc	onth 2.0	day 12.0	hour	\
	,	1	v		J		\
2021-02-12 06:00:00	37.200000	1.0	2021.0	2.0	12.0	6.0	\
2021-02-12 06:00:00 2021-02-12 06:05:00	37.200000 51.973864	1.0	2021.0 2021.0	2.0	12.0 12.0	6.0 6.0	\
2021-02-12 06:00:00 2021-02-12 06:05:00 2021-02-12 06:10:00	37.200000 51.973864 67.172000	1.0 1.0 1.0	2021.0 2021.0 2021.0	2.0 2.0 2.0	12.0 12.0 12.0	6.0 6.0 6.0	\
2021-02-12 06:00:00 2021-02-12 06:05:00 2021-02-12 06:10:00 2021-02-12 06:15:00	37.200000 51.973864 67.172000 65.798000	1.0 1.0 1.0 1.0	2021.0 2021.0 2021.0 2021.0	2.0 2.0 2.0 2.0	12.0 12.0 12.0 12.0	6.0 6.0 6.0	\
2021-02-12 06:00:00 2021-02-12 06:05:00 2021-02-12 06:10:00 2021-02-12 06:15:00	37.200000 51.973864 67.172000 65.798000	1.0 1.0 1.0 1.0	2021.0 2021.0 2021.0 2021.0 2021.0	2.0 2.0 2.0 2.0 2.0	12.0 12.0 12.0 12.0	6.0 6.0 6.0	\
2021-02-12 06:00:00 2021-02-12 06:05:00 2021-02-12 06:10:00 2021-02-12 06:15:00 2021-02-12 06:20:00 	37.200000 51.973864 67.172000 65.798000 71.275248	1.0 1.0 1.0 1.0 1.0	2021.0 2021.0 2021.0 2021.0 2021.0	2.0 2.0 2.0 2.0 2.0	12.0 12.0 12.0 12.0 12.0	6.0 6.0 6.0 6.0	\
2021-02-12 06:00:00 2021-02-12 06:05:00 2021-02-12 06:10:00 2021-02-12 06:15:00 2021-02-12 06:20:00 2021-09-18 01:00:00	37.200000 51.973864 67.172000 65.798000 71.275248 135.811000	1.0 1.0 1.0 1.0 1.0	2021.0 2021.0 2021.0 2021.0 2021.0 2021.0	2.0 2.0 2.0 2.0 2.0 2.0	12.0 12.0 12.0 12.0 12.0	6.0 6.0 6.0 6.0 6.0	\
2021-02-12 06:00:00 2021-02-12 06:05:00 2021-02-12 06:10:00 2021-02-12 06:15:00 2021-02-12 06:20:00 2021-09-18 01:00:00 2021-09-18 01:05:00	37.200000 51.973864 67.172000 65.798000 71.275248 135.811000 134.243000	1.0 1.0 1.0 1.0 1.0 1.0	2021.0 2021.0 2021.0 2021.0 2021.0 2021.0 2021.0	2.0 2.0 2.0 2.0 2.0 2.0 9.0	12.0 12.0 12.0 12.0 12.0 12.0	6.0 6.0 6.0 6.0 6.0	\
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	minute	second	i NO	CO	NO2	\
datetime						
2021-02-12 06:00:00	4.000000	15.000000	0.205071	2.200547	0.031007	
2021-02-12 06:05:00	7.272727	31.897727	7 0.206726	2.213276	0.031177	
2021-02-12 06:10:00	12.000000	29.660000	0.210071	2.239005	0.031520	
2021-02-12 06:15:00	17.000000	28.890000	0.213629	2.266378	0.031885	
2021-02-12 06:20:00	22.009901	29.029703	3 0.217205	2.293887	0.032252	
 2021-09-18 01:00:00	 2.000000	 29.710000	 0.009174	 0.765217	0.027826	
2021-09-18 01:05:00	7.000000	29.500000		0.765217	0.027826	
2021-09-18 01:10:00	12.000000	28.600000		0.765217	0.027826	
2021-09-18 01:15:00	17.019802	28.732673		0.765217	0.027826	
2021-09-18 01:20:00	20.000000	26.000000		0.765217	0.027826	
1	NOx	03	PM10	PM2.5	S02	\
datetime	0.000000	0 000000	4F 001000	00 005474	0 004000	
2021-02-12 06:00:00	0.206996	0.002000	45.021898	22.005474	0.004002	
2021-02-12 06:05:00	0.206911	0.002000	45.531022	22.132755	0.004044	
2021-02-12 06:10:00	0.206740	0.002000	46.560219	22.390055	0.004130	
2021-02-12 06:15:00	0.206557	0.002000	47.655109	22.663777	0.004221	
2021-02-12 06:20:00	0.206374	0.002000	48.755474	22.938869	0.004313	
2021-09-18 01:00:00	0.039043	0.015304	20.304348	16.391304	0.001304	
2021-09-18 01:05:00	0.039043	0.015304	20.304348	16.391304	0.001304	
2021-09-18 01:10:00	0.039043	0.015304	20.304348	16.391304	0.001304	
2021-09-18 01:15:00	0.039043	0.015304	20.304348	16.391304	0.001304	
2021-09-18 01:20:00	0.039043	0.015304	20.304348	16.391304	0.001304	
	temperatu	re outdoor	feels like	e pressure	outdoor	\
datetime	temperatu	re_outdoor	feels_like	e pressure	_outdoor	\
datetime 2021-02-12 06:00:00	temperatu		_	-	_	\
2021-02-12 06:00:00	temperatu	14.928066	13.59792	0 102	0.998175	\
2021-02-12 06:00:00 2021-02-12 06:05:00	temperatu	14.928066 14.883093	13.59792 13.54955	0 102 3 102	_	\
2021-02-12 06:00:00 2021-02-12 06:05:00 2021-02-12 06:10:00	temperatu	14.928066 14.883093 14.792181	13.59792 13.54955 13.45177	0 102 3 102 9 102	0.998175 0.955748	\
2021-02-12 06:00:00 2021-02-12 06:05:00	temperatu	14.928066 14.883093	13.59792 13.54955	0 102 3 102 9 102 5 102	0.998175 0.955748 0.869982	\
2021-02-12 06:00:00 2021-02-12 06:05:00 2021-02-12 06:10:00 2021-02-12 06:15:00 2021-02-12 06:20:00 	temperatu	14.928066 14.883093 14.792181 14.695465 14.598266 	13.59792 13.54955 13.45177 13.34776 13.24323	0 102 3 102 9 102 5 102 0 102	0.998175 0.955748 0.869982 0.778741 0.687044	\
2021-02-12 06:00:00 2021-02-12 06:05:00 2021-02-12 06:10:00 2021-02-12 06:15:00 2021-02-12 06:20:00 2021-09-18 01:00:00	temperatu	14.928066 14.883093 14.792181 14.695465 14.598266 15.043613	13.597924 13.54955 13.451775 13.34776 13.243234 14.951226	0 102 3 102 9 102 5 102 0 102	00.998175 00.955748 00.869982 00.778741 00.687044 7.319024	\
2021-02-12 06:00:00 2021-02-12 06:05:00 2021-02-12 06:10:00 2021-02-12 06:15:00 2021-02-12 06:20:00 2021-09-18 01:00:00 2021-09-18 01:05:00	temperatu	14.928066 14.883093 14.792181 14.695465 14.598266 15.043613 14.838548	13.597924 13.54955 13.451779 13.34776 13.243230 14.951224 14.71959	102 3 102 9 102 5 102 0 102 0 101 5 101	00.998175 00.955748 00.869982 00.778741 00.687044 7.319024 7.504324	\
2021-02-12 06:00:00 2021-02-12 06:05:00 2021-02-12 06:10:00 2021-02-12 06:15:00 2021-02-12 06:20:00 2021-09-18 01:00:00 2021-09-18 01:05:00 2021-09-18 01:10:00	temperatu	14.928066 14.883093 14.792181 14.695465 14.598266 15.043613 14.838548 14.633484	13.59792 13.54955 13.45177 13.34776 13.24323 14.95122 14.71959 14.48797	0 102 3 102 9 102 5 102 0 102 0 101 5 101	00.998175 00.955748 00.869982 00.778741 00.687044 7.319024 7.504324 7.689623	\
2021-02-12 06:00:00 2021-02-12 06:05:00 2021-02-12 06:10:00 2021-02-12 06:15:00 2021-02-12 06:20:00 2021-09-18 01:00:00 2021-09-18 01:05:00 2021-09-18 01:10:00 2021-09-18 01:15:00	temperatu	14.928066 14.883093 14.792181 14.695465 14.598266 15.043613 14.838548 14.633484 14.427393	13.59792 13.54955 13.45177 13.34776 13.24323 14.95122 14.71959 14.48797 14.25518	0 102 3 102 9 102 5 102 0 101 5 101 1 101 8 101	00.998175 00.955748 00.869982 00.778741 00.687044 7.319024 7.504324 7.689623 7.875849	\
2021-02-12 06:00:00 2021-02-12 06:05:00 2021-02-12 06:10:00 2021-02-12 06:15:00 2021-02-12 06:20:00 2021-09-18 01:00:00 2021-09-18 01:05:00 2021-09-18 01:10:00	temperatu	14.928066 14.883093 14.792181 14.695465 14.598266 15.043613 14.838548 14.633484	13.59792 13.54955 13.45177 13.34776 13.24323 14.95122 14.71959 14.48797 14.25518	0 102 3 102 9 102 5 102 0 101 5 101 1 101 8 101	00.998175 00.955748 00.869982 00.778741 00.687044 7.319024 7.504324 7.689623	
2021-02-12 06:00:00 2021-02-12 06:05:00 2021-02-12 06:10:00 2021-02-12 06:15:00 2021-02-12 06:20:00 2021-09-18 01:00:00 2021-09-18 01:05:00 2021-09-18 01:10:00 2021-09-18 01:15:00	temperature	14.928066 14.883093 14.792181 14.695465 14.598266 15.043613 14.838548 14.633484 14.427393 14.306405	13.59792 13.54955 13.45177 13.34776 13.24323 14.95122 14.71959 14.48797 14.25518	0 102 3 102 9 102 5 102 0 101 5 101 1 101 8 101	00.998175 00.955748 00.869982 00.778741 00.687044 7.319024 7.504324 7.689623 7.875849	\
2021-02-12 06:00:00 2021-02-12 06:05:00 2021-02-12 06:10:00 2021-02-12 06:15:00 2021-02-12 06:20:00 2021-09-18 01:00:00 2021-09-18 01:05:00 2021-09-18 01:10:00 2021-09-18 01:15:00		14.928066 14.883093 14.792181 14.695465 14.598266 15.043613 14.838548 14.633484 14.427393 14.306405	13.597924 13.54955 13.451775 13.34776 13.243236 14.951226 14.71959 14.48797 14.255186 14.118536	0 102 3 102 9 102 5 102 0 101 5 101 1 101 8 101	00.998175 00.955748 00.869982 00.778741 00.687044 7.319024 7.504324 7.689623 7.875849	\
2021-02-12 06:00:00 2021-02-12 06:05:00 2021-02-12 06:10:00 2021-02-12 06:15:00 2021-02-12 06:20:00 2021-09-18 01:00:00 2021-09-18 01:05:00 2021-09-18 01:15:00 2021-09-18 01:15:00 2021-09-18 01:20:00 datetime 2021-02-12 06:00:00	humidity_o	14.928066 14.883093 14.792181 14.695465 14.598266 15.043613 14.838548 14.633484 14.427393 14.306405	13.597924 13.549554 13.451779 13.347764 13.243234 14.951224 14.719594 14.48797 14.255184 14.118534	0 102 3 102 9 102 5 102 0 101 5 101 1 101 8 101	00.998175 00.955748 00.869982 00.778741 00.687044 7.319024 7.504324 7.689623 7.875849	
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