My Latex automated Report

Generated from my notebook.ipynb

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1 Initialisation

1.1 import packages

The required packages for this Notebook are:

Package	Version
ipypublish	0.10.10
prettytable	0.7.2
numpy	1.16.5
pandas	0.25.1
matplotlib	3.1.1
ipython	7.12.0

Table 1: the required packages

1.2 definition of functions

1.2.1 function tp display beatiful tables

Example 1: pretty Dataframe Tables

```
def pretty_df(df,n=0,wide=False,label="",caption=""):
    """
    For more Information Check PrettyTable.py
    """
    df2=df.round(n).reset_index()
    col=[w.replace("_", " ") for w in list(df2.columns)]
    return pt.PrettyTable(df2.values,col,wide_table=wide,label=label,caption=label)
```

1.2.2 another function

2 import data

The data for this example are generated with the demo version of meteonorm 7

the data will be dealing with the weather data of the berlin tempelhof weatherstation on monthly basis.

Symbol	Unit	Description
G Gh	kWh/m²	Global solar irradiance monthly averages
G Dh	kWh/m²	Diffuse solar irradiance monthly averages
Ta	°C	Air temperature
Td	°C	Dew point
FF	m/s	wind speed

Table 2: Variable and units of weather data

3 Text and Images

3.1 markdown image and text

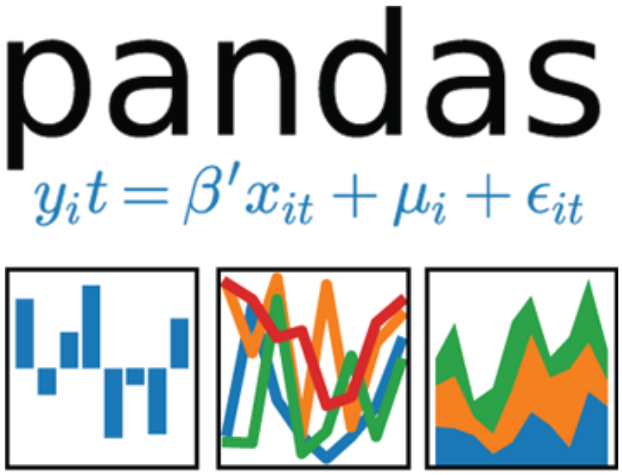

Figure 1: Pandas Logo

3.2 Code images and text

Figure 2: horizintal concatenation of 2 Python Logo

The here above images are generated from the concatenation of 2 images, using `nb_setup.images_hconcat`

4 Example of a table

4.1 table small

Example of Small tables showing monthly weather data for berlin

index	month	G Gh	G Dh	Ta	Td	FF
0	nan	kWh/m²	kWh/m²	°C	°C	m/s

Table 3: Variable and units of weather data

index	G Gh	G Dh	Ta	Td	FF
1.0	20.0	12.0	1.0	-2.0	4.0
2.0	36.0	20.0	2.0	-1.0	4.0
3.0	76.0	43.0	4.0	0.0	5.0
4.0	124.0	67.0	10.0	3.0	3.0
5.0	154.0	78.0	15.0	8.0	5.0
6.0	164.0	85.0	17.0	11.0	4.0
7.0	160.0	81.0	19.0	13.0	4.0
8.0	136.0	68.0	19.0	13.0	4.0
9.0	94.0	47.0	14.0	10.0	4.0
10.0	55.0	32.0	10.0	7.0	4.0
11.0	24.0	16.0	5.0	3.0	4.0
12.0	15.0	10.0	1.0	-1.0	6.0

Table 4: Monthly weather data for berlin

4.2 Table wide

This is an example of wide table with random float rounded to 3 position after comma

index	col 1	col 2	col 3	col 4	col 5	col 6	col 7	col 8	col 9	col 10	col 11	col 12	col 13	col 14	col 15
0.0	87.072	248.203	99.908	208.615	141.326	154.671	227.536	212.102	22.32	16.284	138.059	146.53	116.753	240.239	2.742
1.0	190.363	156.683	172.959	95.866	237.877	3.781	61.966	36.781	203.807	147.06	183.727	218.934	147.14	54.141	112.559
2.0	138.606	104.005	56.683	95.267	45.171	195.579	178.167	240.534	202.904	117.572	133.89	226.947	186.089	160.561	114.957
3.0	65.185	15.893	128.69	27.535	99.17	81.21	131.319	199.468	187.053	64.538	164.081	145.443	123.835	99.904	65.927
4.0	242.503	126.268	163.671	120.312	106.322	175.056	7.136	123.092	210.092	195.073	71.327	39.06	10.758	14.713	38.449
5.0	70.944	63.541	171.729	234.062	103.621	204.337	126.613	94.899	135.673	225.754	167.303	193.296	237.862	34.685	48.716
6.0	17.241	24.77	139.7	207.719	151.335	28.719	176.532	216.899	140.65	68.722	133.041	45.072	178.73	123.51	207.088
7.0	156.837	23.794	160.082	16.085	100.067	94.824	47.392	132.01	225.246	36.629	19.409	48.69	227.611	133.451	247.034
8.0	4.896	175.341	7.601	80.974	247.456	17.272	26.539	225.575	196.02	39.064	168.999	69.112	52.282	106.748	17.21
9.0	151.131	62.366	184.718	221.959	168.595	33.983	144.223	228.176	139.35	228.082	99.027	163.084	63.151	238.116	144.775
10.0	136.272	235.136	204.91	191.44	197.369	55.954	118.136	116.264	59.923	145.1	191.205	35.457	55.236	134.388	235.144
11.0	139.727	68.147	201.795	44.553	14.072	70.154	238.94	202.483	156.414	185.268	14.832	249.212	137.29	35.846	251.988
12.0	218.299	75.001	146.094	238.302	191.031	9.206	70.258	180.248	155.927	152.149	176.428	230.966	18.393	124.391	43.359
13.0	162.364	48.716	78.711	143.793	132.633	50.04	37.898	28.999	177.193	30.14	32.414	212.193	43.948	66.405	10.852
14.0	124.492	153.876	234.345	3.802	63.364	147.412	166.393	241.753	187.228	16.383	76.058	101.659	88.532	34.775	187.772
15.0	182.77	85.679	71.859	191.919	85.998	111.777	188.225	50.13	17.973	199.384	122.369	147.003	22.208	181.664	141.03
16.0	231.624	65.529	243.541	130.99	2.062	35.205	54.156	154.209	193.842	224.172	101.902	236.301	155.382	245.459	94.601
17.0	173.324	211.656	105.162	161.443	145.41	21.901	207.42	37.53	149.516	10.04	6.141	61.444	50.059	253.862	153.103
18.0	36.799	30.029	241.983	125.41	228.293	48.819	24.161	224.524	116.004	106.443	251.5	140.521	229.524	136.281	125.602
19.0	191.547	206.68	63.301	56.337	182.498	130.324	107.933	2.52	223.872	31.974	21.516	95.907	224.317	170.532	146.667

Table 5: wide table of random numbers

5 Example of chart

5.1 chart bar

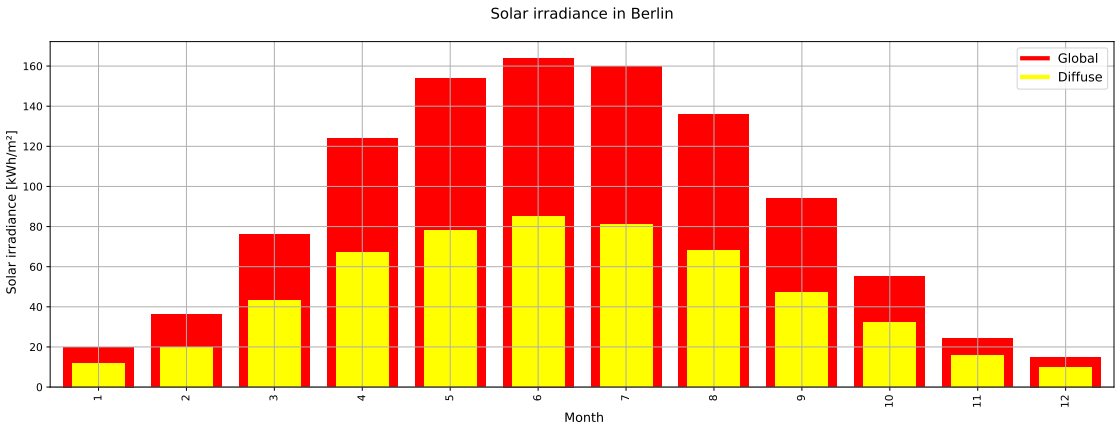

Figure 3: Solar Irradiance in Berlin

5.2 chart scatter

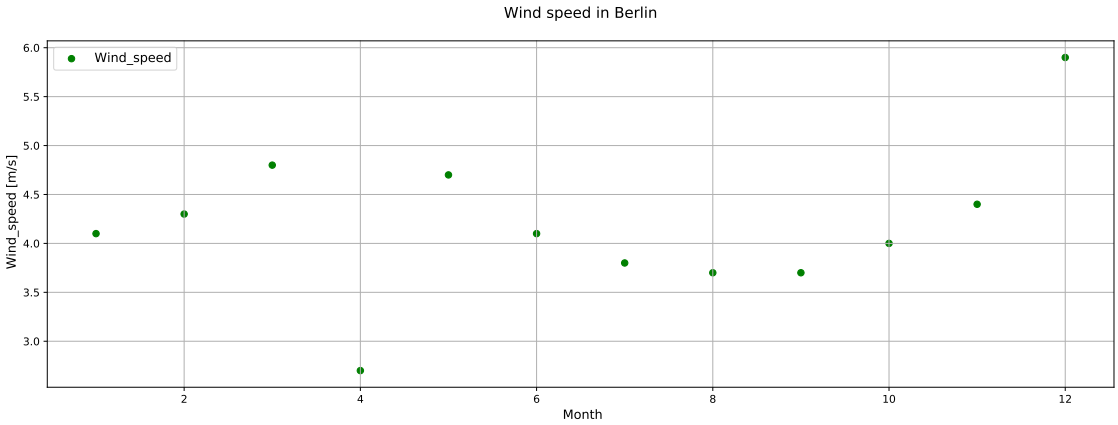

Figure 4: Wind speed in Berlin

5.3 chart line

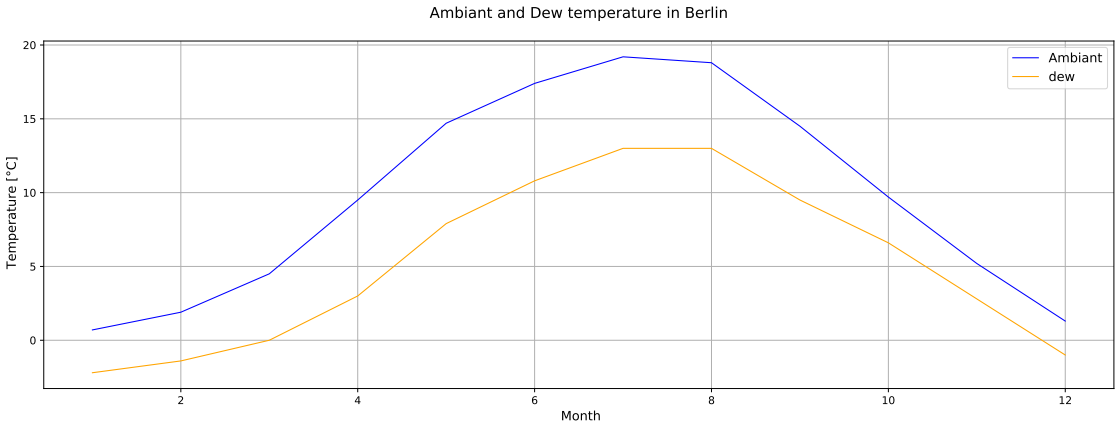

Figure 5: Ambiant and Due temperature in Berlin

6 Example of matematic formulas

example 1: Linear function

$$y = ax + b \tag{1}$$

with:

- x: Abscissa
- y: Ordonate
- a: Slope
- b: Initial Value

example 2: Sum Gaussian Integer

$$\sum_{i=1}^{\infty} i = \frac{n(n+1)}{2} \tag{2}$$

example 3: Gamma three half

$$\Gamma\left(\frac{3}{2}\right) = \int_0^{\infty} x^{\frac{3}{2}-1} e^{-x} dx = \int_0^{\infty} \sqrt{x} e^{-x} dx = \frac{1}{2}\sqrt{\pi} \tag{3}$$

7 Referencing

7.1 Images

Referencing Images:

- The image : 4 Is a plot of type scatter using matplotlib
- The image : 5 Caption and label will be edited in Cell Metadata with:

```
"caption": "caption text",
"label": "fig:reftext"
```

7.2 Tables

The table 1 represent the content of the file requirements.txt generated with `pipreqs`

7.3 Equations

Referencing equations:

- The equation 1 represents Linear equation or first order Polynome
- The equation 2 represents the sum of Gaussian Integers
- The equation 3 represents a specific gamma function, namely: $\Gamma\left(\frac{3}{2}\right)$

8 Generation of the template

```
Overwriting my_template.tplx
```