Lesson II Exercise

Dataset: `bejing_air_quality.csv`

1) Load the dataset into a Pandas DataFrame. Create a DatetimeIndex by properly merging the columns “year”, “month”, “day”, “hour”.
2) Filter the samples from Jan 2014 to Jan 2017.
3) By applying the undersampling technique, compute the **weekly** average of the "PM2.5" sensor. Plot the result.
4) By applying the undersampling technique, compute the **monthly** average of the "PM2.5" sensor. Plot the result.
5) By applying the moving average technique, compute the average of the "PM2.5" sensor, with a window size equal to 30 days. Plot the result.
6) Compute on a **monthly** base the number of environmental alerts. An alert is triggered when the value of the "PM2.5" sensor is higher than a threshold (set to 50 µg/mc). Plot the result.
7) Shift the time series of "PM2.5" sensor of 2000 samples forward in time. Plot the original and the shifted time series.