HWK #2: compressing data and information:

(Do HWK #2 as a sequence of HWK #1.)

Due date: Friday, 04/05/2024, at 11:59 pm.

For data compression purposes, you should create an Auxiliary DB (rebuilt every 6 minutes) and a Final DB (with the data from the 6-minute calculations – see below).

(You should use MongoDB and SQLite.)

1. Calculate **Max**, **Min**, **Max-Min**, **Mean Value,** and **VOL** in real-time and continuously updated for 6 minutes. (**VOL** = **Max-Min/Mean Value**.)

2. After the first period of 6 minutes, calculate 100 Keltner Upper Bands, and update it every subsequent 6 minutes:

   Keltner Channel Upper Bands = **Mean Value +** n*0.025***VOL**, n from 1 to 100, where **Mean Value** and **VOL** are calculated from the previous period of 6 minutes.

3. After the first period (6 minutes), calculate 100 Keltner Lower Bands, and update it every subsequent 6 minutes:

   Keltner Channel Lower Bands = **Mean Value –** n*0.025***VOL**, n from 1 to 100, where **Mean Value** and **VOL** are calculated from the previous period of 6 minutes.

Note: Every time you start a new 6-minute period (after the first 6 minutes), you know the 100 Keltner Upper Bands and the 100 Keltner Lower Bands calculated at the end of the previous 6-minute period.

Repeat the process for 5 consecutive hours.

4. From period **#2** to period **#50**, inside every 6-minute bucket, count ***N*** the number of times the price of a currency pair crosses a Keltner Channel and divide it by **Max-Min**. Put **FD** = ***N***/ **Max-Min** (FD from the Fractal Dimension). So, from period #2 to period #50, you will build a sequence of data vectors V_i with 6 data information:
   a. Two timestamps (data & DB)
   b. Max
   c. Min
   d. Mean
   e. VOL
   f. FD.

5. Sumit the codes, the Final DB, and the *.csv file on Brightspace.