FTEC5530 Assignment I. Calculation of Stock Market Micro-structure

Tick data sample(trade and quote) is provided in the month of 2020 Dec(trade.csv and quote.csv)

1. **Estimate the Average Daily Volume (ADV), Average Daily Turnover (ADTV) and daily volatility (Annualized), average spread, avg quote size of each stock in the month of 2020 Dec. （score: 40% ）**

Result should be in a format like below:

Stock	ADV	ADTV	Daily Volatility	Spread (bps)	Quote Size
000001.SZSE					
600030.SHSE					

Hint: generate daily data from trade and quote and perform above calculations

2. **Generate the intraday market micro-structure report for stock 600030, draw the every 5-min intraday chart for volume profile, intraday volatility(normalized to one day)/spread/quote size profile (score: 60%)**

Format sample:

time	intradayVolatility	spread	quoteSize	volpct
9:25				0.5%
9:30	4.3%	7.8	17,871	4.6%
9:35	3.4%	7.3	20,000	4.2%
9:40	2.8%	6.7	22,660	3.4%
9:45	3.5%	6.8	19,209	3.4%
9:50	2.7%	6.6	23,124	2.9%

Hint: generate minutely data from the raw and quote data, and perform calculation.

Kdb sample code:

```
t: ("DSTFF";enlist ",") 0:`$"c:/temp/trade.csv";

q: ("DSTFFFF";enlist ",") 0:`$"c:/temp/quote.csv";

q: select from q where time within (09:30;11:29:59.999) or time within (13:00;14:59:59.000); //remove auction quote
```

Requirement:

Provide both of your code script (python/R/MATLAB/KDB or other languages) and result. KDB is preferred.