Assignment: Part 2: SQL

Elliot: We have put together a series of SQL questions in increasing difficulty. If you cannot answer all of the questions, that is fine, it helps us gauge your fluency. This section does not require an actual database connection. Sample table schema are provided below. Provide as much syntax as makes sense, and speak to the logic of your approach otherwise.

Logic/approach described here, syntax not for running purpose

1) Calculate each stocks compound returns between 12/31/2018 and 12/31/2019.

I would use some sort of arithmetic log function and nested table with self join.

```
 select q_ending_total_return, exp(sum(ln(q_ending_total_return)) over (partition by ticker order by
t_date))
 from   performance
 where  t_date in (date'2018-12-31', date'2019-12-31')
 group by ticker
 order by t_date asc;
```

2) Calculate 1yr rolling average and standard deviation of e_scores, averaged across all stocks.

```
select ticker,
avg(score) over (order by t_date ROWS BETWEEN 4 PRECEDING AND CURRENT ROW), # we are using
last 4 quarters to get moving average here for 1 year (assumed quarterly data)
stddev(score) (order by t_date ROWS BETWEEN 4 PRECEDING AND CURRENT ROW)
from e_scores
group by ticker
order by t_date asc;
```

3) Skipped

4) Calculate the quarterly performance of a portfolio comprised of securities in the S&P with below average e_scores in the previous quarter.

Logical steps:

a) Take average of all stocks score from previous quarter (t_date - 1) from table "e_scores"
b) Use the average score from step 1 to see which stocks are below that number in previous quarter
c) Calcualte quarterly perforamance using list from step 2 by joining with table "Performance" to get (t_date - 1) quarterly performance

5) Calculate the quarterly performance of a portfolio comprised of securities in the S&P with below average e_scores in the previous 4 quarters.

Logical steps:

a) Take average of all stocks score from previous quarter (t_date - 4) from table "e_scores"
b) Use the average score from step 1 to see which stocks are below that number in previous quarter
c) Calcualte quarterly perforamance using list from step 2 by joining with table "Performance" to get (t_date - 4) quarterly performance

6) Given a 1% risk free rate, calculate the Sharpe ratio of each stock and of the S&P 500.

Logical steps:

a) Get average return of "q_ending_total_return" as "R1" & Standard Deviation as "Std" in "Performance" table using group by "ticker"
b) Hard code 1% as risk free return which will be used as "R2"
c) Calculate (R1 - R2)/Std as Sharpe ratio