IE 360 Term Project (Fall 20)

Description

Our main task will be devising approaches to forecast the next-day's hourly consumption values for Turkish electricity market. In other words, we are expected to provide 24 predictions corresponding to the hours of the next day.

The data covers hourly consumption levels together with the temperature values/forecasts for 7 grid points close to big cities in Turkey. These are the following pairs for the encoded temperature levels (as T_1, T_2, and etc.):

```
lats = c(36.5, 37  , 38  , 38.5,39.75, 40 ,41)
lons = c(32.5, 35.5, 32.5, 27  ,30.5,  33 , 28.75)
```

You are also free to use any external data if you think it is useful (i.e. Google Trends).

This project is organized as live competition in which you are expected to make submission everyday. For this purpose, we have built an application programming interface (API) so that you can programmatically get the data, manipulate it, build your forecast models and make submissions. The aim is to make you develop a forecasting product. Developed product can be used in various business areas, such as setting up appropriate inventory or service levels. Accurate forecasts help businesses in reducing waste and understanding the uncertainty and its risk implications.

Evaluation

You are expected to provide your next day's (time t + 1) predictions regularly before 12:00 every day (time t). You are allowed to make more than one submission, however we will only evaluate your latest submission before 12:00. Also, you need to make predictions for all 24 hours. System will not allow otherwise. Each day, we will sort each group by the weighted mean absolute percentage error (WMAPE) of their predictions. All of the groups will be sorted by the WMAPE of their latest submission. Then, according to your daily ranking, you will get your ranking points. For example, if there are 24 groups, the 1st group will get 24 points, 2nd will get 23... and so on. If you have not made any submissions, you will get 0 ranking points. Please, try to make the most of this experience!

You will have 300 requests/day as your total requests limit you can send to the system. After this point, you will be blocked for 24 hours. In this case, please contact us at mert.yuksekgonul@boun.edu.tr

Timeline

You have been given your passwords and usernames for access to the system. Then, for the coming weeks, it will be the trial period. Take the trial phase to ask your questions, play around with the system and build your prediction pipeline. It will also be a chance for us to fix any unforeseen issues. We will proceed with the evaluations as usual, however we will restart all of the scores on January 29th, 2021. Then, the actual project phase will begin. The submission system will be closed after February 12th, 2021.

Deliverables

You will be presenting your work towards the end of the semester (to be announced later, probably after finals). You are also expected to report your approach and findings as a document. Your report should have the following format:

1. Introduction : Problem description, summary of the proposed approach, descriptive analysis of the given data.
2. Related literature : Summarize relevant literature if there is any
3. Approach : Explain your approach to this problem.
4. Results : Provide your results and discussion.
5. Conclusions and Future Work : Summarize your findings and comments regarding your approach. What are possible extensions to have a better approach?
6. Code : Provide the Github link for your codes at the end of your report.

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