IOE 565 PROJECT DESCRIPTION
Fall 2018
Prof. Eunshin Byon

1. Overview

The course project aims to provide students an opportunity to apply (and extend) the time series techniques taught in the course to the modeling and analysis of real datasets. In doing this, you should gain better insight into the capabilities of time series techniques.

You are required to write a report documenting your work, and give a clear and concise presentation of the material at the end of the term. For the project, you should work in groups. Each group should consist of four students.

2. Data

The wind measurements at 4 stations and their location information are provided. The data is available for period ranging from 01:00 of 1/1/2007 to 24:00 of 12/31/2008. Please note that there were 366 days in 2008.

(1) The file "**wind_data.csv**" contains the wind speed (unit: m/s) and direction (degree). measurements for 4 stations. In this file, there are timestamps giving date and the time of the hourly wind measurements; From the 2nd to the 5th columns represent the wind speed at station #1, #2, #3, and #4, respectively. From the 6th to the 9th columns represent the wind directions at the corresponding locations.

(2) The file "**coordinate.csv**" contains the location information of each station, including latitude, longitude, and elevation (unit: feet).

3. Goal

The goal is to make 1- to 3-step (hour)-ahead wind speed forecasts at the four stations. Each group should report the 1- to 3-step-ahead wind speed forecast for the period from 01:00 of 12/01/2008 to 00:00 of 1/1/2009. With the actual observations provided, students can evaluate their models' prediction performance by comparing their predicted values with real observations.

4. Schedule (tentative)

(1) One page proposal submission by October 25, 2018: The proposal should contain the following information: (1) Group members and (2) One paragraph abstract.

(2) Final report by December 4, 2018 (9am): The report should be submitted on CANVAS in designated folders, including the following four items.

- **Project report** that includes
  (1) Introduction (i.e. background, objectives, and a brief summary of the results),
  (2) Analysis procedure

(3) Prediction results and discussion of the results, and
(4) Conclusion.

- **Forecasting results**: Each group should submit the excel file (Group# - ForecastingResults.xlsx – please replace "#" with your group number in the file name) to report 1- to 3-step-ahead wind speed predictions from 12/1/2008 1:00 to 1/1/2009 00:00 for 4 stations.
- **Code**: you can use R, MATLAB, and Python only. And your code should generate the same Forecasting results shown in the excel file.
- **Presentation slides**

(3) **December 4th, 6th, 11th (possibly 18th): Project presentation**. Each group will give a 15-minute presentation and additional 3 minutes will be devoted to discussion and questions (presentation time/schedule may change later). Also, the presentation slides must be handed in. All students are REQUIRED to come to the project presentation lectures.

5. Evaluation

The project presentation and report will be evaluated by the instructor. There will be peer evaluation among team members.