INDR 450/550

Spring 2022

Project Information

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Course Project

- Implementation of predictive analytics integrated with a reasonable prescriptive problem that uses the data from the predictive part.
- Data sets:
  - Monthly auto sales
  - Monthly refrigerator/dishwasher/oven
  - Some call center data (Daily calls)
  - Daily natural gas consumption (from EPİAŞ)
  - Price indices for commodities (from IMF)
  - Google mobility data (daily) (on retail, transportation, etc.)
  - Additional sources: TÜİK, TCMB etc.

Predictive part

- Please use time-series data preferably.
  - Test reasonable simple approaches (moving averages, expo. Smoothing etc.) to obtain a benchmark on the error.
  - Implement an ARIMA model
  - Use a regression-based model with binary variables, polynomial time features and exogenous predictors if possible
  - Non-linear regressions, trees forests etc.
- Please try to be careful and complete on validation

Prescriptive part

- Use the predictive model (including prediction errors) to solve a plausible optimization problem.
  - Schedule a call center so that a 90% call response service level is met.
  - Find the Daily safety stock of natural gas so that the probability of a stockout is less than 1/1000.
  - Find the number of Fiat autos to keep in stock each month for a service level of 90%
  - Etc.

Project expectations

- The work is like an extended homework.
- You can work in groups of 2 or 3.
- But it should be written as a report (of about 10-15 pages) that describes the analysis and the results.
- Each Project may be a little different