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CMPT 733 Big Data Science - Template for Capstone Project Idea

Explore the Impact of Weather on Short-time Demand Forecast for Fashion Retailers

Description

Forecasting the demand in the fashion industry is a notoriously challenging problem. The difficulty mainly lies in the volatility of the demand because of a complex environment of competitors, price options, consumer buy strategies as well as hard-to-predict factors such as the weather. In such a harsh environment, those retailers will survive in business who can respond quicker and adapt faster. The focus of this project is to explore the impact of weather on the demand forecasts.

The impact of weather could be multi-faceted: less walk-ins due to harsh weather leading to drop in sales (just think about the recent snowfall in Saint John, NB!) or the increased demand for some products and potential increase in profit. A retailer who can incorporate weather information into its forecast and ordering decision making processes could respond faster and potentially benefit a lot. Some studies already suggest the significant impact of exploiting weather-related information on having more accurate demand forecasts. The objective of this project is to quantify the value of including weather data in demand forecasts and get an understanding of the reliable temporal horizon for which weather data is useful.

The project involves the following steps:

- Coming up with a set of useful weather-related data that could potentially affect demand
- Search for an appropriate weather API:
    - the API should have the required data
    - considering the API's geographic coverage and spatio-temporal resolution
    - considering the API should have historical data for the points of interest
- Create a pipeline to daily ingest weather data into AWS S3
- Feature engineering: create useful features from raw weather data
- Choosing the right model/algorithm that can accommodate weather data in forecasts

Datasets

The dataset for this project consists of 3-4 years of anonymized sales transaction data of a Canadian fashion retailer and will be provided by FIND. For each transaction city-level location information will be provided.

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