1. Forecasting runoff using time series data and RNN

Flooding is increasingly becoming one of the most difficult challenges to tackle. As the population is increasing, there is more urbanization resulting in more impervious developments, which results in decrease of infiltration and increase of runoff (sometimes resulting in flooding). If we can predict the runoff in advance, we might be able to predict if there is going to be flooding event in future. I will use time series of weather data (such as rainfall, temperature etc.) from NCDC and other data such as land use, soil, management to develop a multivariate recurrent neural network. This model can be used to predict future runoff using forecasted weather data.

The objective is to build a RNN time series model that can predict future runoff using forecasted weather data.

Weather data set can be downloaded from:

https://www.ncdc.noaa.gov

1. Model to maximize profits for food and retail stores

Data are available for retail stores from various sources about their sales, purchases, taxes, inventories and others. This data can be used to predict inventory and sales for the upcoming months or years. Monthly and annual retail trade data is available from 1992 to present from United States Census Bureau.

The objective of the study will be to analyze previous data from various retailers and develop a model to maximize the profits for retailers in the future.

Data is available at:

<https://www.census.gov/retail/index.html#mrts>

1. Risk analysis to calculate interest rate for insurance and banking industry

Lot of data is generated from several kind of insurance industries and banking sectors in United States. There are several factors that affect the interest rate that an individual or a household has to pay depending on their geographical location, demography etc. These variables can be used to estimate the current interest rates and for predictive analysis.

The objective of this project will be do develop a model to estimate the interest rates for insurance and banking industries based on demographic factors.