CMSC421

Snow Day Predictor

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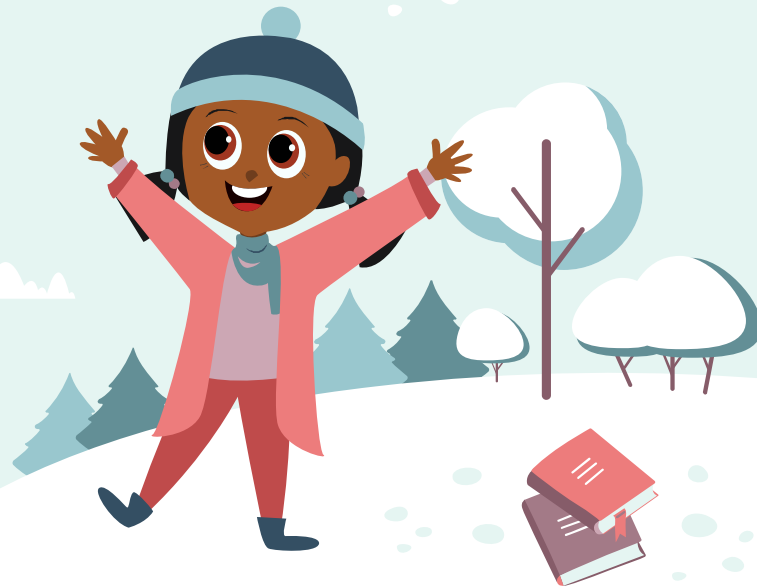

Problem: Many factors go into deciding a school closure

1. Weather conditions
2. Road conditions
3. Previous closures
4. ...

Motivation: To empower individuals, particularly parents and children, to better anticipate potential closures

1. Plan off-day from work
2. Plan getting a caretaker

Goal: Create a tool that can accurately predict whether a given day would have a snow day closure

Issues

- During data collection, we ran into issues with data access
- Almost no county had publicly available sources of information on previous school closures
- The main way we had to acquire data was through scraping twitter but even that did not contain all the closings

Pivot

We decided to focus on just one county as that allowed for the most reliable and accessible data

Our Tools

scikit learn

React

Open-Meteo

Model

Naive Bayes

- We first planned to use Naive Bayes for our model
- Considering our data was heavily skewed — very few snow day closures in a given year — Naive Bayes overfit and did not predict precisely enough

Random Forest

After reviewing literature, we decided to use Random Forest for our model as it more effectively deals with the label imbalance in our data

Results and Evaluation

- Model identified approximately **50% of snow day closings**
- **22% of predicted snow days matched actual snow days**
- **Overall accuracy:** 97% in determining closing days
- **Challenges:**
  - Limited snow day instances (2014-2020)
  - Difficulty in achieving full accuracy due to minimal data
  - **Evaluation challenge:** risk of imbalance in training/test sets with all closings in one set

We will also display a live demonstration of our Application.

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Sensitivity (Recall): 0.50
Precision: 0.22
Accuracy: 0.9671532846715328
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