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| Data  Analysis  Project  University of Toronto |
| Project 1 - Group 2 Caroline Bordin Jasmine Bamba Narisha B. Nikita Gahoi |



### **Proposal**

Investigating the correlation between Wildfire Frequency, Temperature Increase, and Deforestation in Canada

### **Introduction:**

Wildfires have become a significant concern globally, impacting ecosystems, human communities, and the environment. In Canada, the frequency and intensity of wildfires have been on the rise in recent years, raising questions about potential correlations with temperature increase and deforestation. This proposal aims to analyze historical wildfire data, temperature trends, and deforestation patterns to determine if there are any significant connections.

### **Objectives:**

### To explore whether there is a correlation between temperature increase and the frequency of wildfires in Canada.

### To track and visualize the historical number of wildfires in Canada over the years.

### To investigate the potential correlation between wildfire frequency and the months of the year.

### To assess the impact of deforestation on fire spread patterns compared to natural forested areas.

### **Methodology:**

### Data Collection:

### Acquire historical wildfire data from reliable sources, including the number of wildfires, their locations, and dates, covering a significant time span.

### Obtain temperature records for the same period to study temperature trends.

### Gather data on deforested areas and natural forested areas.

### Data Analysis:

### Clean and preprocess the datasets to ensure data quality.

### Conduct statistical analysis and data visualization using Python and Jupyter Notebook to identify trends and patterns.

### Perform correlation analysis between wildfire frequency and temperature increase using the Pandas library.

### Analyze the frequency of wildfires in different months using the Matplotlib library to assess any potential seasonality.

### Visualization:

### Create visualizations such as line graphs, scatter plots, and heatmaps using Matplotlib and Seaborn libraries to represent the relationships between variables.

### Generate maps using Geopandas to display the spatial distribution of wildfires and deforested areas.

### Interpretation:

### Interpret the findings from the analysis using Python and Jupyter Notebook to determine if there is a correlation between temperature increase and wildfire frequency.

### Identify potential months with higher wildfire occurrence based on the data analysis.

### Compare fire spread patterns in deforested areas and natural forested areas using statistical analysis and data visualization tools in Python.

### **Deliverables:**

### Detailed analysis report: This will include the methodology, data sources, findings, visualizations, and interpretations.

### Visual representations: Charts, graphs, and maps depicting the correlations and trends.

### Code repository: A public repository containing the Python code used for data analysis and visualization.

### **Data Sources:**

### National Forestry Database

### [Forest Fires | National Forestry Database (ccfm.org)](http://nfdp.ccfm.org/en/data/fires.php)

### **Conclusion:**

### This research project aims to explore the correlation between temperature increase and wildfire frequency, as well as the potential impact of deforestation on fire behavior in Canada. The findings from this analysis will contribute valuable insights into wildfire patterns and their underlying drivers, enabling better-informed decisions and strategies for wildfire management and mitigation.