Regression Analysis

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Data Analysis of Traffic Counters - A Story about Nowruz

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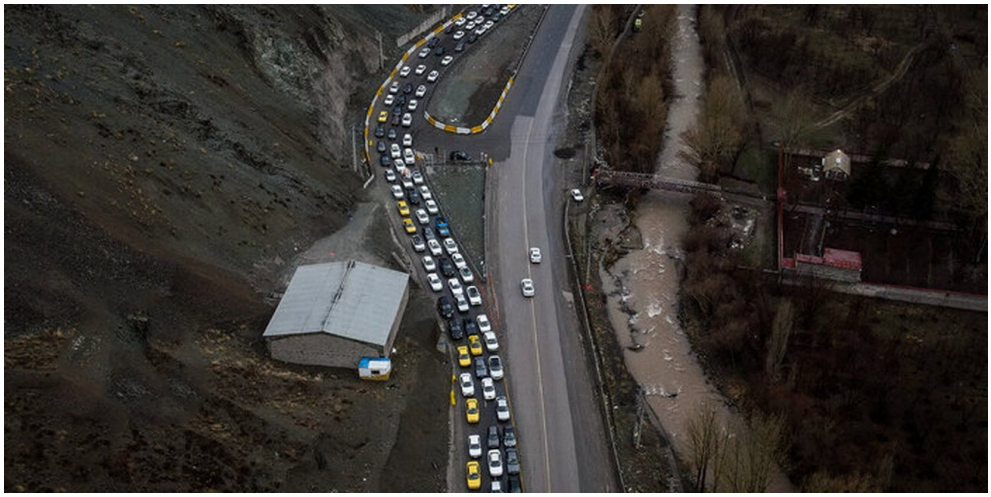

Figure 1: Heavy traffic on Haraz Road. Photo from article on 24/06/1402.

1 Introduction

In this project, we aim to identify and study the five most visited northern cities of Iran during the Nowruz holidays by conducting a thorough analysis of the data recorded by traffic counters in the provinces of Gilan, Golestan, and Mazandaran through the **141.ir** website. This analysis, using precise and complete input data from the said system, enables us to identify the cities that experienced the highest traffic during the holiday period.

2 Reason for the Study

With the onset of spring and the approach of Nowruz, the north of the country shines as a popular destination for travelers. The lush nature, beautiful beaches, and abundant natural landscapes of these areas attract attention and create a sense of tranquility. Now, we aim to examine the preferences and tendencies of travelers to better understand and determine the best destinations for Nowruz travel.
By precisely analyzing their interests, we seek to create an unforgettable experience for this group of travelers. Analyzing this topic holds numerous values, which are mentioned below:

- Analyzing travelers' preferences allows us to optimize our resources and time. Having precise information about travelers' favorite destinations enables us to better allocate our financial and time resources. This leads to achieving greater productivity in the tourism industry.

- We can then encourage travelers to visit their preferred destinations by offering services that best match their preferences. This can directly contribute to the growth of the tourism industry in different areas of the country and realize economic and social advancement.
- By identifying and examining the most popular destinations, we can focus on other cities and areas with tourism potential to implement necessary improvements in infrastructure, services, etc. This action allows us to better identify problems and provide suitable solutions. Moreover, by offering more attractive services and opportunities, we can help divert some of the traveler traffic from popular destinations to these new areas, thus aiding in the development of diverse tourism offerings.

3 Main Idea of the Analysis

The traffic counter data, which includes the hourly traffic counts for each route based on different vehicle classes, provides valuable information for analyzing the behavioral patterns of travelers in various areas. In this study, we intend to use the data related to **Class 1** and **Class 2** categories , especially the former class, and the traffic counts of each class to examine the entry routes to the northern cities during the Nowruz holiday periods over several years.
Assumptions of the problem:

- It is assumed that all **Class 1** vehicles are private and do not include government or emergency vehicles.
- It is assumed that all passenger vehicles on the routes are non-local residents intending to travel to the northern provinces.

Based on the mentioned analysis method, we first remove the data related to bypasses and filter the data files using a list of cities for each province obtained from **Wikipedia**. The importance of this step lies in the fact that some routes are merely transit routes and tourists do not have the possibility to stay at the destination.
Having a list of cities and villages of each province is necessary for a more accurate analysis. The variables required for this analysis include columns for **Route Code or Name**, **Start Time**, **End Time**, and the **Number of Class 1 and 2 Vehicles**.

4 Challenges and Limitations

The available data is between the years of **1395** to **1401**. During this period, there were restrictions on travels due to the COVID-19 pandemic (in the years **1398** and **1399**), which complicates the analysis.
Another challenge is the missing data. According to a preliminary study, the traffic counters were turned off during certain hours of the day and night, and data from those hours are not available.

5 Management and Coordination

- One to two virtual meetings will be held weekly on **Google Meet**. (At least one meeting on **Wednesdays from 11:00 to 13:00**)
- Utilizing task manager applications such as **Trello** and **Clockify** for task distribution.