MFE-2 Project Report

by Kanika Sunaria

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MFE-II PROJECT REPORT

Submitted to Dr. Ranjib Banerjee
Faculty of Mathematics for Engineers – II , 22

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CSE - I

SCHOOL OF ENGINEERING AND TECHNOLOGY

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HARYANA

Date - 14th May, 2023

CANDIDATE'S DECLARATION

We, *Anika, Kanika, Payal and Himanshu* , hereby declare that the project entitled "**Statistical Analysis of Road Accidents in India** " in fulfillment of completion of the 2nd-semester course – Joy of Engineering as part of the Bachelor of Technology (B.Tech) program at the School of Engineering and Technology, BML Munjal University is an authentic record of our work carried out under the supervision of Dr. **Ranjiv Banerjee** . Due acknowledgments have been made in the text of the project to all other materials used.

This project was done in full compliance with the requirements and constraints of the prescribed curriculum.

Anika Sharma	220324
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Date:

SUPERVISOR'S DECLARATION

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

Faculty Supervisor Name: Dr. Ranjiv Banerjee
Signature:

PROJECT TITLE: Statistical Analysis of Road Accidents in India

Abstract:

Driver negligence is to blame for India's high rate of traffic accidents. Numerous Indian motorists engage in risky driving behaviors including speeding, weaving through traffic, and disobeying traffic signs. The risk of accidents is also increased by the fact that many drivers are doing so while under the influence of drugs or alcohol. Poor road infrastructure, such as poorly constructed roads, improper signage, and insufficient illumination, is another risk. Seat belts and other safety equipment in vehicles are frequently neglected or not utilized at all.

The Indian government has taken a number of steps to solve these challenges, including tighter enforcement of traffic regulations, improved road infrastructure, and programmes to promote safe driving practices. However, more work needs to be done to maintain the safety of Indian roads. For instance, driver education and training needs to be improved. Traffic regulations also need to be strictly enforced. India can decrease the number of accidents and fatalities on its roads and make them safer for all users by addressing these issues.

Road accidents in India are the subject of this data research, which focuses on the years 2014 to 2017. The National Crime Records Bureau (NCRB) and the Ministry of Road Transport and Highways were two of the sources from which the information was gathered. The investigation explores elements that cause accidents, such as driver behavior, road conditions, and car safety features, as well as the prevalence of accidents, fatalities, and injuries.Additionally, the analysis compares accident rates in other Indian regions and discusses how the results may affect public policy. The analysis' findings highlight the pressing need for increased road safety in India and offer information on the best methods for lowering the rate of collisions and fatalities there.

Introduction:

Road accidents in India result in a significant number of fatalities and injuries each year, posing a serious threat to public safety. In 2019, there were a total of 4,37,396 road accidents in India, resulting in 1,54,732 fatalities and 4,39,262 injuries, according to the National Crime Records Bureau (NCRB).

It's crucial to examine road accidents in India in order to pinpoint their primary causes and create efficient prevention and mitigation plans. The frequency and severity of road accidents are influenced by a variety of factors, including human behavior, road infrastructure, vehicle safety, and emergency response systems.

Road accident analysis can be done in a variety of ways, such as statistical analysis of accident data, analysis of accident hotspots, and in-depth examination of individual accidents. Researchers can find patterns and trends in accidents by analyzing accident data, including the kinds of cars involved, the days and times of the week when accidents are most likely to happen, and the main causes of accidents. The development of tailored treatments to stop accidents can then be done using this information.

Maps depicting accident hotspots, in addition to statistical analysis, can aid in identifying regions with a high incidence of accidents. This can help prioritize road safety measures in these regions, such as better lighting or road signage.

Last but not least, thorough examination of individual accidents might yield insightful information on the precise elements that caused the disaster. This can assist in identifying places where road infrastructure, vehicle safety, and emergency response systems need to be improved.

In general, studying Indian traffic accidents is a crucial step towards increasing

traffic safety and lowering the number of fatalities and injuries brought on by traffic accidents.

Methodology:

The following phases can be used to split the approach for statistical analysis of road accidents in India:

1.) Data gathering: The first stage is to gather information about traffic incidents in India. Numerous sources, including the police, governmental organizations, and insurance firms, can provide this information.

2.) Data preparation: After the data have been gathered, they must be prepared and cleansed. This entails cleaning up any mistakes or discrepancies in the data and making sure it's in an analytically-friendly manner.

3.) Data analysis: The next step is to analyze the data. This can be done using a variety of statistical methods, such as descriptive statistics, inferential statistics, and time series analysis.

4.) Results interpretation: Interpreting the analysis' findings is the last stage. Making inferences from the data and suggestions for enhancing road safety in India are included in this.

Here are some of the factors that can be considered in the statistical analysis of road accidents in India:

(a.) The most fundamental indicator of road safety is the quantity of accidents. It can be determined by tallying the number of accidents that happen on the roads in a particular year.

(b.) The number of people killed or hurt in traffic accidents is as follows: This is just another crucial indicator of driving safety.

(c.) The number of people killed or wounded in auto accidents within a specific year can be used to calculate it.The seriousness of traffic accidents The number of people killed or injured in each traffic accident can be used to quantify this.

(d.) The elements that contribute to accidents, such as driver mistake, vehicle flaws, and poor road conditions, can be used to identify the causes of traffic accidents.

(e.) The time of day and day of the week that accidents on the road happen: This information can be used to determine when accidents are more likely to happen.

(f.) accident locations can be used to pinpoint regions where they are more likely to happen.

(g.) The weather at the time of incidents on the road: This can be used to detect weather conditions that are connected to accidents on the road.

(h.) It is possible to determine which vehicles are more likely to be involved in accidents on the road by looking at their kind.

(i.) The age and gender of the drivers involved in crashes: This information can be used to determine which drivers are more likely to be in crashes.

(j.) Road accident drivers' usage of alcohol or drugs: This can be used to identify drivers who are more likely to be involved in crashes if they are impaired by either substance.

By analyzing this data, it is possible to identify trends and patterns in road accidents in India. This information can then be used to develop strategies and interventions to improve road safety.

Analysis and Result:

Descriptive Data Analysis: Since there was only one type of data, bar graphs were employed to describe the sample data. The bar graph unmistakably displayed the highest number of individuals hurt or killed in traffic accidents between 2014 and 2017. It is disappointing to see how nearly identical the graphs are for each year. This demonstrates how the trend held steady over the course of four years.

Road accidents that result in fatalities are more common in the south, north, and west. Road accidents that result in injuries are more common in the south. Let's look at state-by-state counts in the Southern Zone.

Most fatal accidents that resulted in fatalities took place in good weather or under clear skies. In 2016, there were about 38k accidents where fatalities occurred in clear weather. It is obvious that we won't encounter weather conditions like "hail or snow" because we are gazing at the southern zone. The graph indicates that rainy/cloudy weather is most often. Let's search for injuries similarly. The X axis or feature differences won't be significant.

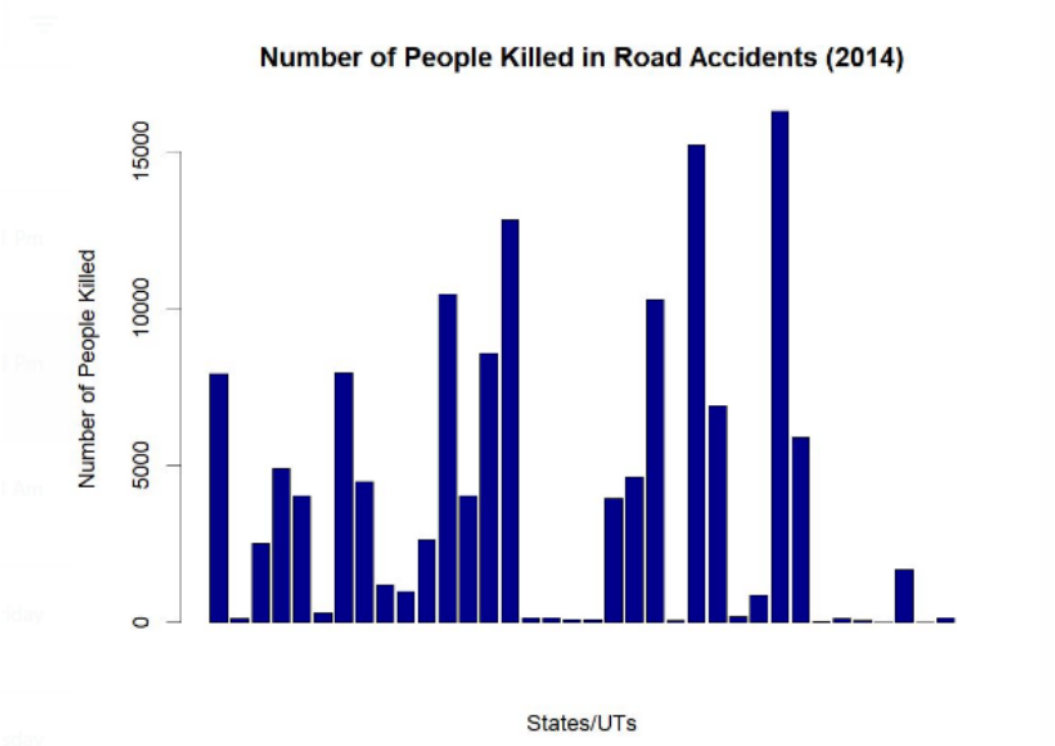
Poor weather (1.7%), defective automobiles (2.3%), and municipal body negligence (2.8%) all contribute to fewer accidents.

Conclusion:

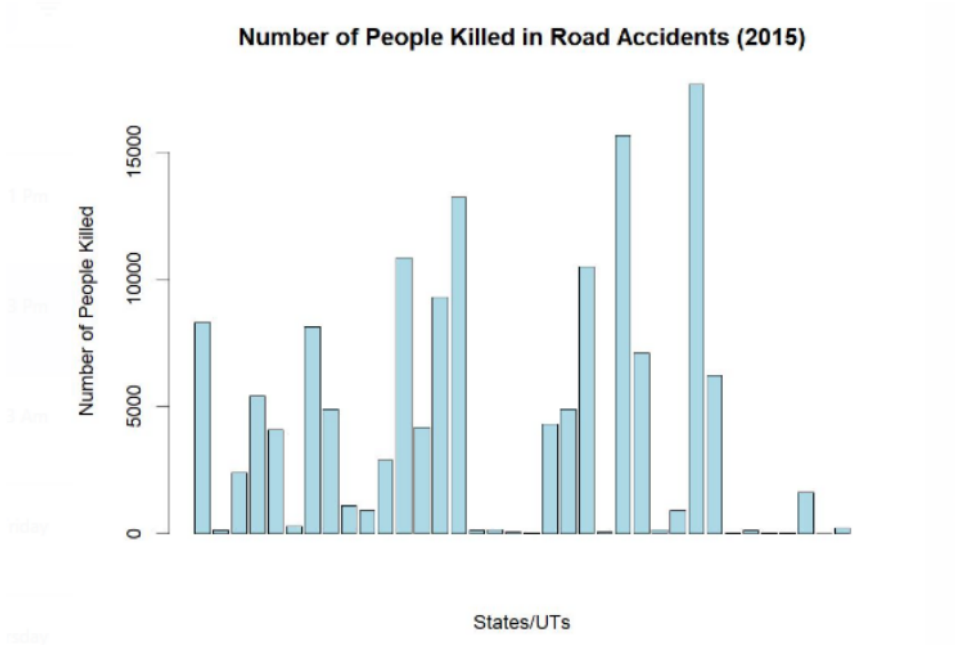
In conclusion, a number of significant conclusions have been drawn from the statistical analysis of road accidents in India. First, India is experiencing an alarming rise in the number of traffic accidents. Second, human error, such as speeding, intoxicated driving, and distracted driving, is to blame for the vast majority of traffic accidents. Thirdly, the lives of victims and their families are severely affected by traffic accidents. Fourth, a variety of practical steps can be taken to lower the number of traffic accidents in India, including enhancing road infrastructure, enforcing traffic regulations, and instructing drivers in safe driving techniques.

It's crucial to remember that the statistical study of traffic accidents in India is only the beginning. More investigation is required to pinpoint the precise causes of the nation's road accidents and to create workable solutions to lower the accident rate. However, the results of the statistical analysis offer a useful framework for further study and the creation of successful road safety regulations in India.

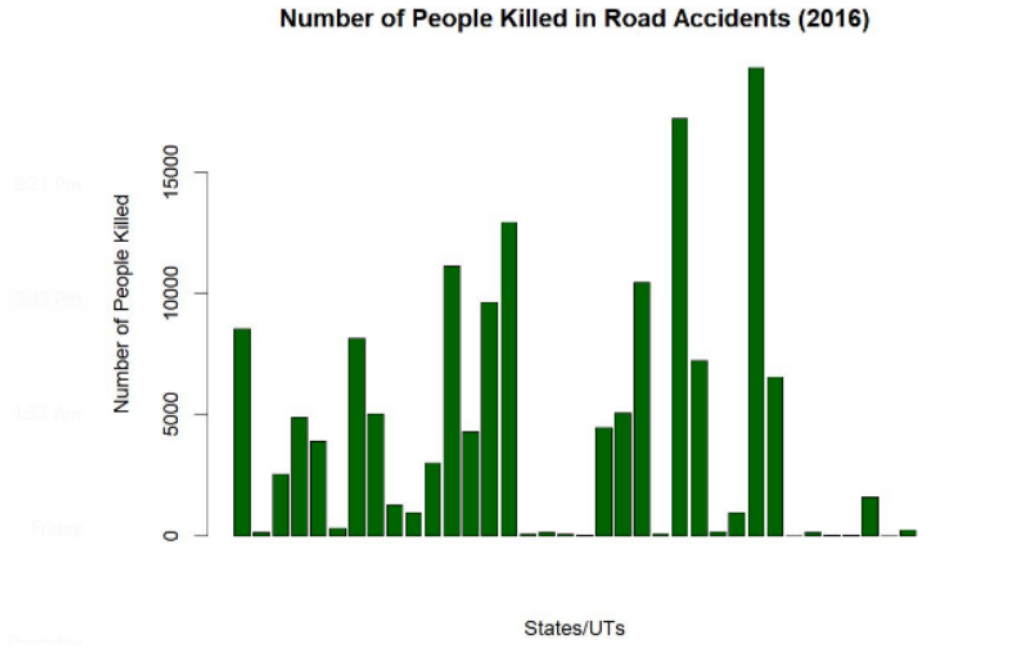
Result 1: Number of people killed in Road Accidents (2014)



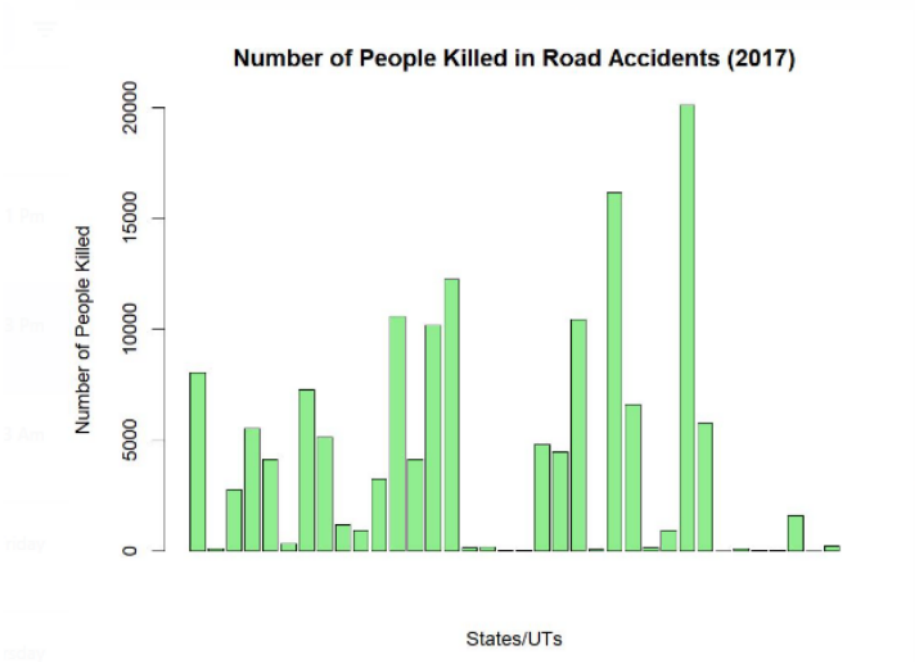
Result 2: Number of people killed in Road Accidents (2015)



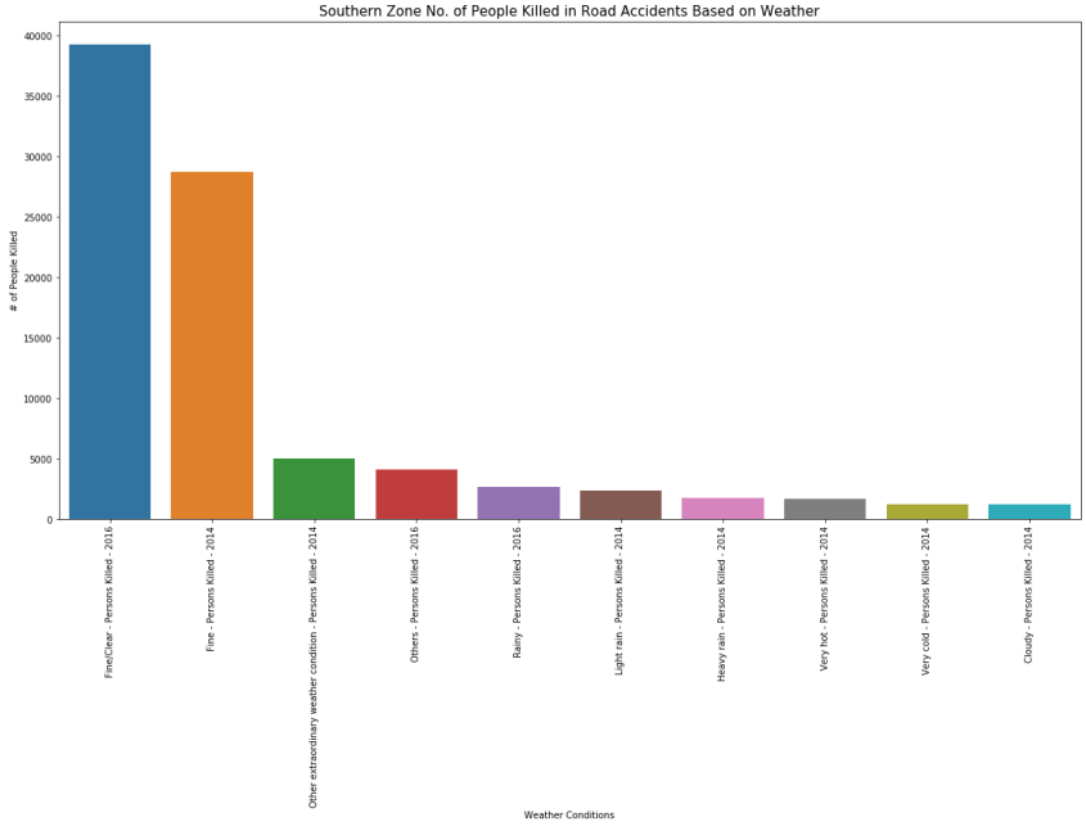
Result 3: Number of people killed in Road Accidents (2016)

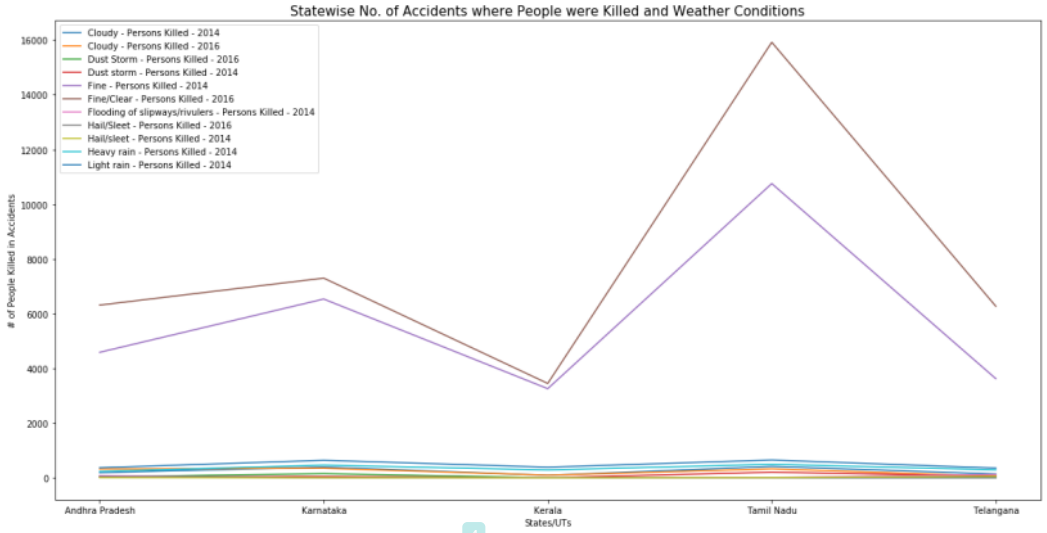


Result 4: Number of people killed in Road Accidents (2017)

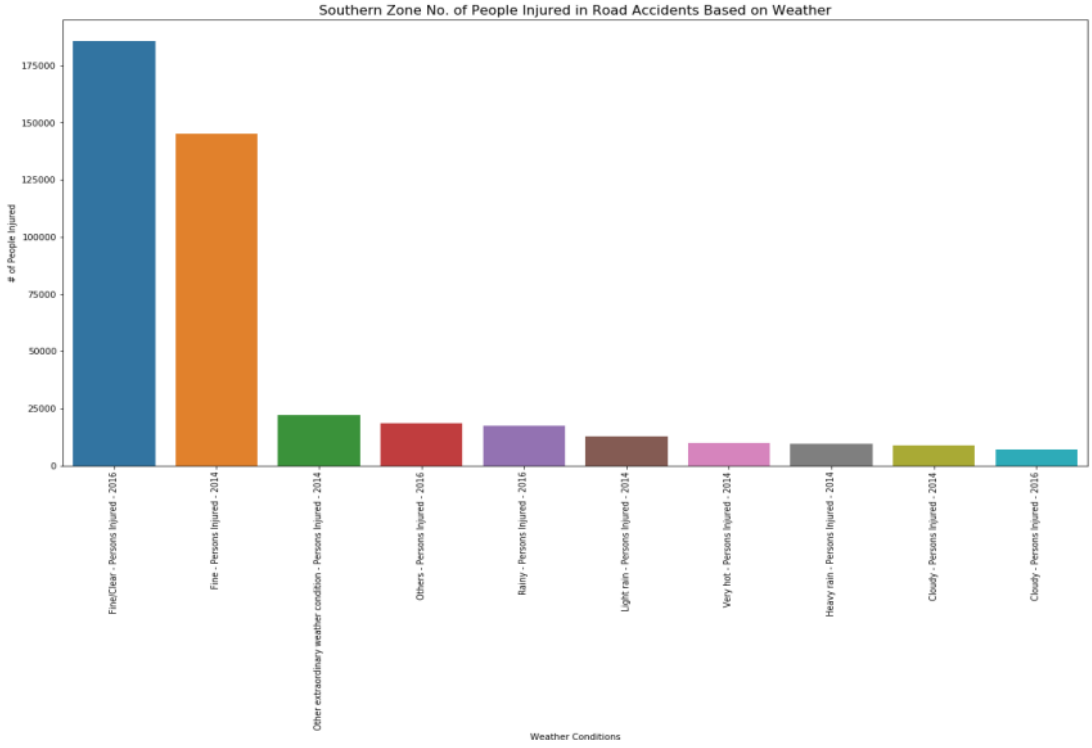


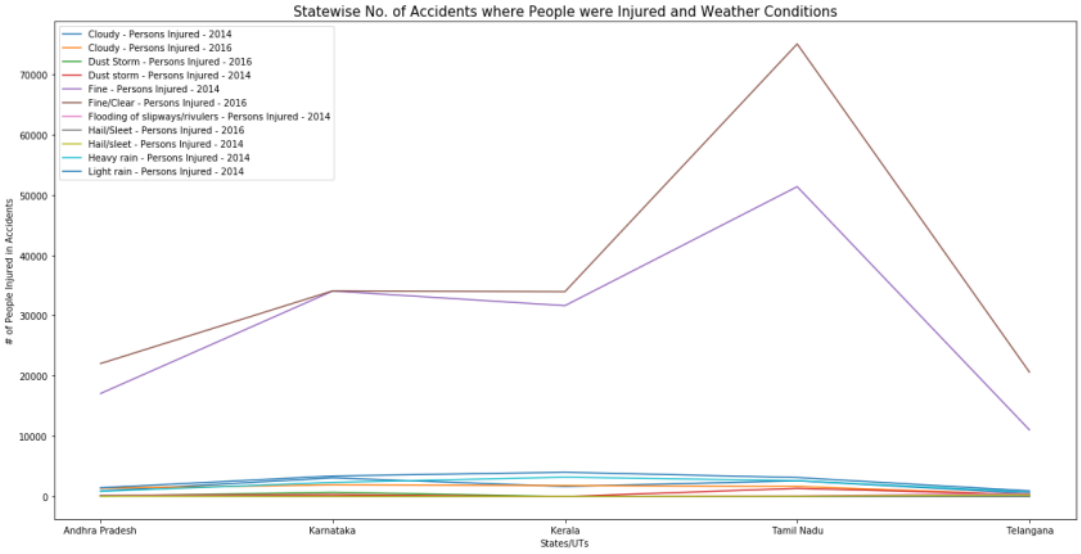
Result 5: Weather Conditions - No. of People Killed in Road Accidents (South Zone)





Result 6: Weather Conditions - No. of People Injured in Road Accidents (South Zone)




Statewise No. of Accidents where People were Injured and Weather Conditions
Cloudy - Persons Injured - 2014
Cloudy - Persons Injured - 2016
Dust Storm - Persons Injured - 2016
Dust storm - Persons Injured - 2014
Fine - Persons Injured - 2014
Fine/Clear - Persons Injured - 2016
Flooding of slipways/rivulers - Persons Injured - 2014
Hail/Sleet - Persons Injured - 2016
Hail/sleet - Persons Injured - 2014
Heavy rain - Persons Injured - 2014
Light rain - Persons Injured - 2014
# of People Injured in Accidents
70000
60000
50000
40000
30000
20000
10000
0
Andhra Pradesh
Karnataka
Kerala
Tamil Nadu
Telangana
States/UTs

MFE-2 Project Report

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