



SHREYA GOYAL

# DATA ANALYSIS: AUTOMOBILE COLLISION SEVERITY



## AGENDA

- INTRODUCTION
- DATA
- METHODOLOGY
- RESULTS
- DISCUSSION
- CONCLUSION



# INTRODUCTION

- Question: How to determine accident severity (1 or 2) based on different variables in the dataset such as d conditions, weather, incident time, and vehicle conditions?
- Audience: Traffice Police and Marketing Campaigns to help save lives
- Goal: Interpret & Analyze real-time data to improvise decision making while driving automobiles

# DATA

- Collision data available from Seattle Department of Transport
- Contains 37 attributes and more than 19000+ cases reported
- Covers 2004 to 2020
- Attributes include Location, Incident Time, Road and Weather conditions, etc.

# METHODOLOGY

- Data Cleaning:
  - Excluded: geographic information, empty columns, and hard to analyze data
  - Included: Address Type, Weather, Road Conditions, Light Conditions, Day of the Week
- Data Preparation:
  - One hot-encoding translation of variables to analyze binary impact and help in classification

# TECHNIQUES

- Deployed supervised Machine Learning in Pandas Python
  - K-Nearest Neighbors
  - Decision Tree
  - Support Vector Machine
  - Logistic Regression

# RESULTS

- Based on accuracy evaluation on test size on all data, logistic regression seems the **ittest**.
- Lowest accuracy with SVM
- Limited training size to 5% for faster memory processing and more random test data for fitting of the analysis

# DISCUSSION

- 70% accuracy achieved by ML techniques in predicting severity of an accident in the future
- (+) Maintaining dry, good lighting, and sunny weather conditions best minimize the risk of accident
- (-) Training on more data could allow for a more precise evaluation



# CONCLUSION

- ML helps achieve accuracy
- 70% accurate-predictive model based on logistic regression
- Allows better public safety
- Opportunity to improve analysis using stronger, more efficient data analysis softwares and experimenting with specific geospatial data





“With automobiles - Better safe than sorry.”

THANK YOU!

