

# IBM Data Science Capstone Project

Predict the Accident severity for  
vehicle GPS

```
for object to mirror_mod.mirror_object
operation == "MIRROR_X":
    mirror_mod.use_x = True
    mirror_mod.use_y = False
    mirror_mod.use_z = False
operation == "MIRROR_Y":
    mirror_mod.use_x = False
    mirror_mod.use_y = True
    mirror_mod.use_z = False
operation == "MIRROR_Z":
    mirror_mod.use_x = False
    mirror_mod.use_y = False
    mirror_mod.use_z = True

#selection at the end -add
mirror_ob.select= 1
modifier_ob.select=1
context.scene.objects.active
("Selected" + str(modifier_ob.name))
mirror_ob.select = 0
= bpy.context.selected_objects
data.objects[one.name].select

print("please select exactly 1")

-- OPERATOR CLASSES -----

bpy.types.Operator):
    X mirror to the selected
    object.mirror_mirror_x"
    mirror X"
```

# Introduction




- Increasing demand for GPS navigation
- GPS to predict accident severity and find safest route
- Use machine learning to build prediction model



# Data

- Collision data in Seattle
- Target: Severity code
- Independent: Location, road condition, weather, junction type, etc.



G I S W E B

ArcGIS Metadata Form

## Collisions—All Years

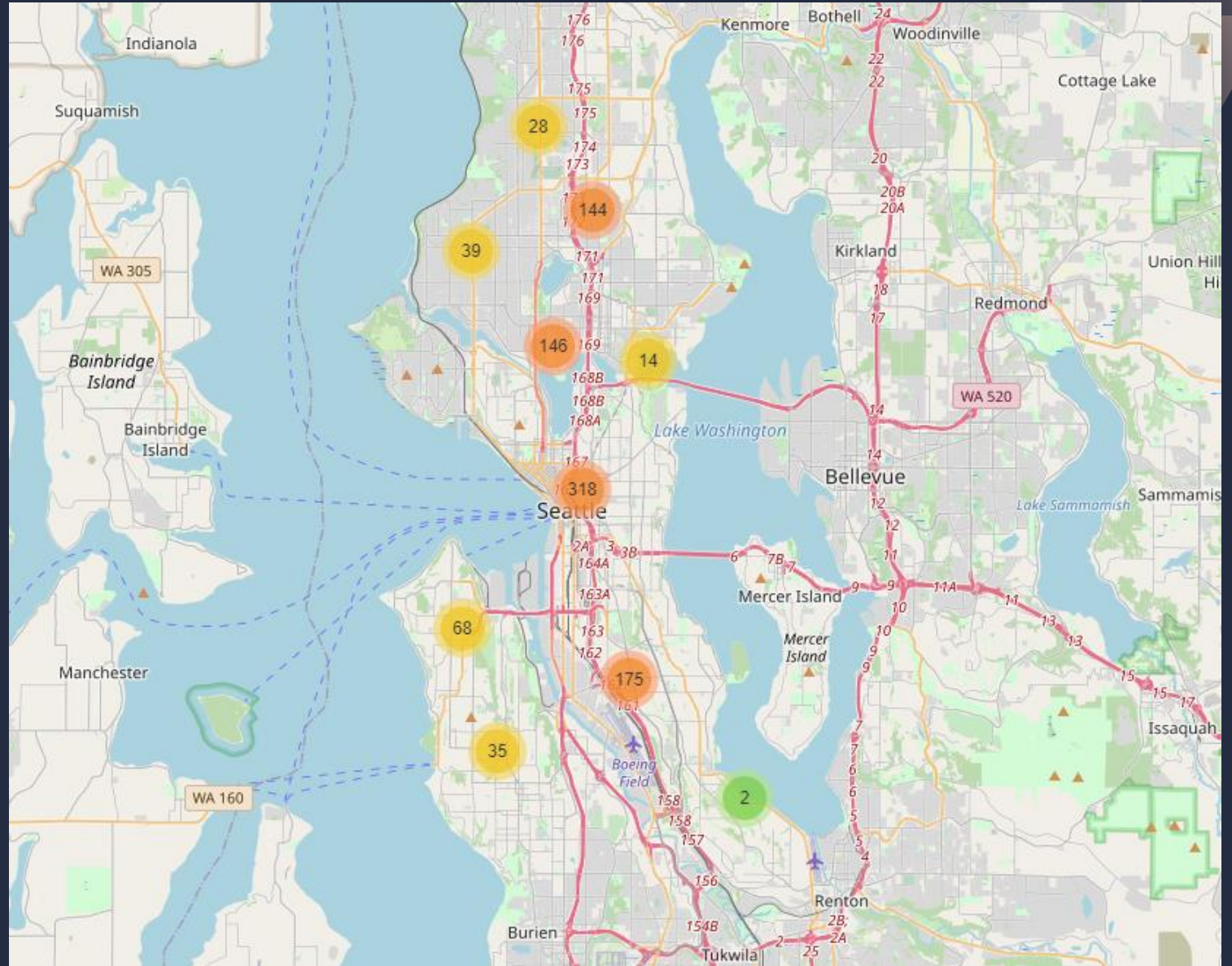
### Data Set Summary

<i>Data Set Basics</i>	
<b>Title</b>	Collisions—All Years
<b>Abstract</b>	All collisions provided by SPD and recorded by Traffic Records.
<b>Description</b>	This includes all types of collisions. Collisions will display at the intersection or mid-block of a segment. Timeframe: 2004 to Present.
<b>Supplemental Information</b>	
<b>Update Frequency</b>	Weekly
<b>Keyword(s)</b>	SDOT, Seattle, Transportation, Accidents, Bicycle, Car, Collisions, Pedestrian, Traffic, Vehicle
<i>Contact Information</i>	
<b>Contact Organization</b>	SDOT Traffic Management Division, Traffic Records Group
<b>Contact Person</b>	SDOT GIS Analyst
<b>Contact Email</b>	DOT_IT_GIS@seattle.gov



# Data Seattle collisions

- Frequent collisions along the highway

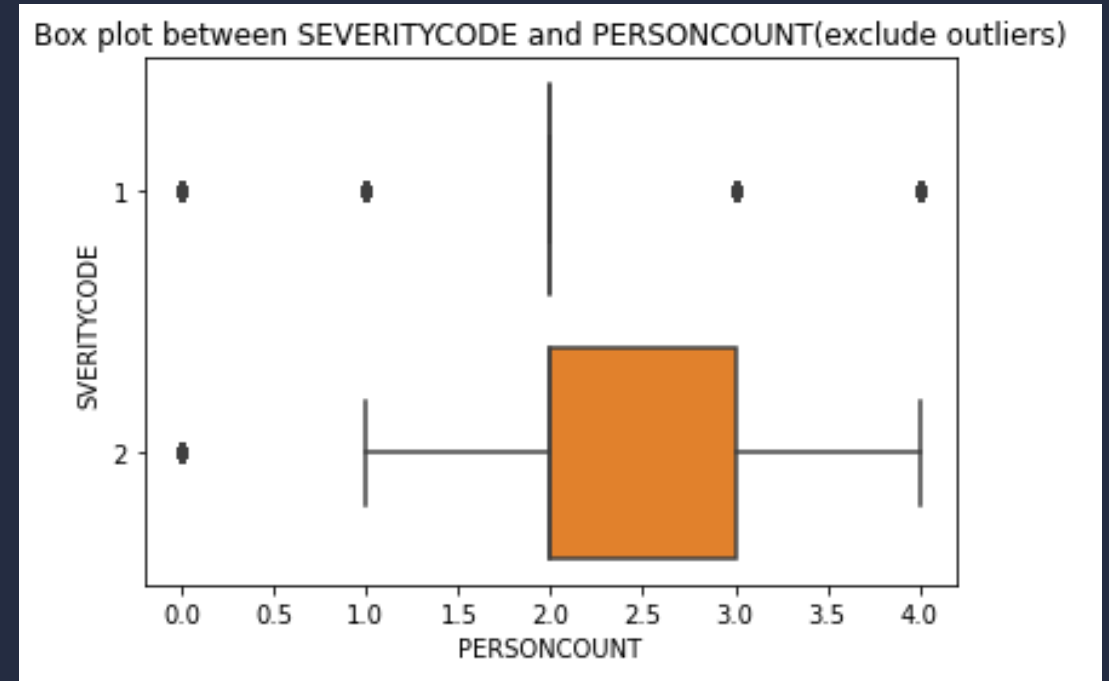
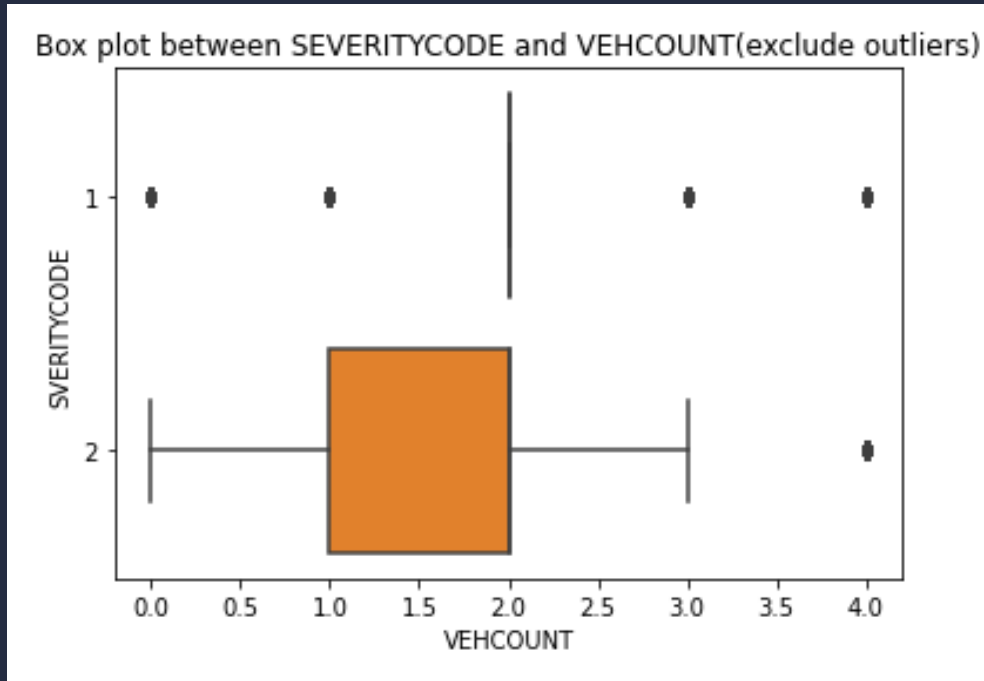


# Methodology

## Dataset preparation

	SEVERITYCODE	PERSONCOUNT	VEHCOUNT	ROADCOND	WEATHER	JUNCTIONTYPE	SPEEDING	LIGHTCOND
0	2	2	2	Wet	Overcast	At Intersection (intersection related)	NaN	Daylight
1	1	2	2	Wet	Raining	Mid-Block (not related to intersection)	NaN	Dark - Street Lights On
2	1	4	3	Dry	Overcast	Mid-Block (not related to intersection)	NaN	Daylight
3	1	3	3	Dry	Clear	Mid-Block (not related to intersection)	NaN	Daylight
4	2	2	2	Wet	Raining	At Intersection (intersection related)	NaN	Daylight





# Methodology

## Data analysis

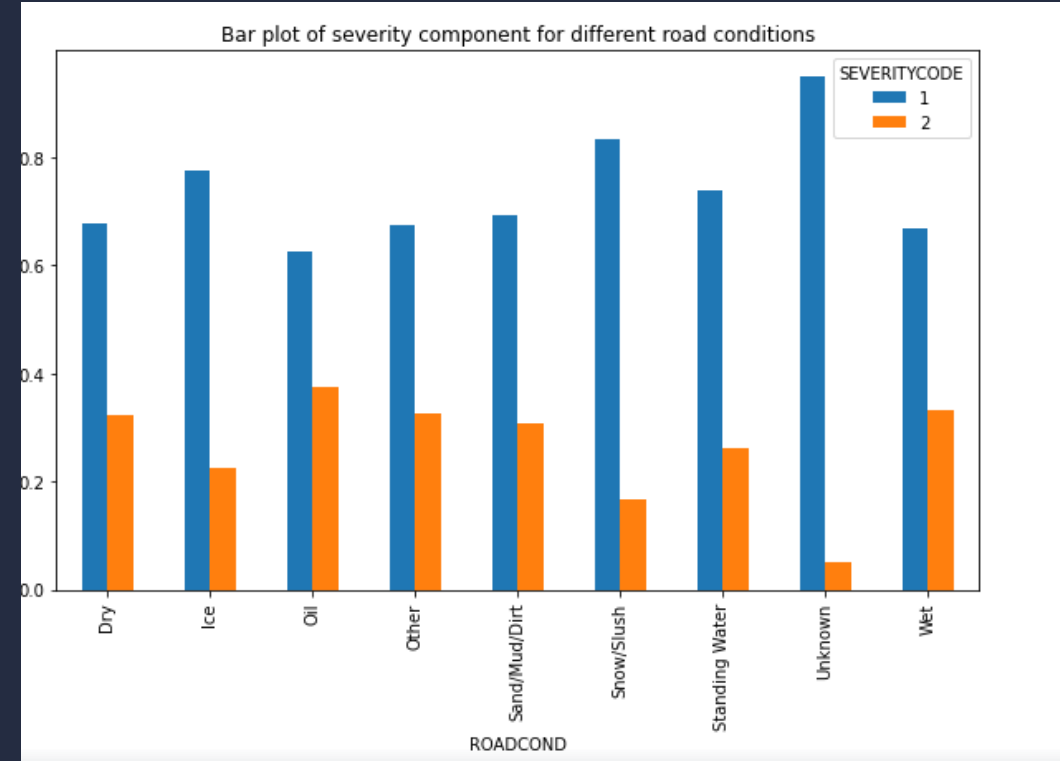
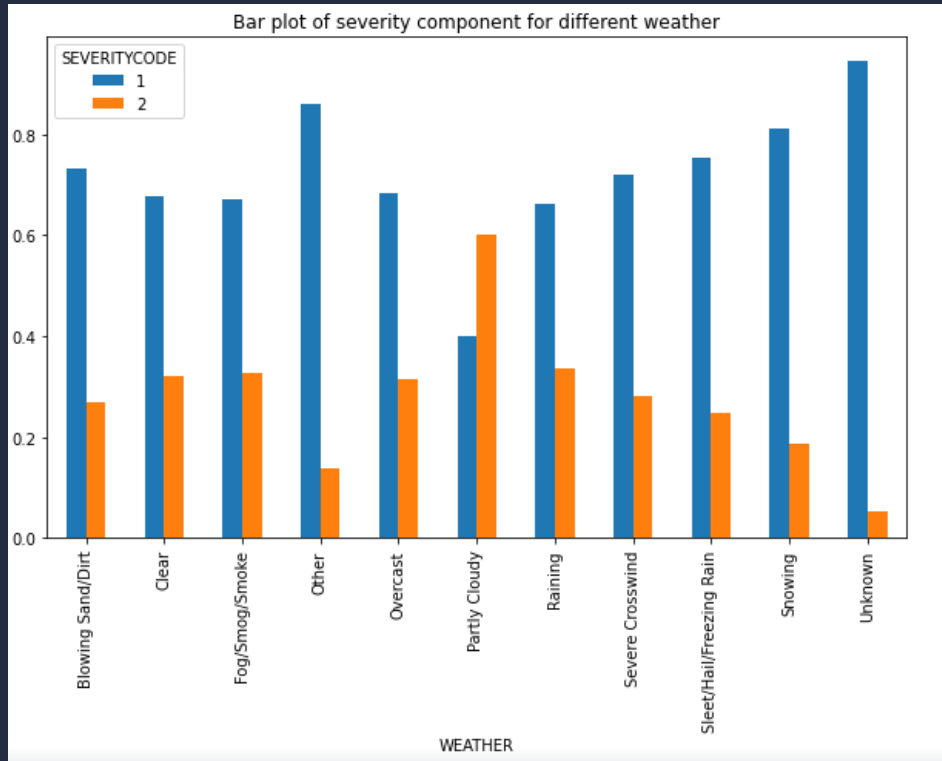
- Analysis numerical independent variables: vehicle count, person count

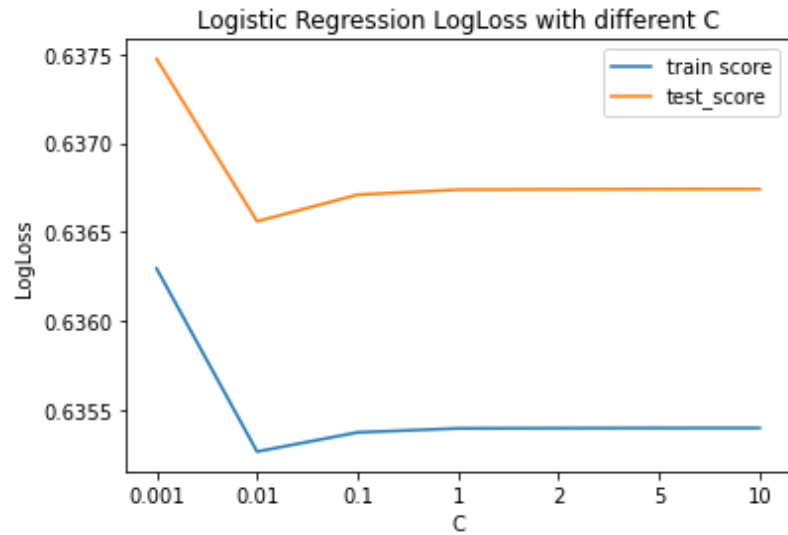


# Methodology

## Data analysis

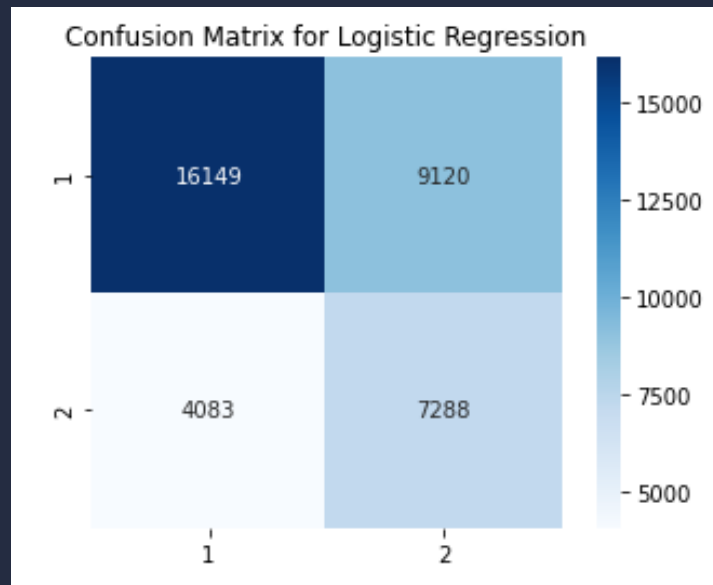
- Deal with categorical variables



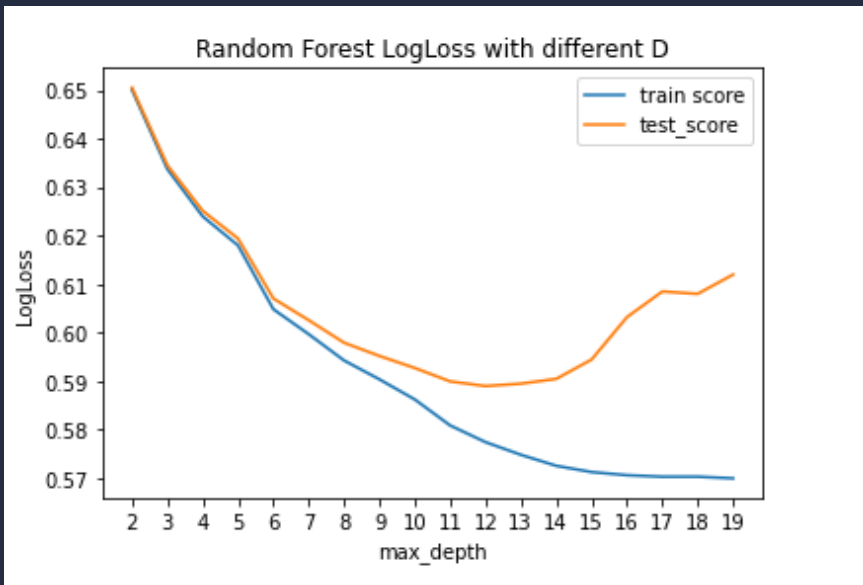


# Model and Evaluation

## Logistic Regression

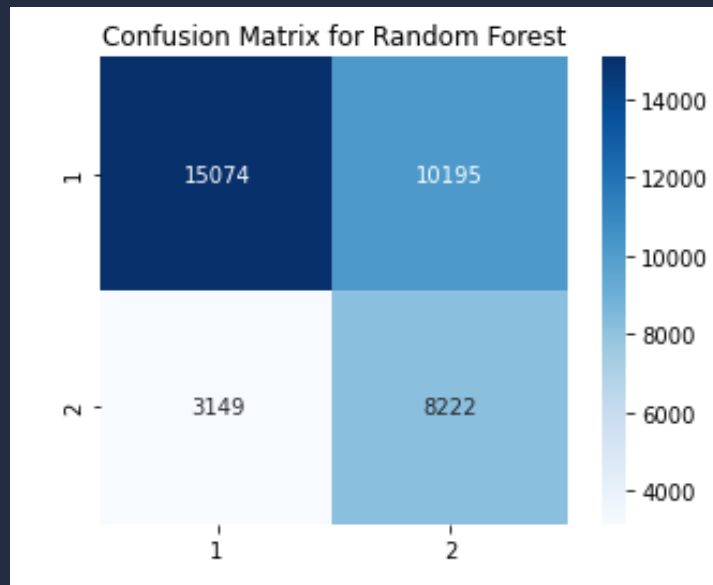






# Model and Evaluation

## Random Forest



# Conclusion

- Developed machine learning models to predict the accident severity and the corresponding possibility
- More potentials to be explored further
- Consider weights on type II errors

