Introduction | Business Undertanding

In an effort to reduce the frequency of car collisions in a community, an algorithim must be developed to predict the severity of an accident given the current weather, road and visibility conditions. When conditions are bad, this model will alert drivers to remind them to be more careful.

## Data Understanding

Our predictor or target variable will be 'SEVERITYCODE' because it is used measure the severity of an accident from 0 to 5 within the dataset. Attributes used to weigh the severity of an accident are 'WEATHER', 'ROADCOND' and 'LIGHTCOND'.

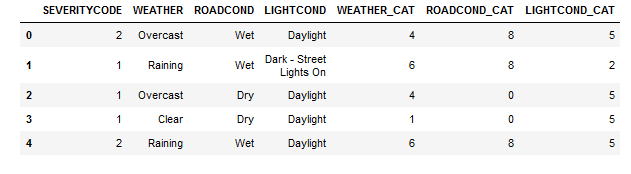
Severity codes are as follows:

1. : Little to no Probability (Clear Conditions)
2. : Very Low Probablility - Chance or Property Damage
3. : Low Probability - Chance of Injury
4. :Mild Probability - Chance of Serious Injury
5. :High Probability - Chance of Fatality

### **Extract Dataset & Convert**

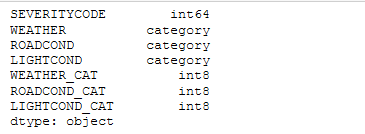
In it's original form, this data is not fit for analysis. For one, there are many columns that we will not use for this model. Also, most of the features are of type object, when they should be numerical type.

We must use label encoding to covert the features to our desired data type.

[](https://res.cloudinary.com/practicaldev/image/fetch/s--chHdQUzJ--/c_limit%2Cf_auto%2Cfl_progressive%2Cq_auto%2Cw_880/https:/dev-to-uploads.s3.amazonaws.com/i/icadxir8nc4agrh2mv49.png)

With the new columns, we can now use this data in our analysis and ML models!

Now let's check the data types of the new columns in our dataframe. Moving forward, we will only use the new columns for our analysis.

[](https://res.cloudinary.com/practicaldev/image/fetch/s--Z-rqpa6U--/c_limit%2Cf_auto%2Cfl_progressive%2Cq_auto%2Cw_880/https:/dev-to-uploads.s3.amazonaws.com/i/ho4kty0dz8gyqkvx170w.png)

#### Balancing the Dataset

Our target variable SEVERITYCODE is only 42% balanced. In fact, severitycode in class 1 is nearly three times the size of class 2.

We can fix this by downsampling the majority class.

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Perfectly balanced.