|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Y** | **X** |  | **Significance at** | **Residual Deviance** | **AIC** | **Overall Interpretation** |
| 1 | Count\_Crashes | X1:  Involving\_Drink Driving | 4.67-2.0X1 | Yes | 42047 on 184 degrees of freedom | 42804 | the model suggests that Involving Drinking Driving is a significant predictor of the count of crashes, and that the model explains some but not all of the variability in the count of crashes |
| 2 | Count\_Crashes | X1: Involving\_Driver\_Speed | 4.65-2.5 X1 | Yes | 42047 on 184 degrees of freedom | 42804 | the model suggests that Involving Driver Speed is a significant predictor of the count of crashes, and that the model explains some but not all of the variability in the count of crashes |
| 3 | Count\_Crashes | X1: Involving\_Fatigued\_Driver | 4.49-2.5 X1 | Yes | 44153 on 184 degrees of freedom | 44911 | the model suggests that Involving Fatigued Driver is a significant predictor of the count of crashes, and that the model explains some but not all of the variability in the count of crashes |
| 4 | Count\_Crashes | X1: Involving\_Defective\_Vehicle | 4.50-2.8 X1 | Yes | 43770 on 184 degrees of freedom | 44527 | the model suggests that Involving Defective Vehicle is a significant predictor of the count of crashes, and that the model explains some but not all of the variability in the count of crashes |
| 5 | Count\_Crashes | X1:  Involving\_Drink Driving  X2: Involving\_Driver\_Speed  X3: Involving\_Fatigued\_Driver  X4: Involving\_Defective\_Vehicle | 6.00-2.4 X1-3.1 X2-3.6 X3-3.8 X4 | Yes | 14214 on 184 degrees of freedom | 14977 | the model suggests that the linear relationship between the combination of four variables and the occurrence of car accidents. When the occurrences of the four situations are low, the probability of a car accident is also low. However, as these situations increase, the probability of a car accident also increases. There is a linear relationship between these situations and the number of car accidents, as shown by the red line in the graph |
|  | | | | | | | |
| 1 | Count all casualties | X1:  Involving\_Drink Driving | 4.9-1.9 X1 | Yes | 55241 on 184 degrees of freedom | 56053 | the model suggests that Involving Drinking Driving is a significant predictor of the count all casualties, and that the model explains some but not all of the variability in the count of crashes |
| 2 | Count all casualties | X1: Involving\_Driver\_Speed | 4.9-2.4 X1 | Yes | 54195 on 184 degrees of freedom | 55008 | the model suggests that Involving Driver Speed is a significant predictor of the count all casualties, and that the model explains some but not all of the variability in the count of crashes |
| 3 | Count all casualties | X1: Involving\_Fatigued\_Driver | 4.7-2.5 X1 | Yes | 58089 on 184 degrees of freedom | 58902 | the model suggests that Involving Fatigued Driver is a significant predictor of the count all casualties, and that the model explains some but not all of the variability in the count of crashes |
| 4 | Count all casualties | X1: Involving\_Defective\_Vehicle | 4.7-2.8 X1 | Yes | 57513 on 184 degrees of freedom | 58326 | the model suggests that Involving Defective Vehicle is a significant predictor of the count all casualties, and that the model explains some but not all of the variability in the count of crashes |
| 5 | Count all casualties | X1:  Involving\_Drink Driving  X2: Involving\_Driver\_Speed  X3: Involving\_Fatigued\_Driver  X4: Involving\_Defective\_Vehicle | 6.2-2.4 X1-3.0 X2-3.6 X3-3.8 X4 | Yes | 18581 on 184 degrees of freedom | 19399 | the model suggests that the linear relationship between the combination of four variables and the occurrence of casualties. When the occurrences of the four situations are low, the probability of casualties is also low. However, as these situations increase, the probability of casualties also increases. There is a linear relationship between these situations and the casualties, as shown by the red line in the graph |

The reason for why we use Poisson or not logistic regression in the below:

Poisson regression is primarily used for modeling count data. In our dataset, both the "Crash Count" and "Count all casualties" variables involve counting and accumulation of data, making them more suitable for modeling with count data analysis methods such as Poisson regression. However, logistic regression is more appropriate for analyzing variables with small differences, such as the "average monthly hours" in practical 4 and is not suitable for analyzing count data in our dataset.