**1. Equations of Relationships**

**For Accidents at Track:**

**For Accidents in Station Limits:**

Where:

* β0​ is the intercept (constant term).
* β1​ is the coefficient for the independent variable "No of Accidents".
* ϵ represents the error term.

**2. Coefficient Estimation**

The coefficients (β0​ and β1​) for each equation are estimated using the provided data and the GLM model fitting process in the code. The model summary will provide the estimated values of these coefficients.

**3. Standard Error, z-value, p-value, and Confidence Intervals**

These statistical metrics are derived during the model fitting process and provide insights into the reliability and significance of the coefficients. Here are the general formulas:

**Standard Error (SE) of the Coefficient:**

**z-value:**

**p-value:**

The p-value is derived from the z-value using the standard normal distribution.

**Confidence Interval:**

For a 95% confidence level:

**Example Calculation**

Assume the summary output of the model for "Accidents at Track" is:

coef std err z P>|z| [0.025 0.975]

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const -0.6812 0.578 -1.179 0.238 -1.813 0.451

No of accidents 0.0448 0.024 1.841 0.066 -0.003 0.092

The equation for "Accidents at Track" would be:

**Interpretation**

* **Intercept (β0)**: -0.6812
* **Coefficient (β1​)**: 0.0448
* **Standard Error**: 0.024
* **z-value**: 1.841
* **p-value**: 0.066
* **95% Confidence Interval for β1​**: [-0.003, 0.092]

This process is repeated for the "Accidents in Station Limits" dependent variable, resulting in a similar equation and interpretation based on the estimated coefficients and associated statistics.