Project goal: Provide a prediction on the 3 Safety KPIs using data from IOGP (International Oil and Gas Producers) from 2014 to 2023: LTIR (Lost Time Incident Rate), TRIR (Total Recordable Incident Rate) and FAR (Fatal Accident Rate). On the final product you can enter the past data of a companies and get your prevision on the following years.

Target : Insurance companies, companies that want to set their yearly objectives

Database: https://github.com/TheLazyCactus/ML\_Project/blob/main/ML\_Project\_safety.csv

Key definitions:

**TRIR (Total Recordable Incident Rate)**

* A measure of the number of OSHA-recordable injuries per 200,000 work hours.
* Formula: TRIR=(Total Recordable Cases×200,000) / Total Hours Worked
* Used to assess overall workplace safety.

**LTIR (Lost Time Incident Rate)**

* A measure of incidents where an employee was unable to work due to injury.
* Formula: LTIR=(Lost Time Cases×200,000)/Total Hours Worked
* Focuses on the severity of workplace incidents.
* A Lost Time Case is generally defined as an incident where an employee is unable to work for **a full shift or more** due to an injury or illness sustained at work.

**FAR (Fatal Accident Rate)** is a workplace safety metric used to measure the number of **fatalities per 100 million hours worked**. It is commonly used in high-risk industries like construction, oil & gas, and manufacturing to assess safety performance.

**Formula for FAR**

FAR=(Number of Fatalities×100,000,000) / Total Hours Worked)

Results so far:

Model = RandomForestRegressor(n\_estimators=100, random\_state=42)

|  |  |
| --- | --- |
| Cases | Mean absolute error |
| 3 KPIs at the same time | 0.59 |
| Without FAR | 0.35 |
| Without FAR and LTIR | 0.56 |
| Without FAR and TRIR | 0.107 |

Next: Model evaluation, Prediction, cross validation