



Seismic Trends: Data-Driven Earthquake Risk Analysis & Insights

Focus

- To observe how earthquakes vary across different regions and time periods.
- To identify areas that experience frequent or severe earthquake activity.

Goal

- To support better awareness of earthquake-related risks.
- To help in disaster preparedness, planning, and research understanding.

Business Use Case & Impact



Identifies **high-risk seismic zones** using magnitude, depth & frequency patterns



Supports **government disaster planning and preparedness**



Enables **insurance risk assessment** using regional intensity and historical trends



Improves **emergency response readiness** with alert levels & tsunami indicators



Helps **researchers** study seismic behavior, aftershocks & data reliability



Data Collection & Processing



Extraction

Extracted global earthquake data from a **public API using Python**

Collected data for a **multi-year time range**



Cleaning

Performed data cleaning:

- Timestamp conversion
- Handling missing & null values



Engineering

Engineered derived columns for:

- Time-based analysis (year, month, day)
- Severity & depth classification

Storage, Analysis & Visualization

Database & SQL

Stored cleaned data in a **MySQL database**

Used **SQL** to analyze:

- Seismic trends and patterns
- Depth vs magnitude behavior
- Regional risk indicators

Interactive Dashboard

Built an **interactive Streamlit dashboard** to visualize insights



Skills & Conclusion

Technical & Analytical Skills



Python & Pandas

API data retrieval, data preprocessing



SQL & MySQL

Database creation, analytical querying



Streamlit

Interactive dashboards & filtered visualizations



Analytical Skills

EDA, pattern identification, real-world insight generation

Conclusion

- Built a **complete data pipeline** from raw data to insights
- Demonstrated real-world application for disaster management & risk analysis