Sheet 1
Brainstorm

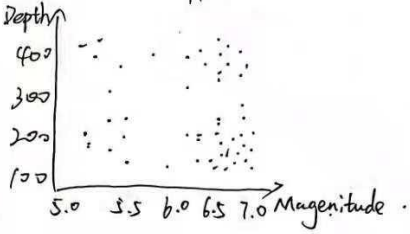
Sheet 1
Xun Du

11-10-2025
34248773

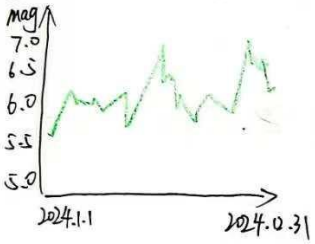
Ideas:

① Proportional Symbol Map

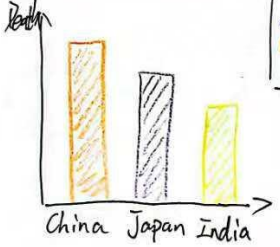
② Scatter Plot.



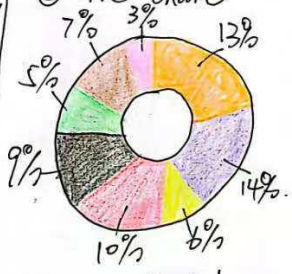
③ Line chart



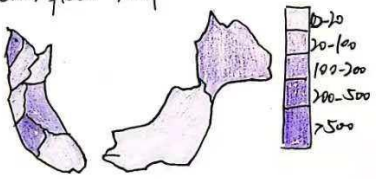
④ Bar Chart



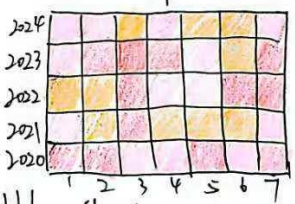
⑤ Pie chart



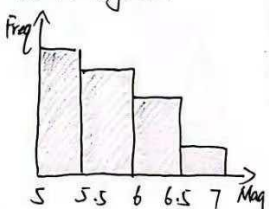
⑥ Choropleth Map



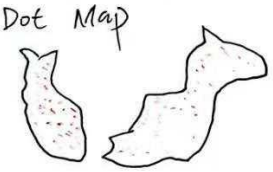
⑦ Heat Map



⑮ Histogram



⑧ Dot Map



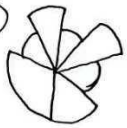
⑨ Bubble Chart

Filter
The Scatter plot ② and Bubble chart ⑨ represent the same insight, can combine them into one chart

Categorize
1. Spatial Distribution: ①, ⑥, ⑧
2. Relationship Analysis: ②, ⑨
3. Time series: ③, ⑦

Combine & Retine
②, ⑨

⑤ Top N

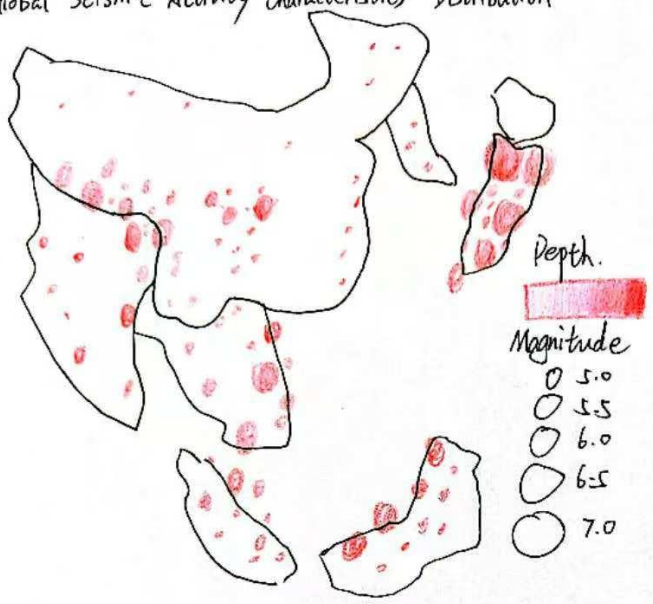


Questions: Does each chart show special insight?
Does the combination of ideas can express the outcome?
Can make effective combination to show valuable conclusion?

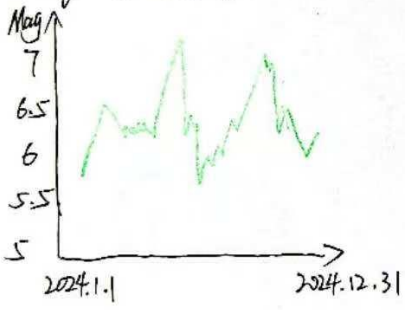
Sheet 2

LAYOUT

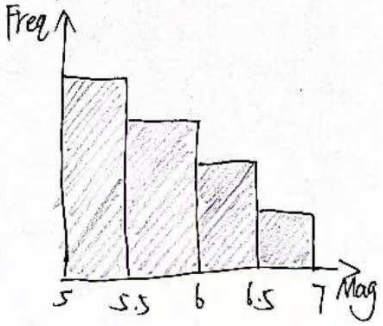
Global Seismic Activity Characteristics Distribution



Seismic Activity Temporal Evolution Sequence Chart.

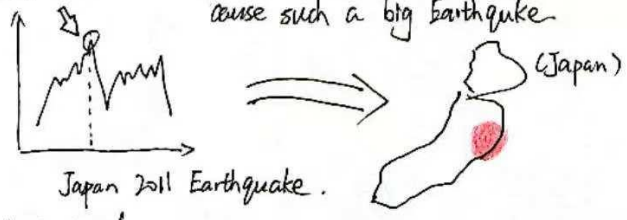


Earthquake Magnitude Frequency Distribution



Focus

Mouse over will show the significant event that cause such a big Earthquke



Japan 2011 Earthquake.

Central Idea:

Show the Earthquake on the map according to the point on line chart to see the event visually.

Title: Global Seismic Activity & Risk Monitor

Author: Xun Du

Date: 11/10/2025

Sheet: 2

operation

- User can select by date range, magnitude, depth and region.
- Click on map points to highlight corresponding events in line chart
- Hover to view event details
- One click to reset to initial dashboard state

Discussion

Advantages:

Combine spatial, temporal and statistical dimensions

Users can discover pattern across multiple views

Enable quick identification of active seismic zone and trends.

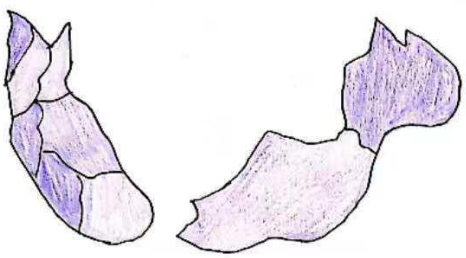
Disadvantages:

Dense earthquake clusters may overlap on the map

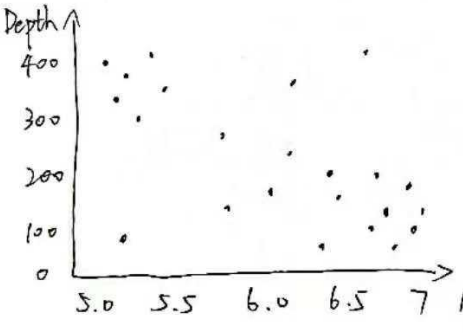
Large magnitude ranges can make small earthquake less visible.

Sheet 3

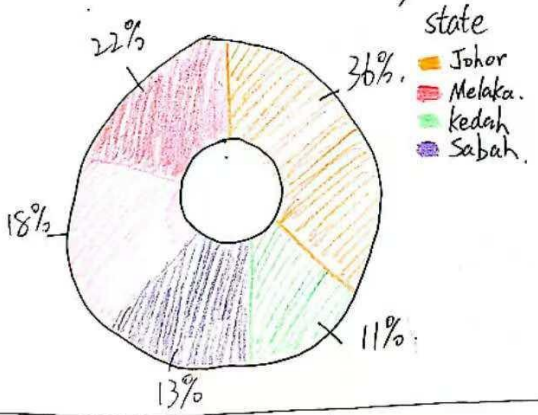
National Earthquake Risk Level



Earthquake Magnitude - Depth Correlation.

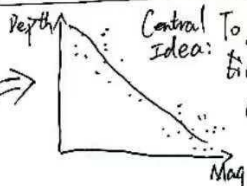


Earthquake Death Distribution by state



Focus

Correlation Analysis Button



Central Idea: To generate a correlation curve in the scatter chart so that make user easy to see the relationship between Depth and Mag.

LAYOUT

Title: Earthquake Impact & Risk Assessment

Author: Xun Du

Date: 11/10/2025

Sheet: 3

Operations

- Cross-Filtering: Click on state in choropleth map to filter scatter and pie chart.
- Brushing: Select points in scatter plot to highlight corresponding segments.
- Hover details: View state statistics, event specifics, and casually breakdown
- Show/hide different risk categories or magnitude ranges

Discussion

Advantages:

Risk pattern identification - Combines geographic distribution with magnitude-depth relationships

Easy to compart state performance

Disadvantages:

Choropleth hides individual details within states

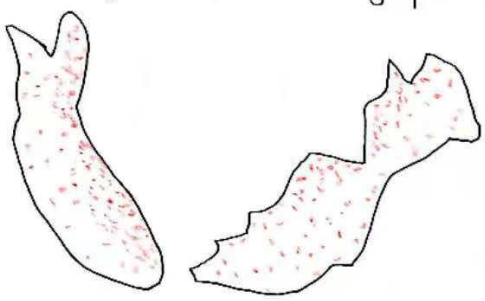
Scatter points may overlap, hiding density patterns.

No time-based analysis in this configuration.

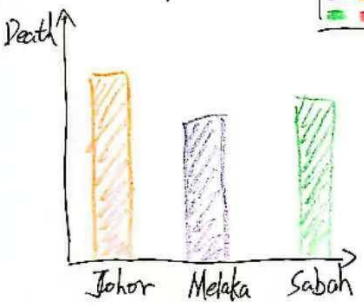
Sheet 4

LAYOUT

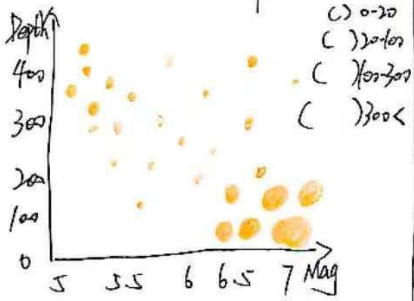
Global Earthquake Disaster Geographic Distribution



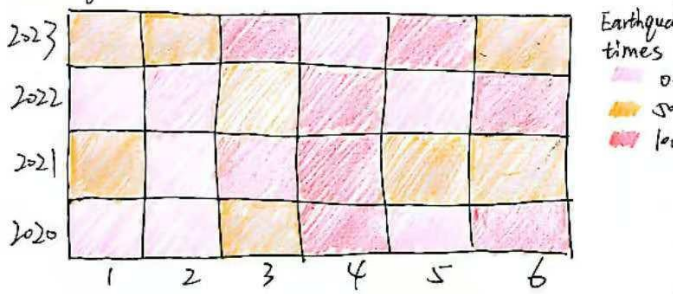
Ranked Bar Chart of Earthquake Death by state.



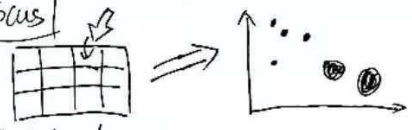
Magnitude-Depth-Casualty 3D Relationship



Earthquake Disaster Year-Month Distribution



Focus



Central Idea:

Click on the specific date, then the Bubble chart will change to that date to show detailed earthquake with its Depth and Magnitude.

Title: Multi-Dimension Seismic Risk & Impact Analyzer

Author: Xun Du

Date: 11/10/2025

Sheet: 4

Operations

- Linked Filtering: Select time range in heatmap to update all other charts
- Focus on specific region in dot map with synchronized updates.
- Click bar chart element to filter by risk Level
- Modify bubble chart metrics.

Discussion

Advantages:

Heat map reveals seasonal trends, dot map shows spatial clusters.

Bar chart enable state comparisons.

From individual events to national trends to temporal patterns.

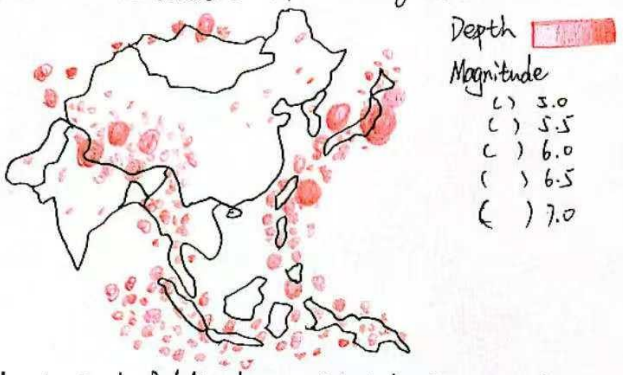
Disadvantages.

Interaction Overhead: User need to learn cross-filter and linking behavior.

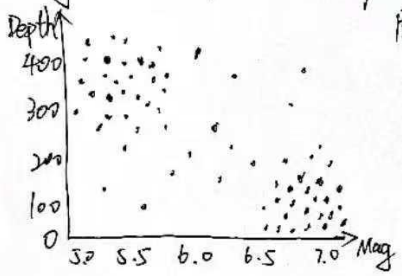
Dot map will suffer overplotting

Sheet 5

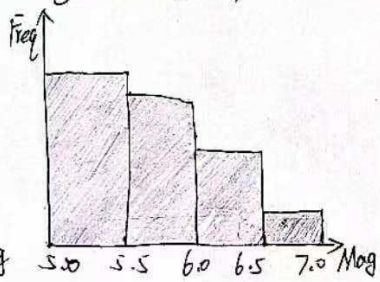
Spatial Distribution of Earthquakes



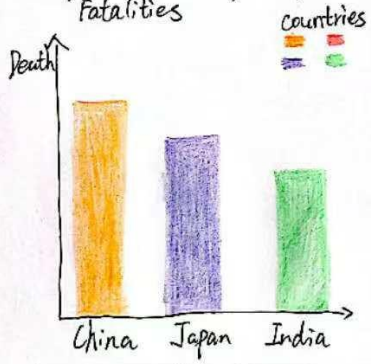
Magnitude Vs Depth Relationship



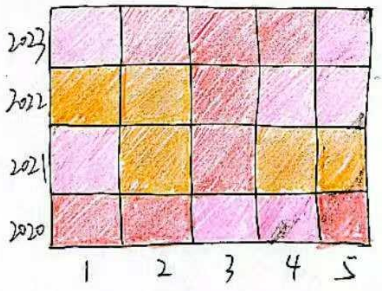
Magnitude Frequency Distribution



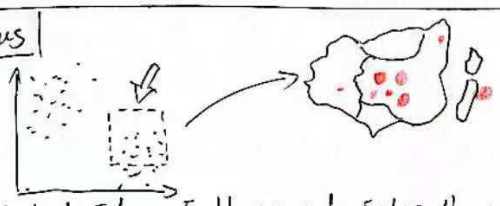
Top 5 Countries by Earthquake Fatalities



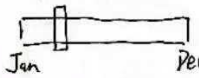
Earthquake Occurance and Impact



Focus



Time Silder



Centrel Idea: Enable users to Explore the spatial-Temporal pattern of Asian Earthquake interactively through brushing and Time Slider

LAYOUT

Title: Seismic Patterns Across Asia: Magnitude, Depth, and Impact

Author: Xun Du

Date: 12/10/2025

Sheet: 5

Operations

- Hover to view detailed earthquake information (tooltip)
- Brush over scatter plot to filter by magnitude and depth range
- Adjust the time slider to observe changes in Earthquake distribution over time.
- Zoom and pan on the map to focus on specific regions.

Disscussion

Algorithms: Data aggregation by time (Month/Year) for trend visualization

Colours: Gradient from light red to dark red.

Heatmap: Sequential colour scale indicating frequency or depth.

Shapes: Circle, Dots, Rectangular

Software: Python, Vega-Lite

Estimate Time:

Map: 3hs Heatmap: 3hs

Scatter plot: 1h Bar: 1h

Histogram: 2hs

Total: Around 10-12hs