University of Passau

6171 Data Visualization

Final Presentation

Group 12
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Oil Production Dataset

Annual Statistics (2021 to 2023) - 36 Countries

Key Columns:

1. country_name: Name of the country
2. type: Type of statistics
3. product: Specification of oil production (e.g., crude, LPG, gasoline and diesel)
4. flow: Oil product movement and distribution (e.g., Net deliveries, consumption pattern
5. year: Year of the production data
6. value: Production value (USD)

Select your data here: [Choose File] 📄 oil_productio...atistics.csv

COUNTRY_NAME	TYPE	PRODUCT	FLOW	YEAR	VALUE
Australia	Balance	Crude oil	Industrial Production	2021	18029.678
Austria	Balance	Crude oil	Industrial Production	2021	561.852
Belgium	Balance	Crude oil	Industrial Production	2021	0
Canada	Balance	Crude oil	Industrial Production	2021	266630.18
Chile	Balance	Crude oil	Industrial Production	2021	340.997

Oil Production Dataset

Annual Statistics (2021 to 2023) - 36 Countries

Applications:

- Analytical Insights: Track variations and trends in oil production across different countries.
- Energy Policy: Inform energy policies and investment decisions.
- Geopolitical Analysis: Explore the impact of geopolitical factors on oil production.
- Sustainability Efforts: Drive sustainable development in the oil sector.

Usage:

- Researchers: Analyze production dynamics and trends.
- Policymakers: Optimize energy strategies and mitigate risks.
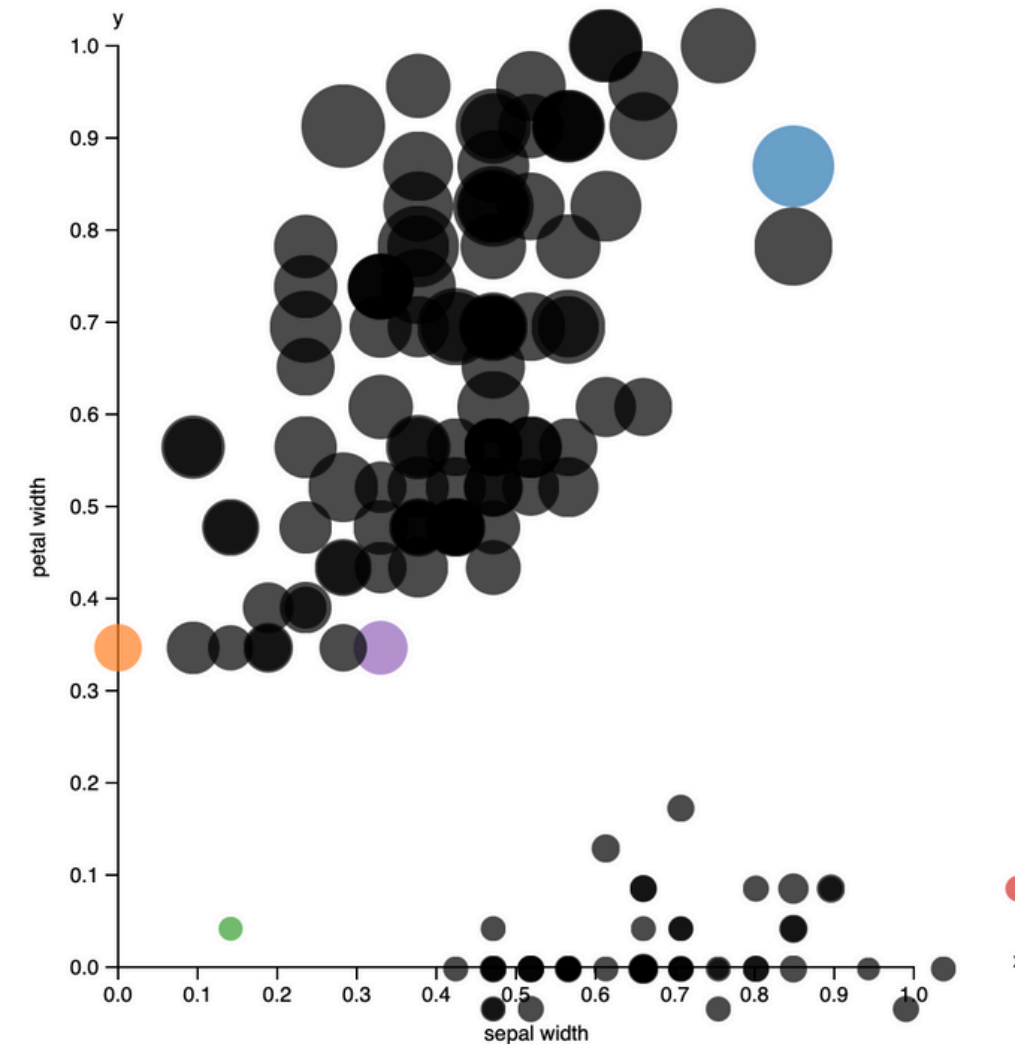- Investors: Make informed investment decisions in the energy sector.

Part–I Basic Visualisation

- ☑ Data loading/preparation
- ☑ Displaying data table
- ☑ Adapting axes
- ☑ Render scatterplot points
- ☑ Scatterplot selection
- ☑ Element Deselection
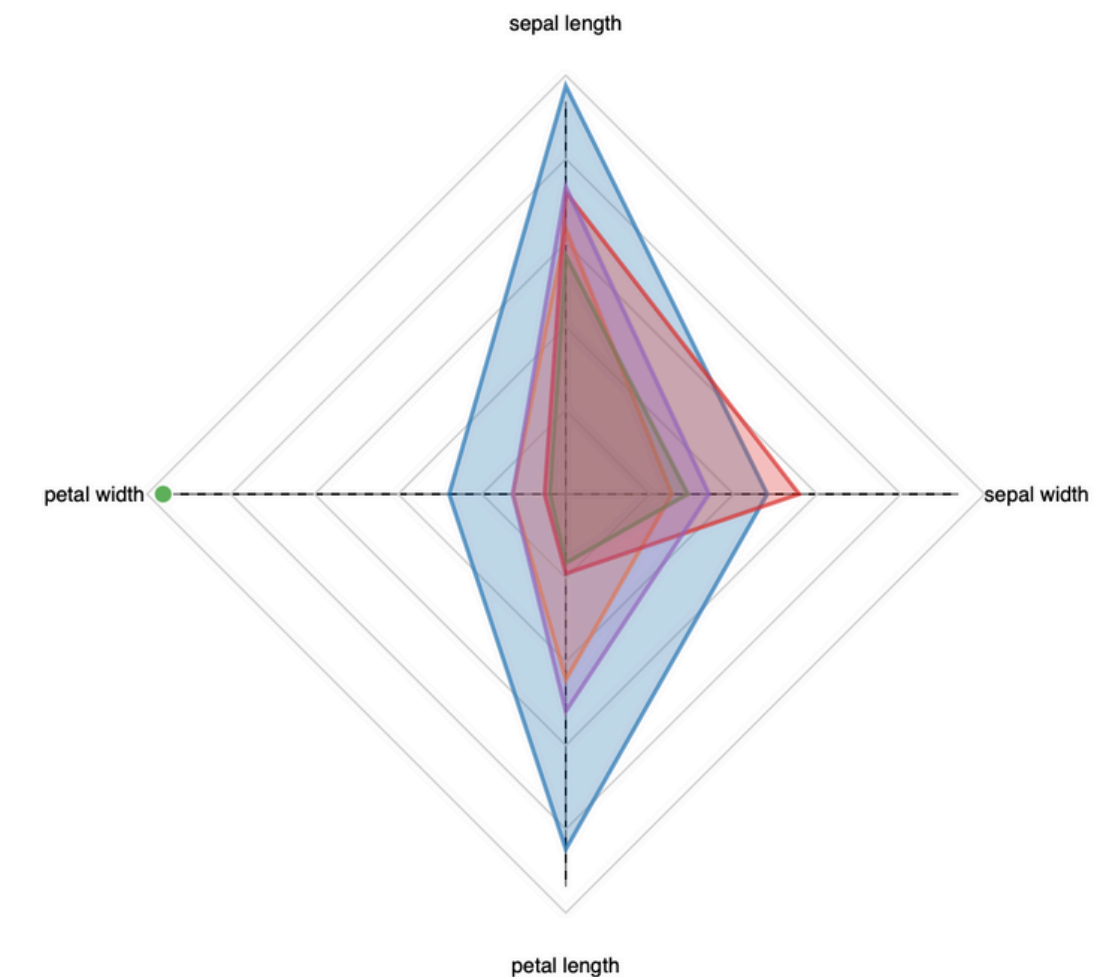- ☑ Radar Chart
- ☑ Animated transitions

Part-2 Dashboard Implementation

☑ Dashboard Concept

☑ Dashboard Implementation

- The dashboard focuses on providing a comprehensive view of global oil production from 2021 to 2023. It includes a **Donut Chart** for annual flow breakdowns, a **Zoomable Bar Chart** for detailed country-specific production analysis, a **Choropleth Map** for a global overview, and a **Line Chart** for tracking production trends by product.

- Interactive linking between charts allows for an in-depth exploration of production dynamics and insights into the contributions and flow distributions of individual countries.

Data Visualization Exercise

Created by Neha Beru for the Data Visualization Lecture at Faculty of Computer Science and Mathematics - Chair of Cognitive sensor systems - University of Passau.

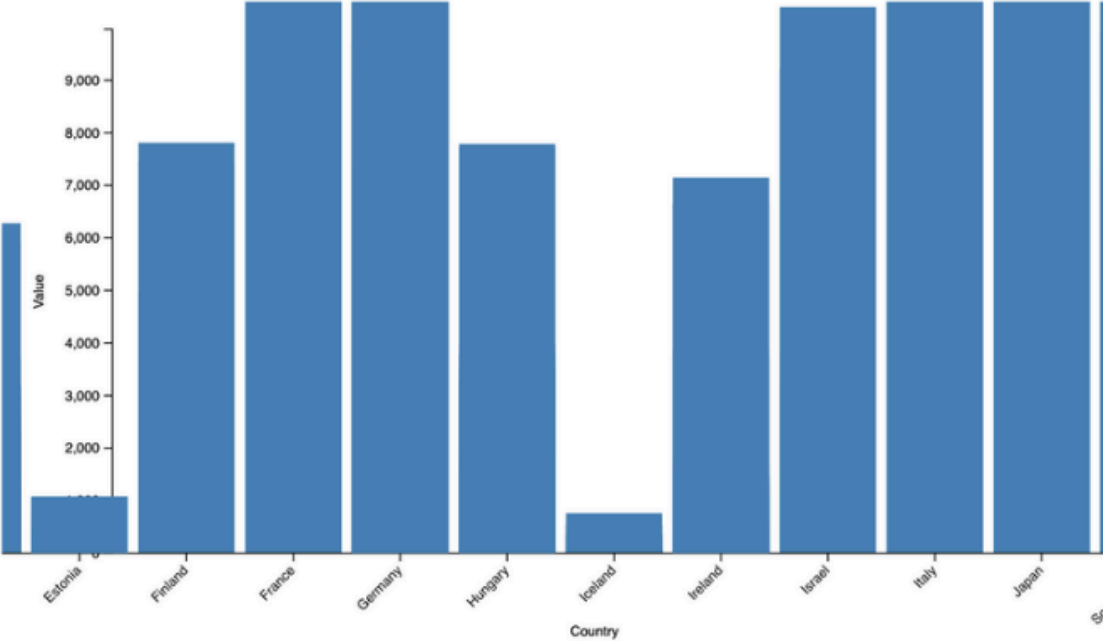## OIL PRODUCTION STATISTICS DASHBOARD

Interactive Donut Chart
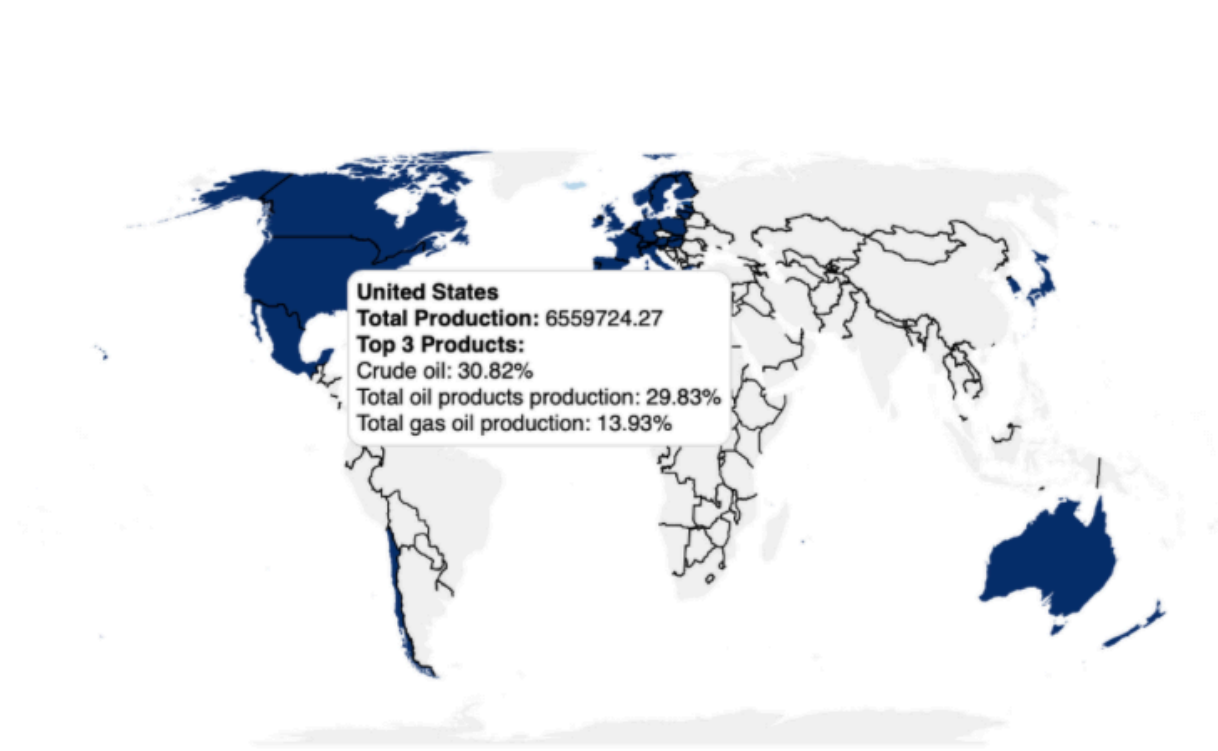
Annual Oil Production by Flow

○ 2021 ○ 2022 ● 2023

Industrial Production
Net Deliveries
Consumption Pattern
Storage Channelization
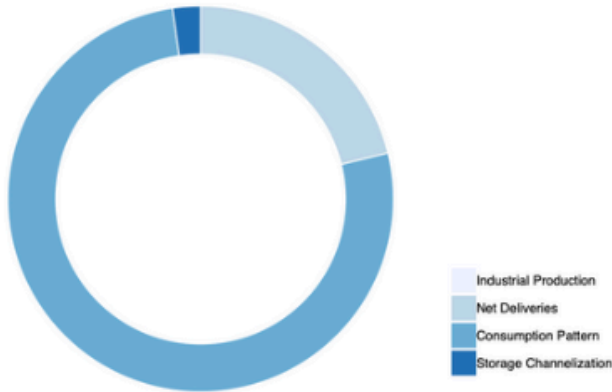
Zoomable Bar chart

Oil Production by Country

Choropleth Map

Global Production Values Over Time

United States
Total Production: 6559724.27
Top 3 Products:
Crude oil: 30.82%
Total oil products production: 29.83%
Total gas oil production: 13.93%

Interactive Line chart

Production Trends by Product Type

Crude oil
Liquified Petroleum Gas
Naphtha
Total gas oil production
Total kerosene production
Gasoline and diesel
Residual fuel oil
Other oil products
Total oil products production
Total oil production
Middle distilates
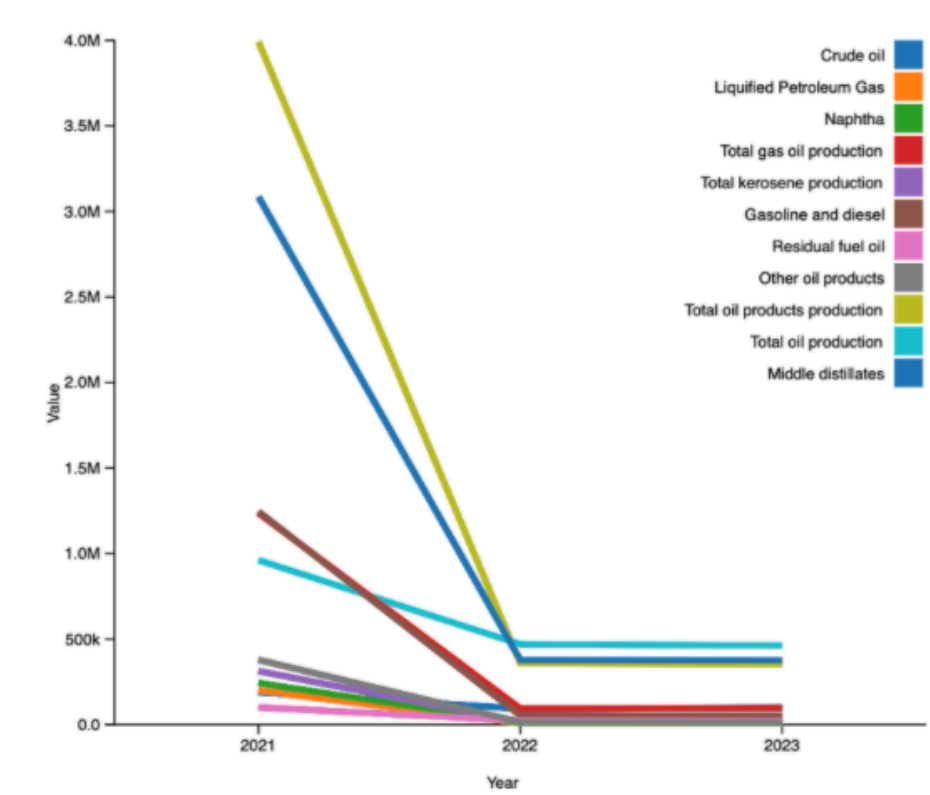
Chart-1 Interactive Donut Chart
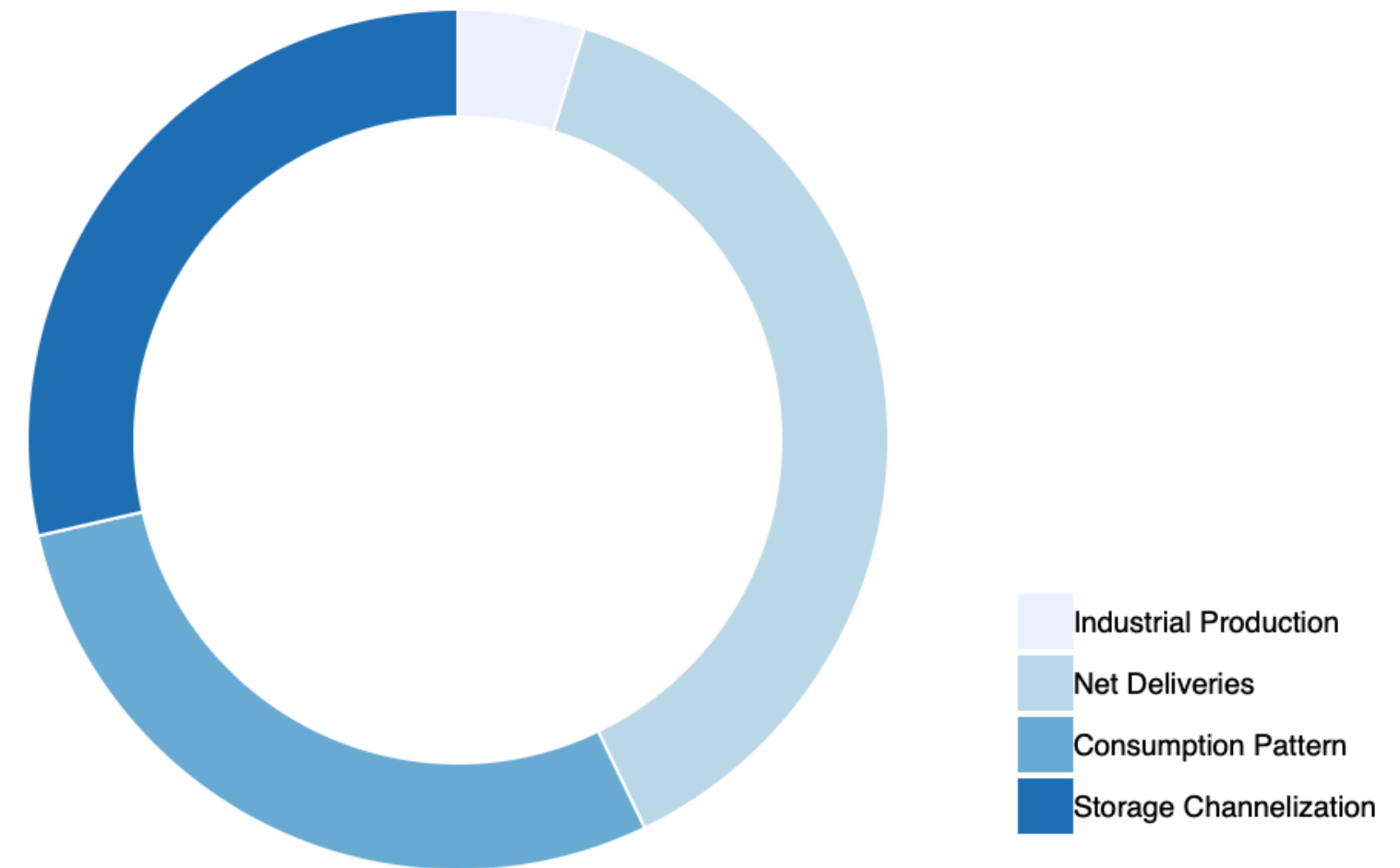
Yearly Production Breakdown:
Donut Chart: Display the count of different flow types for selected years.

- Purpose: Compare annual changes in the distribution of oil flows.
- Interactivity: Updates smoothly when different years are selected using radio buttons.

Chart-2 Zoomable Bar Chart

Country-Specific Production

Zoomable Bar Chart: Focus on production values for each country and bars can be dragged to reposition.

- Purpose: Analyze production levels and identify leading countries in oil production.
- Interactivity: Bars zoom to provide detailed views; drag and drop bars to rearrange positions.
- Linking Interactivity: Clicking a bar updates the pie chart, showing production values of different flow types for the selected year (chosen via radio button) and simultaneously highlights the corresponding country on the Choropleth Map
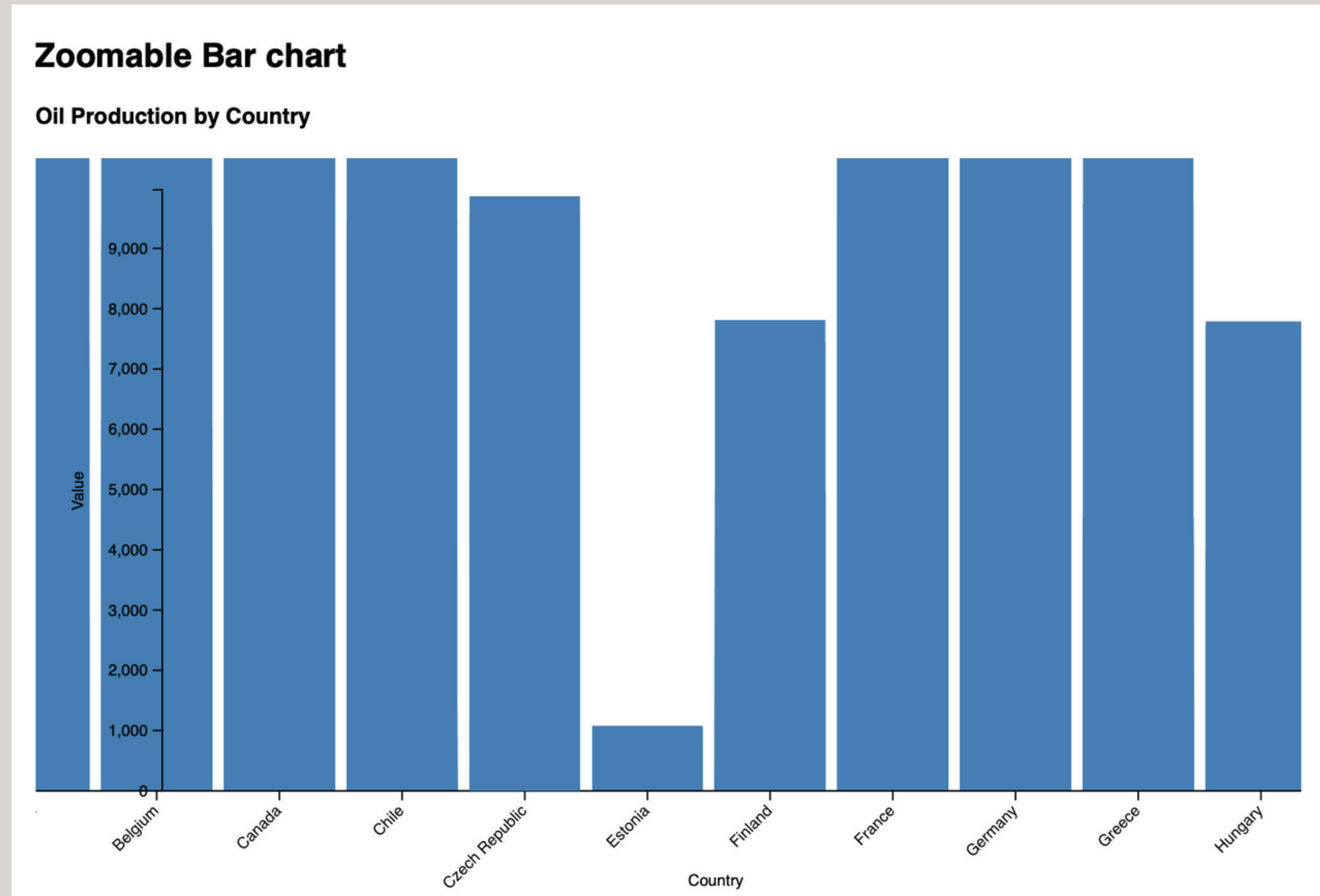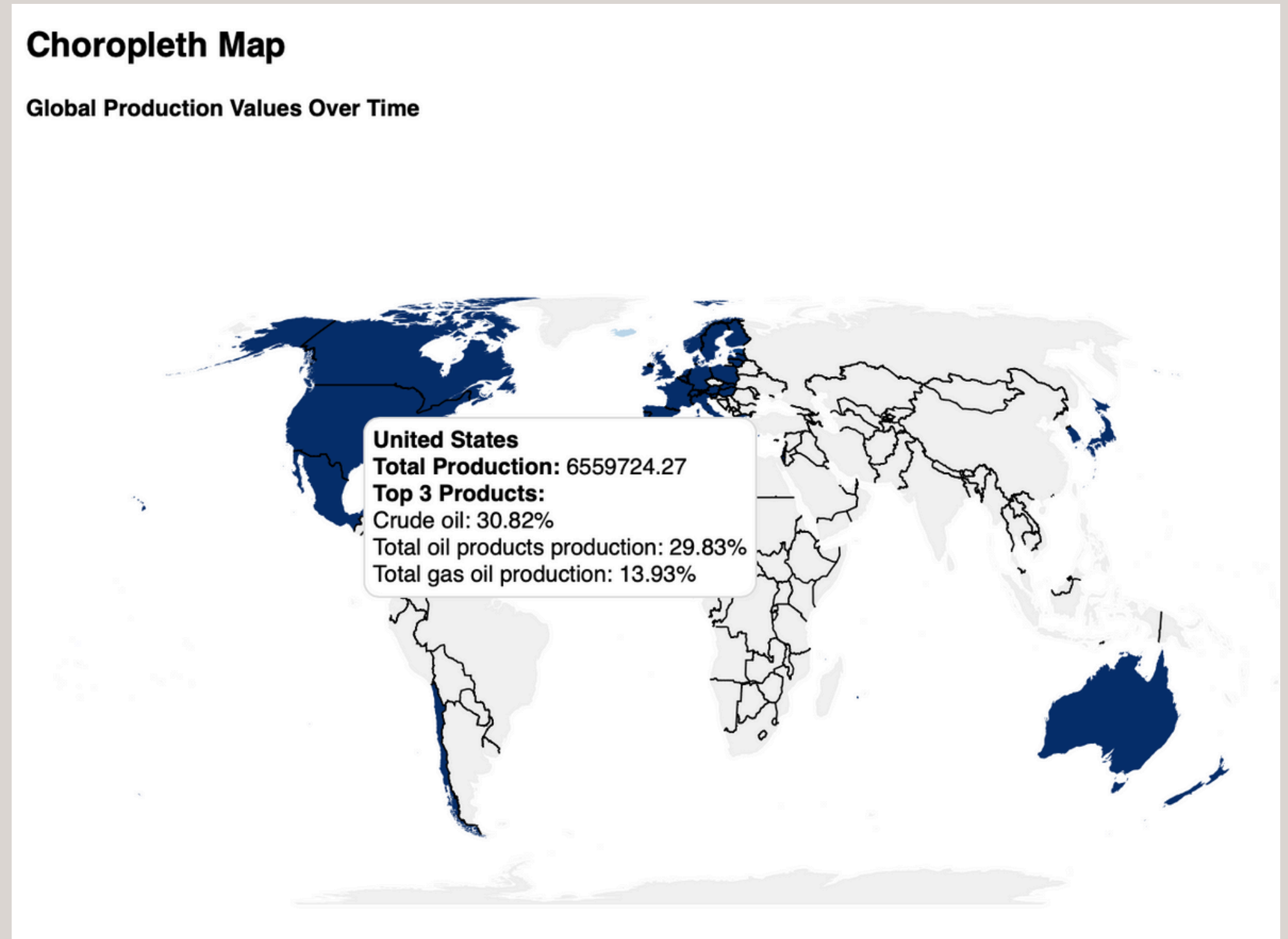
Chart–3 Choropleth Map

Global Overview:

Choropleth Map: Visualize oil production values across different countries from 2021 to 2023.

- Purpose: Identify top oil-producing countries and observe global distribution patterns.
- Interactivity: When hovered over a particular country, it displays information about the country, total production value, and the top 3 percentage of different product types and can be zoomed to provide detailed view

Choropleth Map

Global Production Values Over Time

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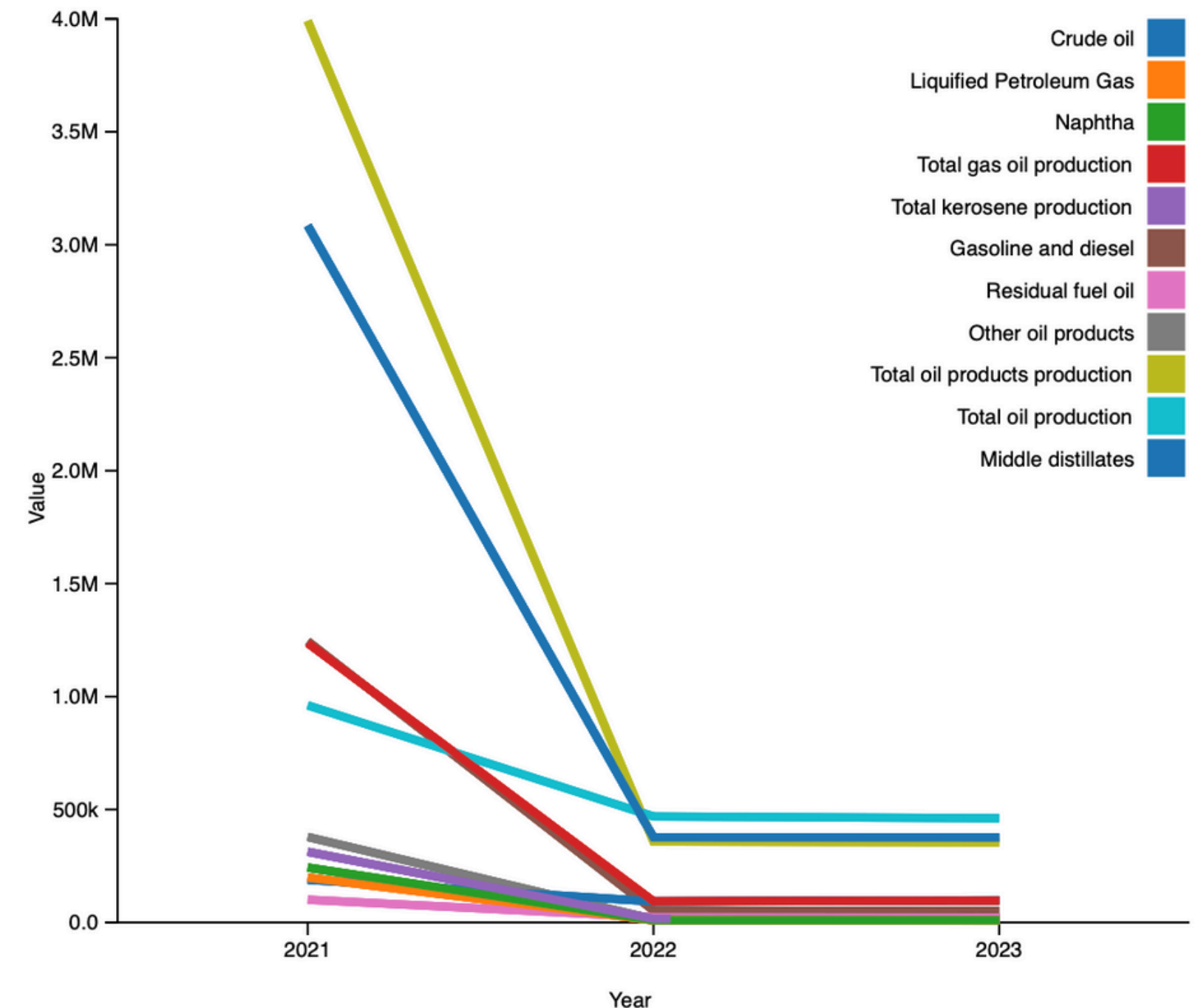
Chart-4 Animated Line Chart

Production Trends by Product:

Line Chart (Multiple Series): Show trends in oil production by different products from 2021 to 2023.

- Purpose: Track changes in production types over time.
- Interactivity: Lines transition one by one in an animated way, enhancing the visualization of trends.

Code Review

Challenges

1. Interaction and Linking Between Charts: Ensuring seamless chart interactions and linking was challenging, often requiring code reviews and debugging.

2. Chart Positioning: Achieving an optimal and intuitive layout for the charts involved careful planning and adjustments.

3.Team Dynamics: A teammate dropping out at the last minute added pressure and required additional effort.

4. Learning Curve with D3 and JavaScript: Familiarising myself with D3 and JavaScript was time-consuming, as these technologies were new to me and required extensive learning and experimentation.

Thank You