Individual Assignment 3 – D3 Implementation

1. Introduction

This assignment required each student to individually design and implement an interactive data visualization using D3.js. For this task, I designed and developed a **Sunburst Chart** based on the *Realistic Loan Approval Dataset (US and Canada)*. The objective of the visualization was to represent hierarchical relationships in loan application data, allowing users to explore approval and rejection patterns across different loan categories.

The visualization was fully developed using web technologies and deployed online using GitHub Pages.

2. Dataset Description

The dataset was obtained from Kaggle and contains realistic financial and demographic data related to loan applicants in the United States and Canada.
Some of the main attributes included in the dataset are:

- customer_id
- age
- occupation_status
- annual_income
- credit_score
- credit_history_years
- product_type
- loan_intent
- loan_amount
- loan_status

For the Sunburst visualization, the following three variables were selected to form the hierarchical structure:

1. **loan_status** (Approved / Rejected)
2. **product_type** (Home, Auto, Personal, etc.)
3. **loan_intent** (Education, Medical, Business, etc.)

These attributes allowed for an effective hierarchical grouping of data.

3. Visualization Type

The selected visualization type is a **Sunburst Chart**, which is ideal for representing hierarchical data in a circular layout.

Hierarchy Structure:

- **Level 1 (Inner Ring):** Loan Status
- **Level 2 (Middle Ring):** Product Type

- **Level 3 (Outer Ring):** Loan Intent

Each arc in the Sunburst chart represents a specific category, and the size of the arc corresponds to the number of loan applications within that category.

4. Visual Encodings

The following visual encodings were used in the Sunburst chart:

- **Arc size:** Represents the number of loan applications
- **Color:** Differentiates categories and hierarchy levels

SThese encodings help the user to quickly understand and explore the dataset.

5. Technologies Used

The following technologies were used for this implementation:

- HTML5
- CSS3
- JavaScript
- D3.js (Data-Driven Documents)
- GitHub / GitHub Pages (Hosting and Deployment)

6. Features Implemented

The Sunburst visualization includes the following features:

- Interactive hover tooltips showing data values
- Smooth animated transitions on page load
- Color-coded legend for easy understanding
- A modern user interface with a **light-blue shaded background**
- Responsive and clean design layout

These features improve user interaction and provide a better data exploration experience.

7. Links to Project

Source Code Repository:
https://github.com/habibahmadtarar/D3-Loan-Sunburst

Live Deployed Webpage:
https://habibahmadtarar.github.io/D3-Loan-Sunburst/

8. Conclusion

This project demonstrates my understanding of hierarchical data analysis and web-based visualization using D3.js. By implementing a Sunburst chart, I was able to effectively visualize loan approval patterns and provide an interactive platform to explore complex data relationships.

This assignment enhanced my skills in data processing, design thinking, and frontend development using modern visualization libraries.