Q 1(a) [12 Marks]

Using the topic from your CA682 visualisation assignment, apply the Generic Data Analytics Pipeline to describe how the data may have been Gathered, Processed, Analysed, Presented and Preserved. Give a brief description of the activities at each stage (1-2 sentences) and identify any specific tools that you did or would use. If you didn't specifically perform any stage then you can make assumptions or predictions about the actions and tools.

If you didn't complete a visualisation assignment then write about a scenario based on analysing *student feedback to DCU in relation to online teaching in 2020*.

Gathering
Processing
Analysis
Presenting
Preserving

Here are the answers to the assignment questions based on the report and details provided:

Q1(a): Generic Data Analytics Pipeline Application

Topic: *Impact of Democracy on Human Rights*

Gathering:
The data on democracy, civil liberties, and women's rights was gathered from trusted repositories like "Our World in Data". These datasets were sourced online, providing historical and contemporary data ranging from 1870 to 2023.
Tools: Browser tools for data download, APIs where applicable.

Processing:
The data was integrated and cleaned by converting country-level data to continent-level summaries and merging datasets based on year and continent. Null values in the Women's Rights dataset were handled, and duplicate and irrelevant columns were removed to streamline the dataset for analysis.
Tools: Python libraries like `pandas` for cleaning and merging.

Analysis:
Trends were analyzed to study connections between democracy, human rights, and women's rights. This involved entropy calculations, long-term trend observation, and identifying inverse relationships between autocracies and civil liberties.
Tools: Python libraries such as `pandas` for data manipulation and statistical analysis.

Presenting:
Data visualizations included multi-axis line charts tracking trends over time. The chart used distinct colors for clarity and separate axes for democracy, civil liberties, and women's rights metrics to avoid misrepresentation.
Tools: `matplotlib`, `seaborn`, `plotly` for interactive charts.

Preserving:
Processed datasets, visualizations, and analysis results were stored for future reference. Documentation in Jupyter Notebooks ensured reproducibility.
Tools: Jupyter Notebooks, GitHub, or cloud storage for archiving.

Q2: Statistical Models Used

The study relied on descriptive statistical analysis, such as trend visualization, to explore relationships between democracy, human rights, and women's rights. Key models or calculations include:

- Entropy analysis for long-term trends by continent.
- Aggregation techniques to summarize data by continent and year.

Q3: Key Findings

1. **Trends in Governance**: Post-World War II, there was a notable rise in democracies and a decline in autocracies, correlating with improved civil liberties. However, post-2000, a resurgence of closed autocracies has been observed, with a concurrent decline in civil liberties.
2. **Women's Rights**: The second wave of feminism (1960-70s) marked a steady rise in women's rights globally. Indicators like education access, reproductive rights, and gender equality laws saw significant improvements post-1970.
3. **Inverse Relationships**: There is a clear inverse correlation between the prevalence of autocracies and civil liberties.

Q4: Improvements and Observations

- **Data Improvements**: Including more granular data at the country level could enhance insights into regional variations.

- **Chart Design**: Adding interactive elements or tooltips could make the visualizations more accessible for diverse audiences.
- **Broader Metrics**: Incorporating economic or health indicators could provide a more holistic view of how governance impacts quality of life.

If you need deeper insights or clarifications for any part, let me know!