Project Report: Labour Force Survey Data Analysis and Visualization in Power BI

# 1. Introduction

This project involves the analysis and visualization of the 2025 Labour Force Survey (LFS) Public Use Microdata File (PUMF) using Power BI. The goal is to extract meaningful insights about employment trends, wage distributions, gender disparities, and the impact of education across Canadian provinces.

# 2. Tools and Technologies Used

- Python (Pandas, Excel handling) for data cleaning and preparation  
- Power BI for interactive dashboards and visualizations  
- Microsoft Excel for initial file handling  
- Labour Force Survey Codebook for decoding categorical variables

# 3. Data Preparation in Python

The raw dataset was first preprocessed in Python to clean null values, map coded variables to human-readable labels, and export the data into a clean Excel file ready for Power BI. Key columns such as HRLYEARN (hourly earnings) were transformed and labeled appropriately.

# 4. Visualizations Created in Power BI

Several key visuals were created:  
- Average Hourly Wage by Education Level (Clustered Column Chart)  
- Employment Count by Province (Bar Chart and Map)  
- Wage Distribution (Histogram using Binned HRLYEARN)  
- Employment by Gender (Clustered Column Chart)  
- Labour Force Status Breakdown (Pie Chart)  
- Interactive Education-Level Slicer with Tile Style

# 5. Formatting and Design Choices

To ensure clarity and visual appeal:  
- Consistent font styles (Segoe UI, Calibri) and color palettes were used  
- Chart titles were standardized and aligned  
- Slicers were styled with tile formats and rounded corners  
- Background changed to soft light gray for visual comfort  
- Borders and shadows were added to visuals for separation

# 6. Insights and Conclusion

The analysis reveals:  
- Higher education levels correlate with higher average wages  
- Gender wage disparities are evident, particularly at lower education levels  
- Employment distribution varies widely across provinces  
- Most people earn within a middle wage range, with fewer at the extremes  
This dashboard provides an interactive and insightful tool for policymakers, researchers, and the public to understand Canada’s labour dynamics.

# 7. Appendix

A. Key Variable Descriptions:  
- LFSSTAT: Labour Force Status (Employed, Unemployed, etc.)  
- HRLYEARN: Hourly Earnings  
- EDUC: Education Level (mapped using codebook)  
- FINALWT: Final Survey Weight used for accurate population estimates  
- PROV: Province Code (mapped to names)  
- GENDER: Gender (Men+, Women+)  
- AGE\_12: Age Group (categorical)  
  
B. Data Cleaning Steps:  
- Removed or replaced nulls in key columns  
- Replaced coded variables with labels  
- Filtered only employed individuals for wage analysis  
- Created calculated columns using DAX in Power BI