

Final Project Report Template

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Global malnutrition trends: a power bi analysis (1983-2019)

1.Introduction

1.1 Project Overviews

Introduction:

ABC Company is undertaking an in-depth analysis of global malnutrition trends from 1983 to 2019 to better understand the prevalence and distribution of various forms of malnutrition among children under five years of age. Utilizing a comprehensive dataset from UNICEF/WHO/World Bank, the project aims to analyze severe wasting, wasting, stunting, underweight, and overweight conditions across different countries. By classifying countries according to their income levels (low, lower-middle, upper-middle, and high income) and other categories such as Least Developed Countries (LDC), Low Income Food Deficient (LIFD), Land Locked Developing Countries (LLDC), and Small Island Developing States (SIDS), the project seeks to uncover correlations between economic status and malnutrition rates. Through the use of advanced data visualization techniques in Power BI, including stacked bar charts and line charts, ABC Company aims to generate actionable insights that can guide policy-making and resource allocation to combat child malnutrition effectively.

Malnutrition remains a critical global health issue, with children in lower-income countries disproportionately affected. ABC Company aims to address the challenge of identifying key patterns and trends in child malnutrition data over several decades. The primary problem is to determine how various forms of malnutrition correlate with economic and geographical classifications of countries, and to identify which countries and regions are most affected. By leveraging historical data, the project will highlight areas needing urgent attention and support, helping stakeholders to prioritize interventions and strategies for reducing malnutrition and its associated health risks among children under five. This analysis is crucial for developing targeted, data-driven solutions to improve child health outcomes worldwide.

Scenario 1: Count of U5 Population (140)

This metric represents the number of observations related to the under-five population in the dataset. It indicates the sample size or the count of data points collected.

Scenario 2:Sum of Survey Sample (11M)

The total sum of survey samples collected is 11 million. This large sample size adds robustness to the analysis and findings, ensuring that the insights derived are based on a substantial amount of data.

Scenario 3: Sum of Underweight (2.08K)

The total number of underweight cases is 2,080. This highlights the prevalence of underweight conditions among children under five, which is a critical aspect of malnutrition to address.

Scenario 4: Sum of LDC,LIFD,LLDC or SID2 and Average of Stunting by Income Analysis

The visualization is about the average spending by income. The x-axis shows income classification, likely divided into segments, and the y-axis shows the average spending. There is a trend line that shows that as income classification goes up, average spending also goes up.

Scenario 5: Sum of Overweight by Country

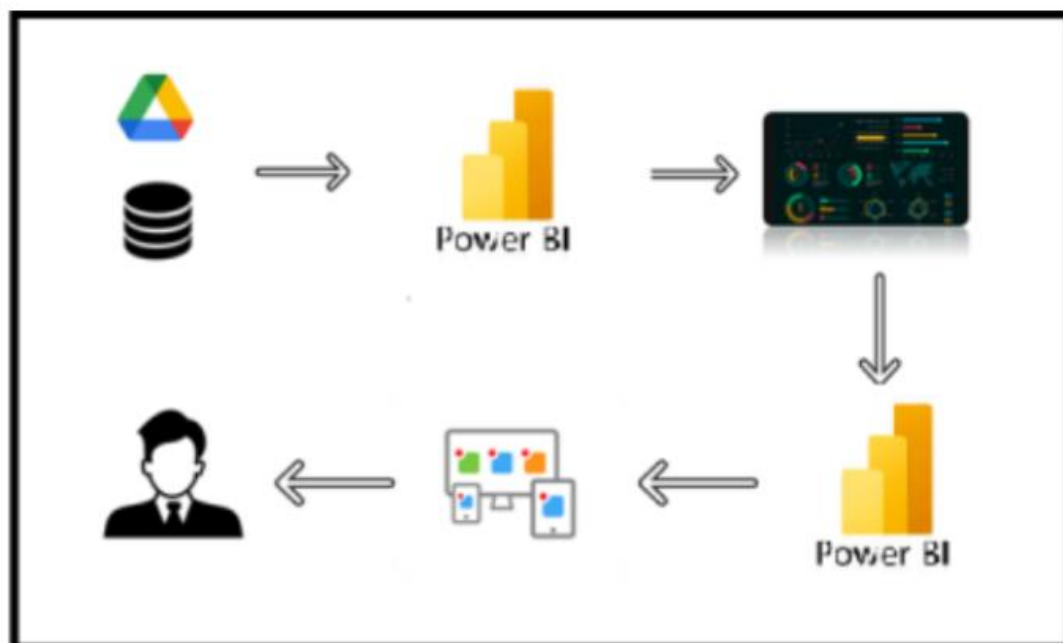
The visualization is about the total number of overweight people in various countries, according to a dataset titled "Sum of Overweight".

Scenario 6: Sum of Overweight and Underweight under Income Classification.

The width of each ribbon segment (overweight or underweight) for a specific income level indicates the relative size of that population group within that income bracket. By following the ribbon's path, you can see if overweight or underweight populations become more or less dominant as income levels change.

Scenario 7: Sum of Income Classification

It represents the total income within each income bracket, but without knowing the number of people in each bracket, it's difficult to interpret. A high total could be due to a few very high earners or many people with moderate incomes. Labels for each income bracket (e.g., low, middle, high).



Project Flow

To accomplish this, we have to complete all the activities listed below,

- Data Collection
- Collect the dataset,
- Connect Data with Power BI
- Data Preparation
- Prepare the Data for Visualization
- Data Visualizations
- Visualizations
- Dashboard
- Responsive and Design of Dashboard
- Report
- Report Creation
- Performance Testing
- Utilization of Data Filters
- No. of Calculation fields
- No. of Visualizations/Graphs
- Project Demonstration & Documentation
- Record explanation Video for project end to end solution
- Project Documentation-Step by step project development procedure

1.2 Objectives

The objective of this project is to design an interactive Power BI dashboard that visualizes and analyzes global malnutrition trends using real-world datasets. By examining key indicators such as underweight, stunting, and overweight across countries, income classifications, and time periods, the dashboard aims to uncover disparities, highlight dual nutrition burdens, and support data-driven policy recommendations for global health and nutrition initiatives.

2. Project Initialization and Planning Phase

2.1 Define Problem Statement

Global Malnutrition trends : A Power bi Analysis (1983-2019)

Global malnutrition patterns have shifted dramatically from 1983 to 2019, but these changes remain buried in fragmented datasets and scattered reports. To support researchers, students, and decision-makers, this project builds a unified Power BI dashboard—transforming raw data into clear, interactive visuals that reveal region-wise nutrition trends and economic disparities over time.

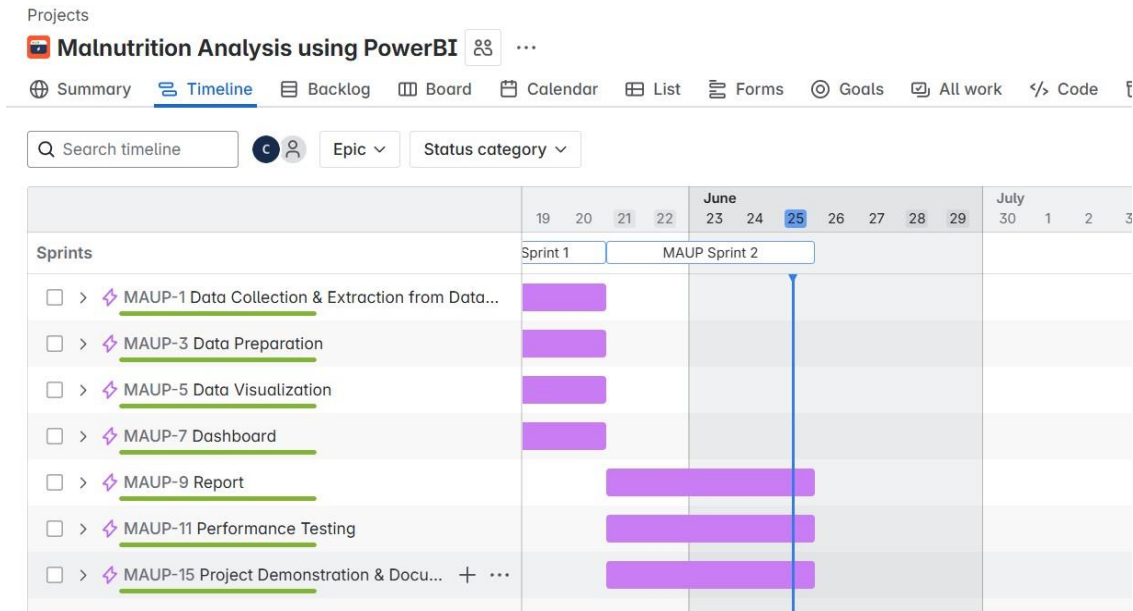
2.2 Project Proposal

This project proposal outlines a solution to address the challenges of interpreting global malnutrition data. With a clear objective, defined scope, and a concise problem statement, the proposed solution details a dashboard-driven approach, highlights key visualization features, and identifies essential resources, including data, software, and system requirements.

Project Overview	
Objective	To build a centralized Power BI dashboard that visualizes global malnutrition trends from 1983 to 2019, highlighting regional and economic disparities for better decision-making and research insight.
Scope	The project uses the Kaggle dataset. It includes data modeling, data transformation, and the creation of interactive Power BI visuals across underweight, overweight, stunting, and wasting indicators by country, year, and income classification.
Problem Statement	
Description	Malnutrition data is available but scattered across regions, years, and indicators, making it difficult for users to extract meaningful insights from traditional static reports.
Impact	Researchers, students, and public health professionals are unable to track trends or draw effective comparisons without a dynamic visual solution.
Proposed Solution	
Approach	Import and clean the malnutrition-estimates.csv and country-wise-average.csv dataset in Power BI, preprocess key metrics (like underweight, overweight, stunting), and design an

	interactive dashboard. The dashboard will include country-level comparisons, income group filters, and trend analysis visuals.
Key Features	<ul style="list-style-type: none">• Dynamic slicers (Year, Region, Income Group)• KPIs for nutrition indicators• Country-wise trend graphs• Demographic-based comparisons (e.g., gender)• Insight cards and summary panels

2.3 Initial Project Planning



3. Data Collection and Preprocessing Phase

3.1 Data Collection Plan and Raw Data Sources Identified

Raw Data Sources Template

Source Name	Description	Location/URL	Format	Size	Access Permissions
Malnutrition-estimates.csv	Year-wise country-level data on stunting, wasting, underweight, and overweight indicators with demographics details.	https://www.kaggle.com/datasets/ruchi798/malnutrition-across-the-globe?select=malnutrition-estimates.csv	CSV	~2GB	Public

3.2. Data Quality Report

Data Quality Report Template

Data Source	Data Quality Issue	Severity	Resolution Plan
Malnutrition-estimates.csv	Presence of blank rows and null values across multiple columns	Moderate	Used power bi Query editor to remove blank rows and handled null values using filtering.
	Some values had inconsistent	Low	Converted numeric fields to fixed decimal format for

	number formatting(e.g mixed decimal formats)		consistent display and comparison.
	Sample survey entry contained incorrect or placeholder data	Low	Removed the survey record during data cleaning as it didn't match valid reporting structure.

3.3 Data Exploration and Preprocessing Template

Section	Description
Data Overview	The project utilizes from Kaggle: malnutrition-estimates.csv for year-wise country-level data and country-wise-average.csv for summarized country-level indicators. These cover stunting, wasting, underweight, and overweight from 1983-2019.
Data Cleaning	Removed blank rows and null values using Power Query. Standardized inconsistent country names. Resolved duplicate entries by verifying each combination of country, year, gender and indicator.
Data Transformation	Performed filtering to focus on year 1983-2019 and relevant indicators. Created calculated columns for average prevalence and grouped regions. Sorted records by country and year for dashboard sequencing.
Data Type Conversion	Ensured numeric fields were in fixed decimal format. Categorical fields like gender and income group were corrected to proper text data types.

Column Splitting and Merging	Splitting the data where fields if there is need for it.
Data Modeling	Established relationships between the two datasets based on country names. Defined one to my relationship for indicator values and created DAX measures for average and trends.
Save Processed Data	Saved the cleaned and transformed dataset into Power BI (.pbix) file and exported intermediate versions to excel for backup.

4.Data Visualization

4.1 Framing Business Questions

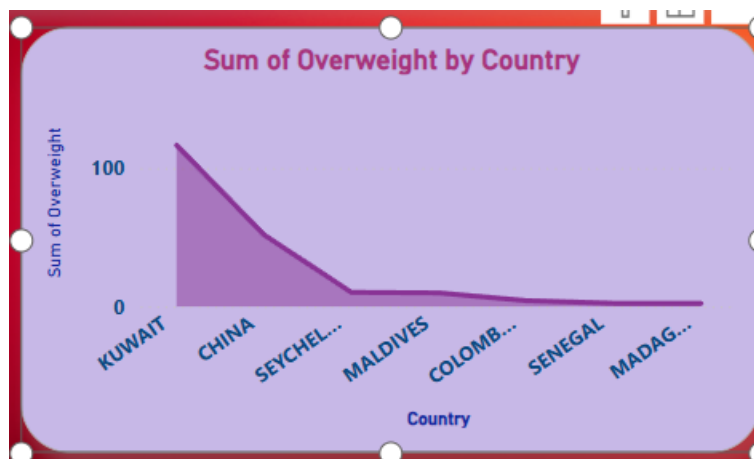
1. What is the total underweight count and sample across all records?

- *Visualization:* Card visuals showing total KPI's



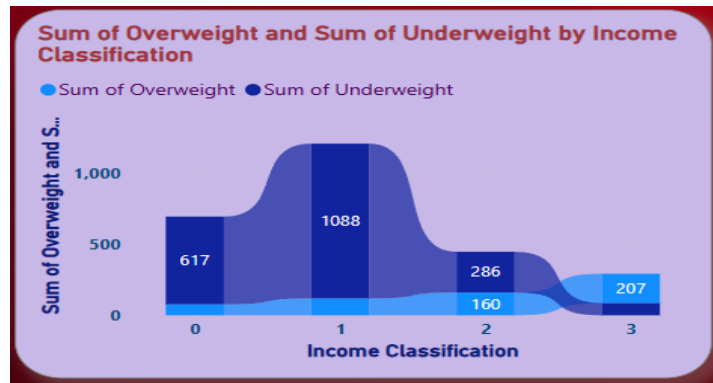
2. How do overweight and underweight indicators vary by income classification?

- *Visualization:* Stacked area chart
- *Screenshot of visualisation*



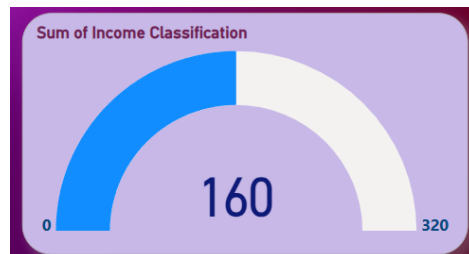
3. Which countries have the highest overweight level overall?

- Visualization: Ribbon chart showing highlighting overweight by country
- Screenshot of visualisation



4. What is the total contribution of income classifications across all records ?

- Visualization: Gauge chart showing sum of income classification
- Screenshot of visualisation



5. What is the relationship between stunting and income groups globally?

- Visualization: Map visualization that shows Line and stacked column chart

6. How does income classification impact the overall stunting trend globally?

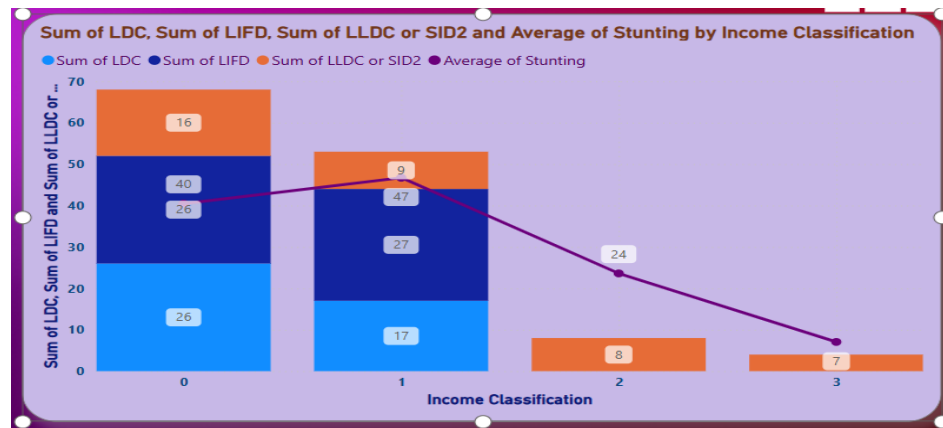
- Visualization: Line and stacked column Map visualization showing stunting across income groups.

7. Which indicator contributes the most to global malnutrition distribution?

- *Visualization:* Line and stacked Map visualization showing stacked contribution across indicators.

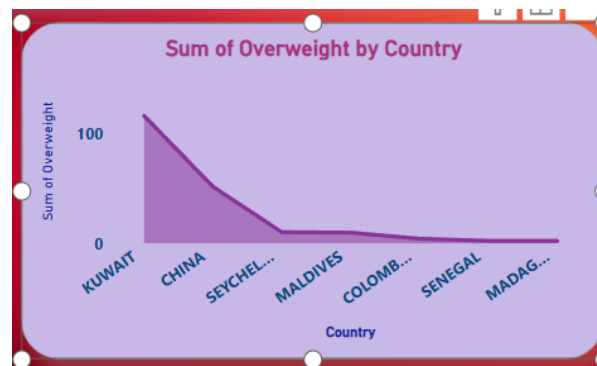
Screenshort of visulaization

- *Visualization:* Map visualization that shows Line and stacked column chart



8. What is the trend of stunting and underweight cases over time globally?

- *Visualization:* Stacked area chart visualization showing area chart filtered by time
- *Screenshot of visualisation*



4.2 Developing Visualizations

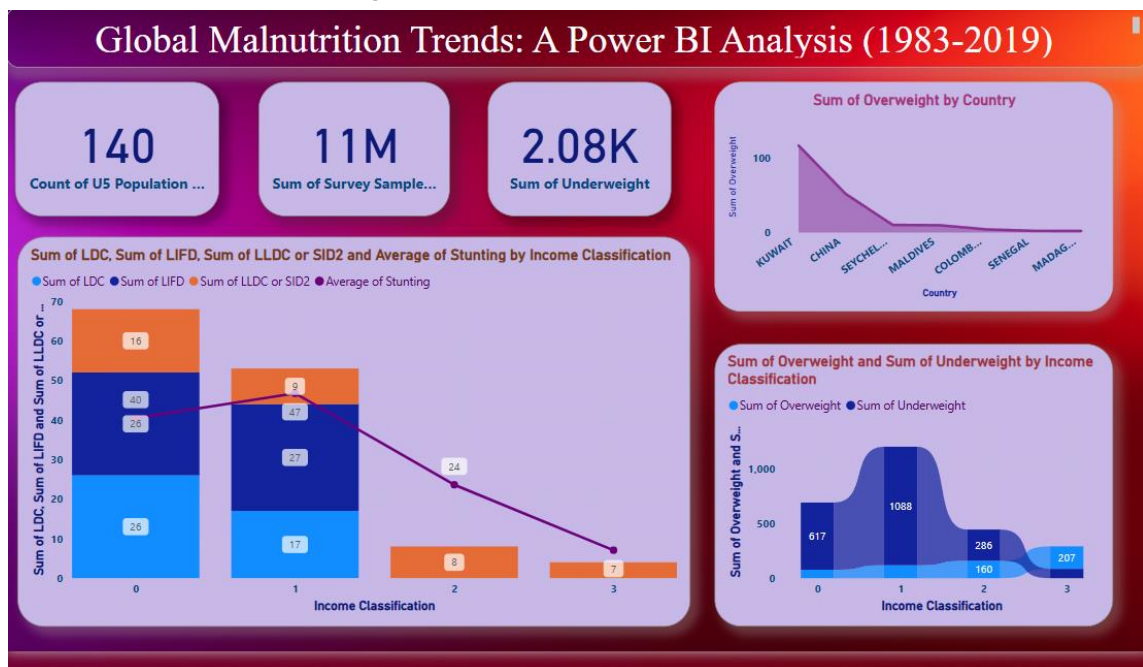
Visualisation Development Overview As part of this Power BI project, effective visualisation development plays a key role in transforming complex malnutrition datasets into interactive, insight-driven dashboards. By aligning each visual with specific business questions, the goal is to enable deeper understanding of global nutrition patterns, highlight disparities across demographics, and support data-backed decision-making. The

visuals are designed to be clear, accessible, and directly tied to meaningful insights derived from the data.



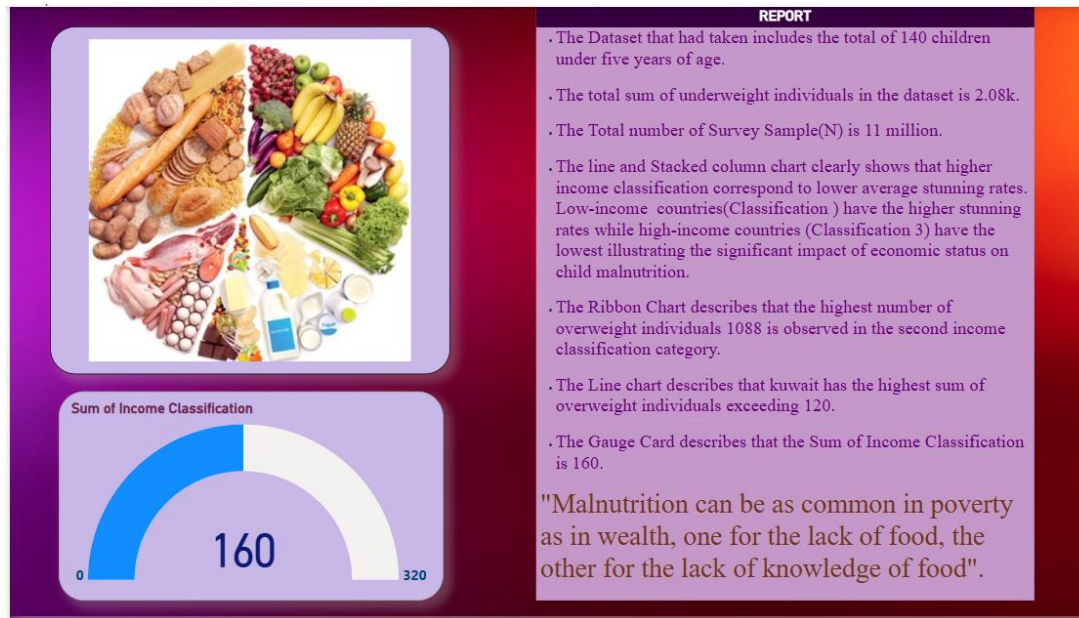
5. Dashboard

5.1 Dashboard Design File



6.Report

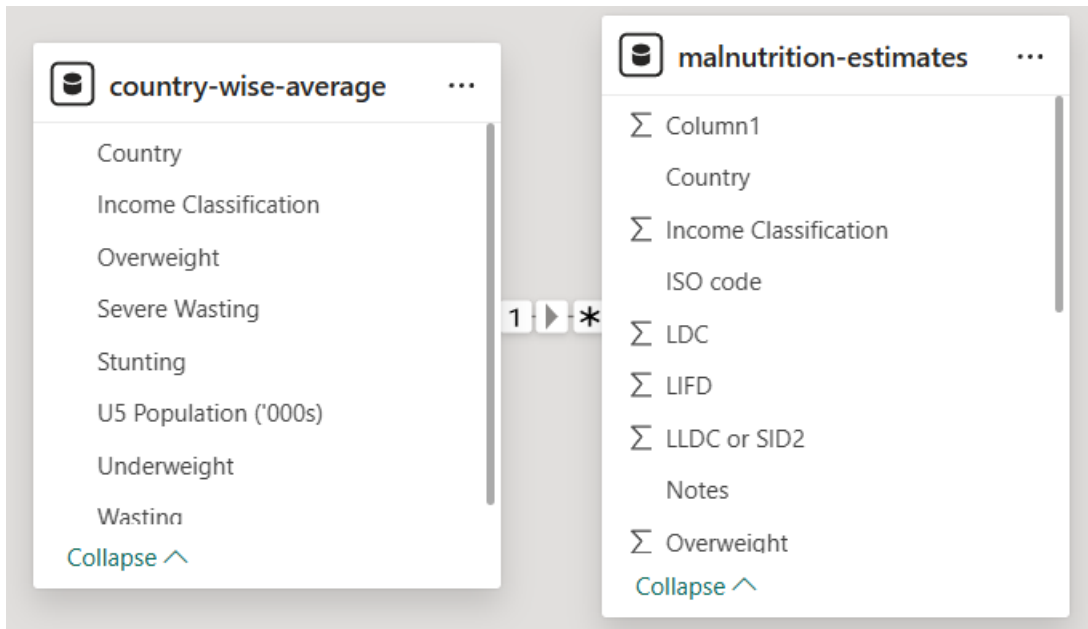
6.1 Story Design File



7. Performance Testing

7.1 Amount of Data Loaded

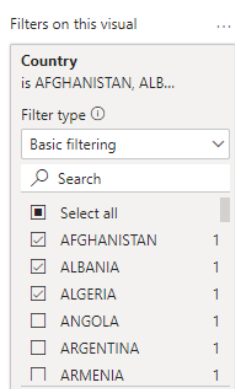
"Amount of Data Loaded" refers to the quantity or volume of data that has been imported, retrieved, or loaded into a system, software application, database, or any other data storage or processing environment. It's a measure of how much data has been successfully processed and made available for analysis, manipulation, or use within the system.



7.2 Utilization of Filters

"Utilization of Filters" refers to the application or use of filters within a system, software application, or data processing pipeline to selectively extract, manipulate, or analyze data based on specified criteria or conditions.

Activity 2.1: Selected "Country" as a Filter



7.3 No of Visualizations/ Graphs

1. Count of U5 Population
2. Sum of Survey Sample(N)
3. Sum of Underweight
4. Sum of Overweight by Country
5. Total Income Classification
6. Sum of Overweight and Underweight by Income Classification
7. Sum of LDC, LIFD, LLDC or SID2 and Average of Stunting by Income Analysis

8. Conclusion/Observation

The Power BI dashboard provides a clear, data-driven understanding of global malnutrition trends across income groups and countries. It highlights how economic status correlates with stunting, underweight, and overweight rates—revealing that malnutrition exists not only due to poverty, but also from poor dietary knowledge in wealthier regions. Countries like Kuwait face high overweight burdens, while lower-income nations struggle with stunting and underweight. Your analysis demonstrates the

pressing need for targeted nutrition strategies based on regional and economic factors.

9. Future Scope

- **Expand the dataset** to cover more countries, age groups, and recent years.
- **Incorporate intervention data** to assess the impact of nutrition programs.
- **Develop predictive models** to forecast future malnutrition risks.
- **Add geographic visualizations** like heatmaps for deeper regional insights.

10. Appendix

1. GitHub & Project Demo Link