Global Malnutrition Trends: A Power BI Analysis (1983-2019)

Introduction :

This project aims to analyze global malnutrition trends from 1983 to 2019 using Power BI. By leveraging data visualization techniques, the project will provide insights into regional disparities, demographic patterns, and long-term trends in malnutrition rates. The analysis will help policymakers, health organizations, and researchers understand key drivers of malnutrition and develop targeted interventions to address this global challenge.

Through a rigorous examination of key malnutrition indicators—including stunting, wasting, and undernutrition prevalence—stakeholders will gain actionable insights into the effectiveness of past policies and future areas of improvement. This project ultimately seeks to empower decision-makers with the tools and data-driven insights needed to combat malnutrition and improve public health outcomes worldwide.

Scenario 1 - Policy Impact Assessment:

A global health organization wants to assess the effectiveness of past malnutrition intervention programs. By using *Global Malnutrition Trends: A Power BI Analysis*, they can track changes in malnutrition rates across different regions over time. This allows them to evaluate whether initiatives such as food security programs, vitamin supplementation, and nutritional education have been successful. Power BI's interactive dashboards will highlight regions requiring urgent intervention, helping organizations optimize resource allocation for maximum impact.

Scenario 2 - Regional Disparity and Vulnerability Analysis:

A government agency is conducting a study on regional disparities in malnutrition to identify high-risk populations. With *Global Malnutrition Trends*, they can visualize malnutrition rates across urban and rural areas, analyze income-based disparities, and compare trends among different age groups. This data-driven approach enables policymakers to design targeted nutrition policies and develop localized strategies to improve food accessibility and healthcare services in vulnerable communities.

Scenario 3 - Emergency Response and Humanitarian Aid Planning:

An international humanitarian organization is responding to a food crisis in a developing country. Using *Global Malnutrition Trends*, they can monitor real-time data on malnutrition spikes, food shortages, and affected demographics. The Power BI dashboard provides a comprehensive view of the crisis, helping aid organizations plan food distribution, medical interventions, and long-term recovery programs. By identifying patterns in malnutrition, they can proactively address emerging issues before they escalate into severe humanitarian crises.

By transforming decades of malnutrition data into meaningful insights, this Power BI analysis will help global organizations make informed, data-driven decisions to combat malnutrition effectively.

Technical Architecture:

Project Flow

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

- Data Collection & Extraction from Database ○ Collect the dataset, ○ Storing Data in DB ○ Perform SQL Operations ○ Connect DB with Power Bi
- Data Preparation ○ Prepare the Data for Visualization
- Data Visualizations ○ No of Unique Visualizations
- Dashboard ○ Responsive and Design of Dashboard
- Report ○ Responsive and Design of Dashboard
- Performance Testing ○ No of Visualizations/ Graphs
- Project Demonstration & Documentation ○ Record explanation Video for project end to end solution ○ Project Documentation-Step by step project development procedure

Milestone 1: Data Collection & Extraction from Database

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes and generate insights from the data.

Activity 1: Collect the dataset

Activity 1.1: Understand the data

1.Malnutrition_data

Column Description for malnutrition_data

1. Country: The name of the country where the malnutrition data was recorded.

2. Income Classification: The income level classification of the country (Low, Middle, High Income).

3. ISO code: The standard country code assigned by the International Organization for Standardization (ISO).

4. LDC (Least Developed Countries): Indicates whether the country is classified as an LDC.

5. LIFD (Low-Income Food-Deficit Countries): Indicates whether the country is categorized as a Low-Income Food-Deficit Country.

6. LLDC or SID2 (Landlocked Developing Countries or Small Island Developing States): Specifies whether the country falls into either of these development classifications.

7. Notes: Additional information or comments regarding the dataset.

8. Overweight: The percentage of children classified as overweight based on WHO standards.

9. Report Author: The entity or organization that published the data.

10. Severe Wasting: The percentage of children suffering from severe wasting (extremely low weight-for-height).

11. Short Source: A brief reference to the original source of the data.

12. Source: The full reference or name of the organization providing the dataset.

13. Stunting: The percentage of children with stunted growth due to chronic malnutrition (low height-for-age).

14. Survey Sample (N): The number of children surveyed in the study.

15. Survey Year: The year in which the malnutrition data was collected.

16. U5 Population ('000s): The total population of children under 5 years old (in thousands) in the respective country.

17. Underweight: The percentage of children underweight for their age.

18. Wasting: The percentage of children with wasting (low weight-for-height), indicating acute malnutrition.

19.   Year: The year of the recorded malnutrition statistics.

Activity 2: Connect Data with Power BI

With Power BI, users can seamlessly connect to a wide range of data sources, including databases, cloud services, spreadsheets, and streaming data. This capability allows organizations to consolidate disparate data sources into a single, unified platform, breaking down data silos and enabling holistic analysis.

Explanation video link:

https://drive.google.com/file/d/1e9QoyhLzgV-LbMUC8un7_ozLtWqsD5Lg/view?usp=drive_link

Milestone 2: Data Preparation

Data preparation is a critical phase in the data lifecycle, encompassing activities that transform raw data into a format suitable for analysis. This multifaceted process involves several steps including data cleaning, integration, transformation, and enrichment. Data cleaning involves identifying and rectifying errors, inconsistencies, and missing values within datasets to ensure accuracy and reliability.

Activity 1: Prepare the Data for Visualization

Preparing the data for visualization involves cleaning the data to remove irrelevant or missing data, transforming the data into a format that can be easily visualized, exploring the data to identify patterns and trends, filtering the data to focus on specific subsets of data, preparing the data for visualization software, and ensuring the data is accurate and complete. This process helps to make the data easily understandable and ready for creating visualizations to gain insights into the performance and efficiency.

Explanation video link 1:

https://drive.google.com/file/d/1e9QoyhLzgV-LbMUC8un7_ozLtWqsD5Lg/view?usp=drive_link

# Milestone 4: Data Visualization

Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

Activity 1: No of Unique Visualizations

The number of unique visualizations that can be created with a given dataset. Some common types of visualizations that can be used to analyze the performance and efficiency of Social Pulse_ Illuminating the Digital Footprint - Unveiling Social Media Engagement Dynamics include bar charts, line charts, heat maps, scatter plots, pie charts,Maps etc. These visualizations can be used to compare performance, track changes over time, show distribution, and relationships between variables, breakdown of revenue and demographics, workload, resource allocation and location.
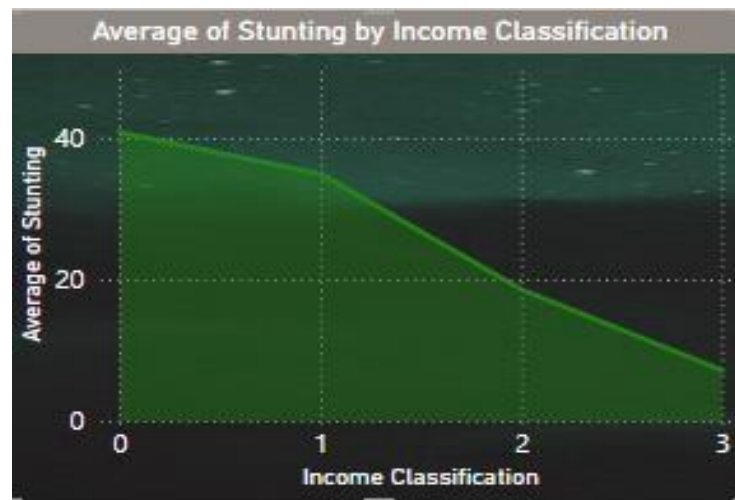
Activity 1.1:

Sum of Underweight by Income Classification
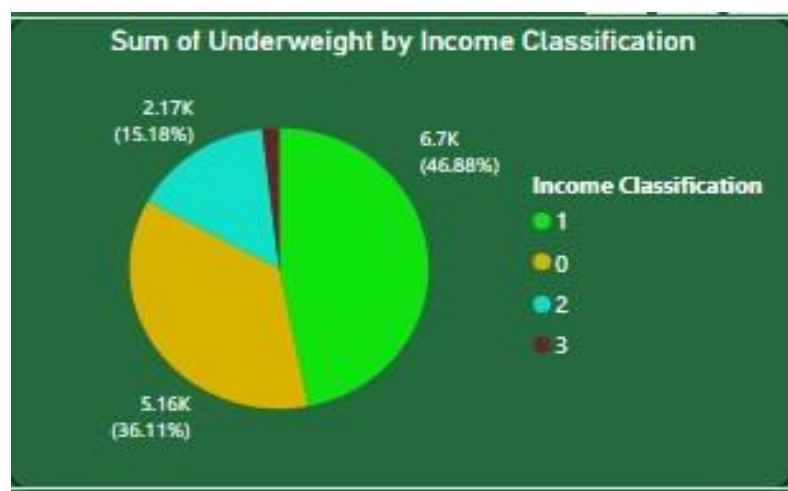
Activity 1.2: Sum of Overweight by Income Classification
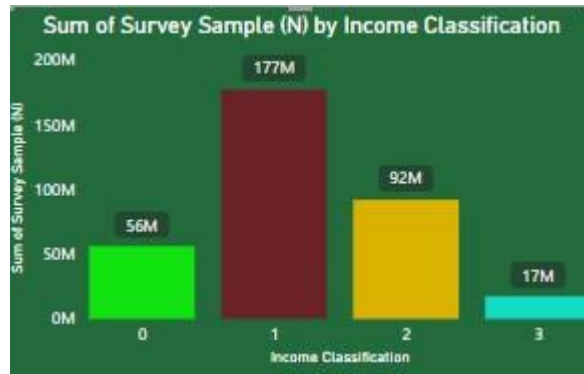

Activity 1.3: Average of Stunting by Income Classification

Average of Stunting by Income Classification

Activity 1.4: Sum of Underweight and Sum of Overweight by Income classification

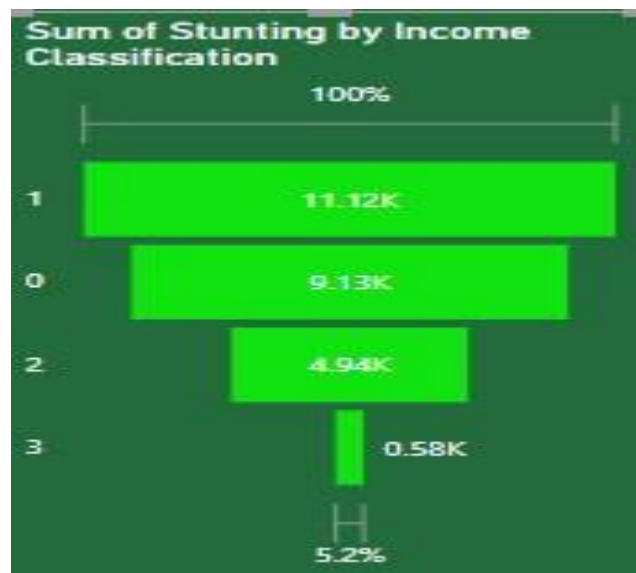Sum of Underweight and Sum of Overweight by Income Classification

Activity 1.5: Sum of Overweight by Country

Sum of Overweight by Country

Activity 1.6: Sum of Survey Sample(N) by Income Classification

Sum of Survey Sample (N) by Income Classification

Activity 1.7: Sum of stunting by Income Classification

Sum of Stunting by Income Classification

Activity 1.8: Filter by Year

Activity 1.9: Filter by Income classification

Activity 1.10: Sum of LLDC

421
Sum of LLDC or SID2

Activity 1.11: Average of Stunting

29.06
Average of Stunting

<u>Milestone 5: Dashboard</u>

A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data, and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of settings, such as business, finance, manufacturing, healthcare, and many other industries. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in the form of charts, graphs, and tables.

Activity :1- Responsive and Design of Dashboard

The responsiveness and design of a dashboard for Social Pulse Illuminating the Digital Footprint Unveiling Social Media Engagement Is crucial to ensure that the information is easily understandable and actionable. Key considerations for designing a responsive and effective dashboard include user-centred design, clear and concise information, interactivity, data-driven approach, accessibility, customization, and security. The goal is to create a dashboard that is user-friendly, interactive, and data-driven, providing actionable insights to improve the performance and efficiency of Social Pulse Illuminating the Digital Footprint Unveiling Social Media Engagement.

Once you have created views on different sheets in Power Bi you can pull them into a
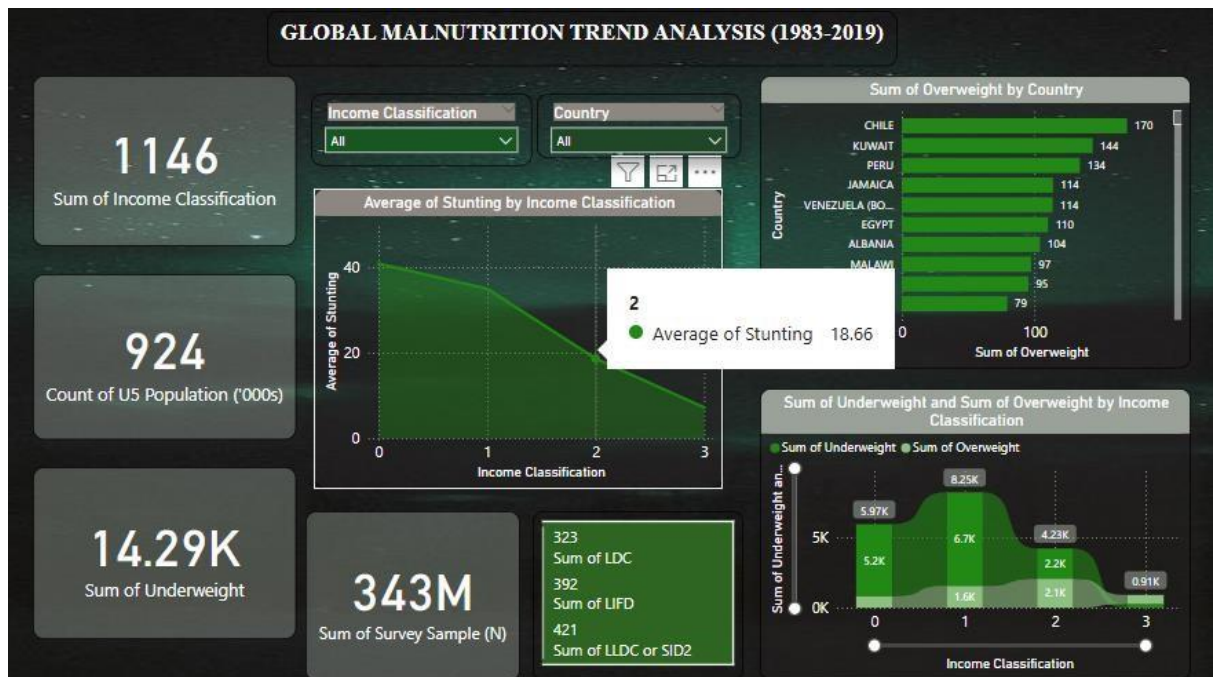
dashboard.

Dashboard 1 :

Explanation video link:
https://drive.google.com/file/d/1o7H0gALJyxNASuckPwvR1_fhwDcupEn2/view?usp=drive_link

Dashboard 2 :

Explanation video link:
https://drive.google.com/file/d/1zrKYdO8H0TTz6zBqSVHVcE3lrwHJjG4k/view?usp=drive_link

GLOBAL MALNUTRITION TREND ANALYSIS (1983-2019)

Milestone 6: Report

A data report is a way of presenting data and analysis in a narrative format, with the goal of making the information more engaging and easier to understand. A data story typically includes a clear introduction that sets the stage and explains the context for the data, a body that presents the data and analysis in a logical and systematic way, and a conclusion that summarizes the key findings and highlights their implications. Data Report can be told using a variety of mediums, presentations, interactive visualizations, and videos.

Report :

Explanation video link:
https://drive.google.com/file/d/1OfG95IJhSq0XYg1ETpEnK2zqiD7h_Rh8/view?usp=drive_link
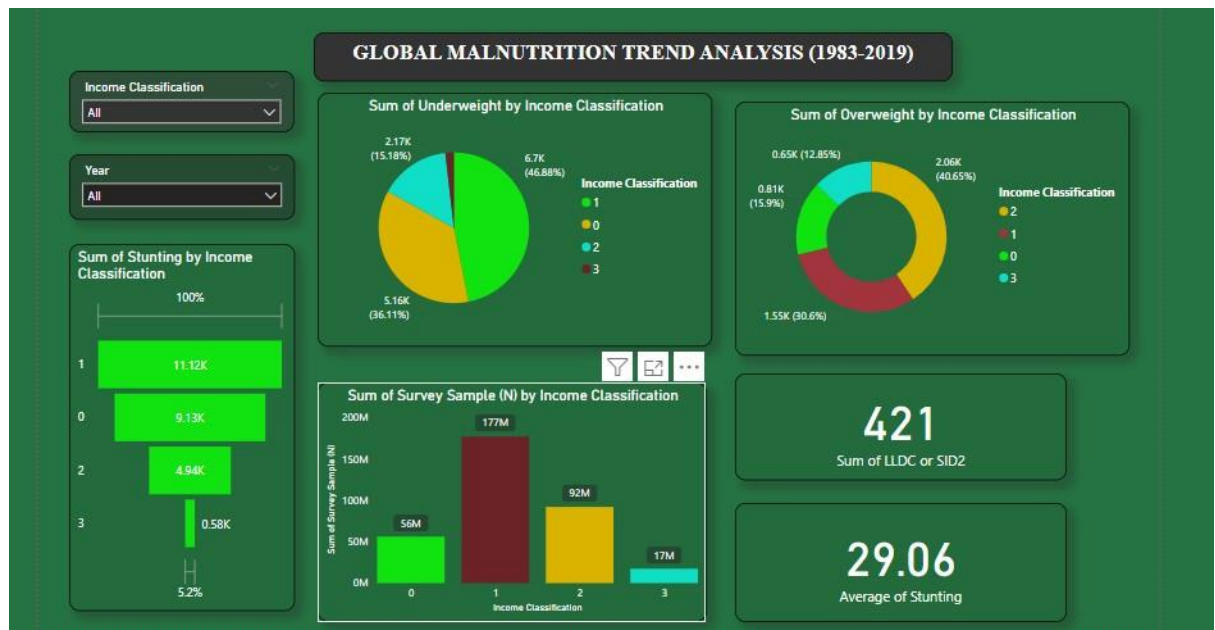
Milestone 7: Performance Testing

Performance testing is a crucial aspect of software development aimed at evaluating the speed, responsiveness, stability, and scalability of an application under various workload conditions. It involves simulating real-world usage scenarios to assess how the system behaves and performs under stress, peak loads, or normal conditions.

Activity 1: Utilization of Data Filters

The utilization of data filters plays a pivotal role in streamlining information processing and analysis across various domains. By selectively extracting or excluding specific data points based on predefined criteria, filters enable efficient data management and enhance decision-making processes.

Activity 2 : No of Visualizations/ Graphs

1. Age by Time Spent
2. Income By Interest
3. Home Owner By location
4. Platform By Gender

5. Age By Gender
6. Age by Indebt
7. Gender by Interest
8. Location By Demographics
9. Income By Profession
10. Home Owner by Indebt Status
11. Age by Profession
12. Owns Car by demographics

Milestone 8: Project Demonstration & Documentation

Below mentioned deliverables to be submitted along with other deliverables

Activity 1:- explanation Video for project end to end solution

1.https://drive.google.com/file/d/1o7H0gALJyxNASuckPwvR1_fhwDcupEn2/view?usp=drive_link

2.
https://drive.google.com/file/d/1zrKYdO8H0TTz6zBqSVHVcE3lrwHJjG4k/view?usp=drive_link

Activity 2:- Project Documentation-Step by step project development procedure

https://drive.google.com/file/d/1Sw8hJpmBnf8RftbSViy2VWtQT7wZD8vZ/view?usp=drive_link