**Project Initialization and Planning Phase**

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| Date | 13 June 2025 |
| Project Title | Global Malnutrition Trends: A Power BI Analysis (1983-2019) |
| Maximum Marks | 3 Marks |

Project Proposal

This project proposal outlines a solution to address the critical issue of malnutrition by analyzing historical trends and predicting future prevalence. With a clear objective, defined scope, and a concise problem statement, the proposed solution details the approach, key features, and resource requirements, including hardware, software, and personnel.

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| **Project Overview** | |
| **Objective** | To develop a data-driven system that analyzes historical malnutrition data, identifies key trends and contributing factors, and predicts future malnutrition estimates to support targeted interventions and policymaking. |
| **Scope** | This project will focus on analyzing global malnutrition data, specifically focusing on the metrics provided in the malnutrition-estimates.csv dataset (e.g., prevalence of stunting, wasting, underweight, overweight in children under 5, and women of reproductive age). The project will involve data cleaning, exploratory data analysis, trend identification, and predictive modeling. The output will be a system capable of visualizing historical trends and generating future predictions. |
| **Problem Statement** | |
| **Description** | Malnutrition remains a pervasive global health challenge with severe implications for individual well-being, economic |

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|  | development, and societal progress. The provided datasets (malnutrition-estimates.csv and country-wise- average.csv) highlight the varying prevalence of different forms of malnutrition across countries and over time. A lack of comprehensive, easily digestible analysis of these trends and reliable future predictions hinders effective policy formulation and resource allocation for intervention programs. |
| **Impact** | Solving this problem will provide stakeholders, including governments, NGOs, and public health organizations, with actionable insights into malnutrition patterns. This will enable more precise identification of vulnerable populations, proactive resource deployment, and the development of evidence-based strategies to combat malnutrition, ultimately leading to improved health outcomes and sustainable development. |
| **Proposed Solution** | |
| **Approach** | **Approach:**  The proposed solution will involve the following stages:   * **Data Acquisition and Preprocessing:** Load and clean the malnutrition-estimates.csv and country-wise- average.csv datasets, handling missing values and preparing data for analysis. * **Exploratory Data Analysis (EDA):** Conduct in-depth analysis to understand data distributions, identify correlations, and visualize historical malnutrition trends. * **Feature Engineering:** Create new features (e.g., yearly change, moving averages) to improve model performance. * **Trend Analysis:** Utilize statistical and time-series methods to identify significant trends, seasonality, and cycles in malnutrition prevalence. * **Predictive Modeling:** Develop and evaluate machine learning models for forecasting future malnutrition estimates. * **Visualization and Reporting:** Create interactive dashboards and reports to present historical data, current estimates, and future predictions. |

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| **Key Features** | * **Comprehensive Data Integration:** Combines detailed malnutrition estimates with country-wise averages for a holistic view. * **Interactive Trend Visualizations:** Allows users to explore historical malnutrition trends by country, year, and specific malnutrition indicator. * **Predictive Analytics:** Provides future estimates of various malnutrition metrics, aiding in proactive planning. * **Identifies High-Risk Areas:** Helps pinpoint countries or regions with worsening malnutrition trends. * **Customizable Reporting:** Generates reports that can be tailored to specific needs for policy brief creation or intervention planning. |

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| **Resource Type** | **Description** | **Specification** |
| **Hardware** |  |  |
| Computing Resources | CPU for data processing and model training | Quad-core processor (e.g., Intel i5/AMD Ryzen 5 or  equivalent) |
| Memory | RAM for handling datasets  and model execution | 16 GB RAM |
| Storage | Disk space for data,  models, and logs | 500GB SSD |
| **Software** |  |  |
| Frameworks | Data visualization and  development tools | Microsoft Power BI desktop  and service |
| **Data** |  |  |
| Data | Source, size, format | malnutrition- estimates.csv (approx. 500KB, CSV), country- wise-average.csv  (approx. 10KB, CSV) |