WEEK 3 INTERNSHIP REPORT: IN-DEPTH ANALYSIS OF FOOD SECURITY, ECONOMIC GROWTH, AND AGRICULTURAL PRODUCTIVITY

| Intern | Wahab Olagoke Ibrahim| Week 3 | Tools | Python (Pandas, Matplotlib, Seaborn), SQL, Data Visualization |

1. Overview of Weekly Activities

This week concentrated on a deeper comparative analysis of key food security metrics. The primary activities included:

- Identifying top-performing countries in hunger reduction over the past decade.
- Analyzing the relationship between GDP per capita and undernourishment in selected major countries.
- Evaluating the production efficiency of common staple crops by yield.

2. Analysis and Visualizations

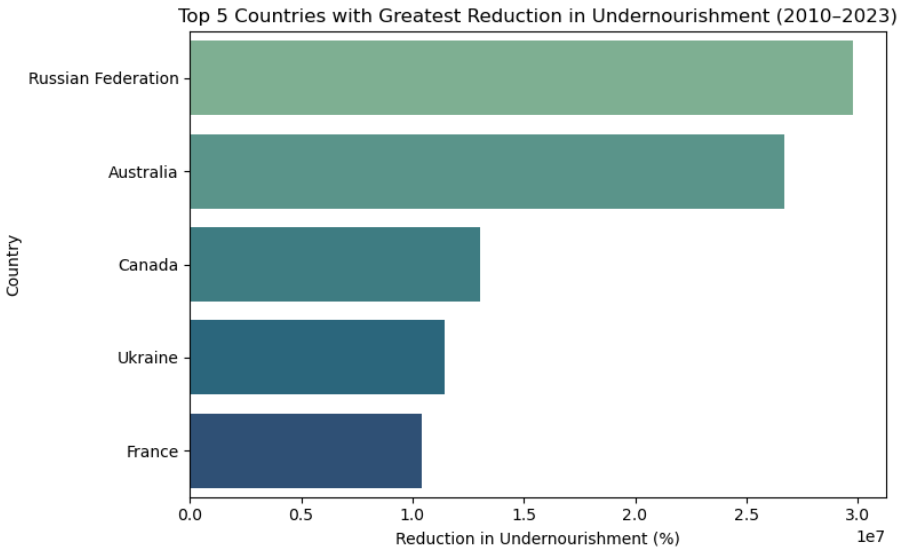
Three distinct queries and subsequent visualizations were executed to derive granular insights.

2.1 Top 5 Countries with Greatest Reduction in Undernourishment (2010–2023)

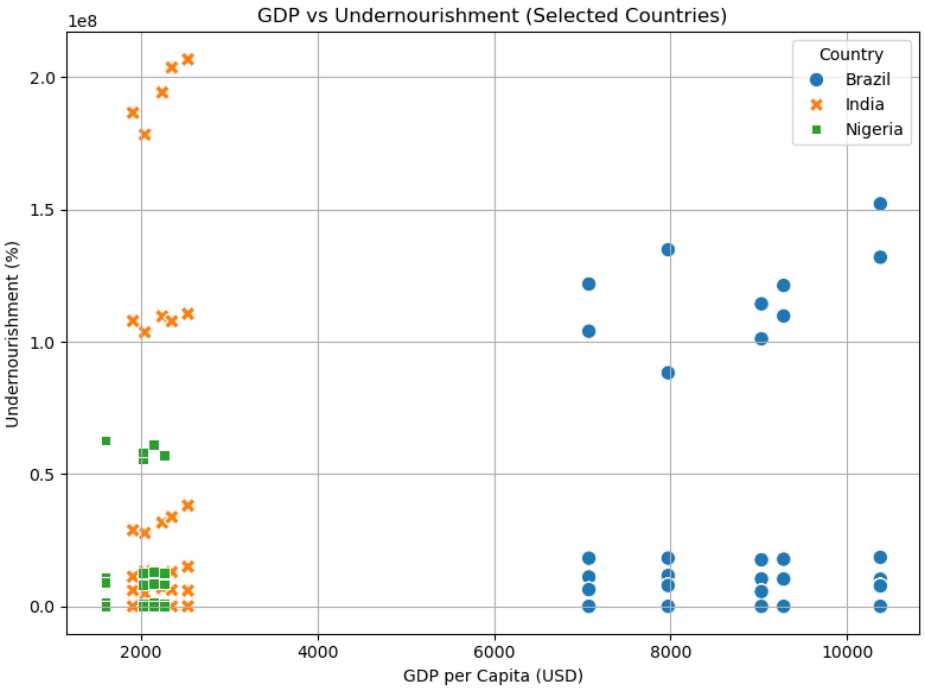
This visualization identifies the countries that achieved the largest absolute reduction in their undernourished population count between 2010 and 2023.

Country	reduction_percent
Russian Federation	$29,781,252.00
Australia	$26,719,268.56
Canada	$13,015,100.00
Ukraine	$11,454,060.00
France	$10,423,820.00

Visualization (Python-Derived Bar Chart): Figure 1

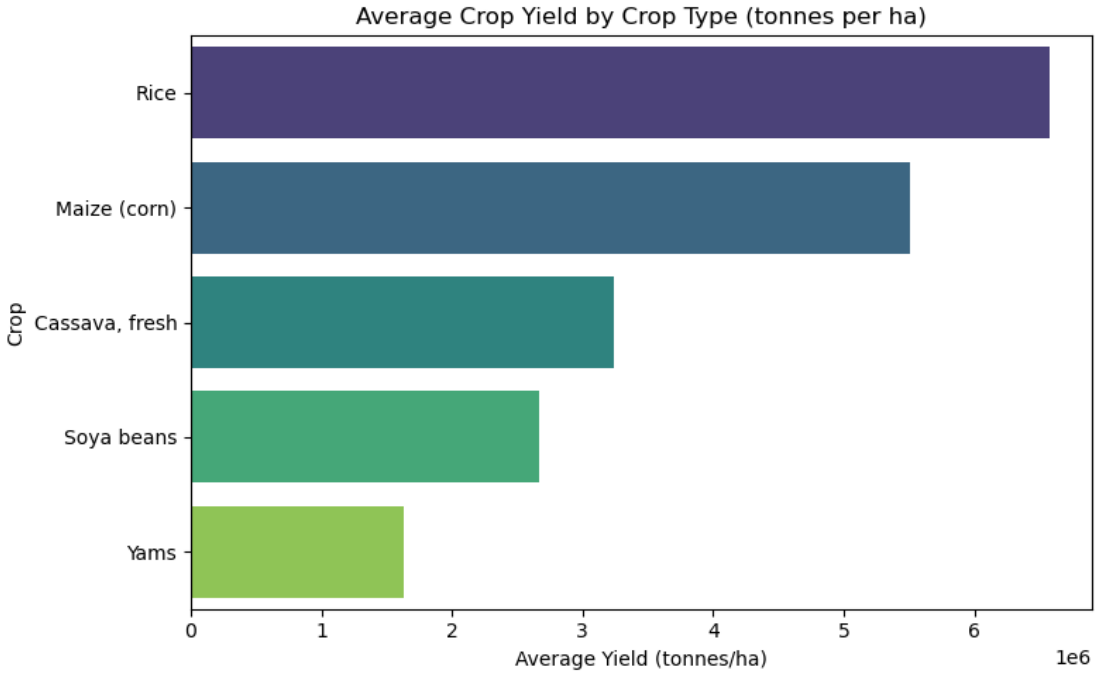


A scatter plot was created to compare the GDP per capita and the undernourishment percentage across data points for Brazil, India, and Nigeria, three major global economies with varying levels of development and food security challenges.



Visualization (Python Scatter plot): Figure 2

This bar chart assesses the average productivity of major global staple crops, measured in tonnes per hectare, providing insight into which crops are the most efficient by land use.



Visualization (Crop Yield Bar Chart): Figure 3

3. Key Insights and Interpretation

1. Undernourishment Reduction is Highest in Developed Economies with Large Agricultural Sectors: The Russian Federation and Australia show the greatest absolute reduction in undernourishment. This trend, which includes other developed nations like Canada and France, suggests that economic stability and high-tech agricultural capabilities are strong drivers for successfully mitigating hunger, even if initial undernourishment rates were low, indicating effective management systems.

2. Low GDP Correlates with High Volatility in Undernourishment: The scatter plot for the selected countries shows that India and Nigeria operate at a significantly lower GDP per capita range than Brazil. Furthermore, data points for India and Nigeria exhibit high variance in undernourishment percentages at low GDP levels, confirming that lower-income countries are more susceptible to sharp fluctuations in food security. Brazil, with higher GDP per capita, shows its undernourishment metrics concentrated at the lower end.

3. Rice and Maize (Corn) Demonstrate Superior Land-Use Efficiency: The yield analysis shows that Rice and Maize (corn) have an average yield that is approximately double that of roots/tubers like Cassava and Yams. This finding is critical for food policy, as it highlights that prioritizing crops with higher per-hectare productivity can be a key strategy for increasing national food availability and strengthening food security.

4. Research Question for Week 4

Does the annual volatility of GDP per capita have a stronger correlation with acute spikes in undernourishment than the average annual GDP per capita in low-income countries?

(Note: The exported CSV files would be submitted separately as part of the deliverable.)