

Challenge: The "Healthy Kids" Nutrition & Growth Analysis

Focuses on the relationship between a child's dietary habits and their physical development, using a realistic, though fictional, dataset.

The Scenario

You are a junior data analyst for a public health organization called "Healthy Futures." The organization has collected data on a sample of children to study the link between their eating habits and growth metrics. Your task is to analyze this data to identify key trends and correlations that can inform future public health campaigns and interventions.

The Data

The dataset is in an Excel workbook named '**Child_Health_Data.csv**'. It contains a sheet named '**Raw_Data**' with the following columns:

- **ChildID**: Unique identifier for each child.
- **Age_Months**: The child's age in months.
- **Gender**: The child's gender (Male/Female).
- **Height_cm**: The child's height in centimeters.
- **Weight_kg**: The child's weight in kilograms.
- **Daily_Fruit_Servings**: Average number of fruit servings per day.
- **Daily_Veggie_Servings**: Average number of vegetable servings per day.
- **Daily_Sugar_Drinks**: Average number of sugary drinks per day.
- **ScreenTime_Hours**: Average daily screen time in hours.
- **Region**: The geographic region where the child lives.

Tasks

1. Data Cleaning and Preparation

- **Format Data as a Table**: Convert the raw data into an **Excel Table** to make it easier to manage and reference.
- **Create Calculated Columns**: Add two new columns to the table:
 - **'BMI'**: Calculate the Body Mass Index using the formula:

$\text{Weightkg}/(\text{Heightcm}/100)^2$

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- **'Health_Status'**: Categorize the child's health based on BMI using a nested IF function. Use the following categories:
 - **Underweight**: BMI < 18.5
 - **Healthy Weight**: BMI between 18.5 and 24.9
 - **Overweight**: BMI between 25.0 and 29.9
 - **Obese**: BMI >= 30.0
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2. Data Analysis and Insights

Use **PivotTables** and **PivotCharts** to answer the following questions. Place each analysis on a new, appropriately named sheet.

- **Health Status by Age Group**: Analyze the distribution of Health_Status across different age groups (e.g., 24-36 months, 37-48 months, etc.). Use a PivotTable and a clustered column chart.
 - **Nutrient Intake vs. BMI**: Create a PivotTable to find the **average BMI for children based on their Daily_Fruit_Servings and Daily_Veggie_Servings**. Use a Slicer for Region to filter the data.
 - **Correlation of Sugar and Screen Time**: Find the average Daily_Sugar_Drinks and ScreenTime_Hours for each Health_Status category. A bar chart would be ideal to visualize this.
 - **Regional Differences**: Use a PivotTable to compare the average BMI and Daily_Fruit_Servings for each Region. Apply **Conditional Formatting** to highlight the highest and lowest values in the table.
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3. Advanced Analysis and Visualization

- **Interactive Dashboard**: Create a new sheet named **'Dashboard'**. This sheet should contain the key PivotCharts from your analysis.
- **Slicers**: Insert **Slicers** for **Gender** and **Health_Status** and connect them to all the charts on the dashboard. This allows for dynamic filtering and exploration of the data.

- **Data Validation:** On a separate sheet, create a data validation dropdown list for the Region column. This demonstrates a good practice for data entry and consistency.
- **Executive Summary:** Create a new sheet named '**Summary**'. In this sheet, write a brief, professional summary of your findings. This summary should highlight the most significant correlations you found between food habits and child growth, and provide at least two actionable recommendations for "Healthy Futures." For example, "Targeted interventions on reducing sugary drink consumption are needed in Region B, as the data shows a strong correlation with higher BMI."