**Problem Statement:**

The aim of this analysis is to explore and visualize a dataset of patients diagnosed with dengue, containing key demographic and hematological parameters, to uncover trends, correlations, and insights that can help in understanding the factors associated with dengue infections. The dataset includes variables such as gender, age, blood cell counts (e.g., hemoglobin, platelet count, WBC, neutrophils, etc.), and the final test result (positive or negative).

The objective is to create an **interactive Power BI dashboard** that provides actionable insights and aids healthcare professionals in identifying key patterns and critical indicators in dengue diagnosis. The dashboard will leverage various advanced visualizations and KPIs to present the data in a clear and comprehensive manner, enabling decision-makers to make data-driven conclusions regarding the disease.

**Key Components of the Dashboard:**

1. **KPIs (Key Performance Indicators):**
   * **Total Positive vs. Negative Results**: Display the count of positive and negative dengue results.
   * **Average Hemoglobin Levels**: Show the average hemoglobin levels for positive vs negative results.
   * **Average Platelet Count**: Present the average platelet count for positive and negative results.
   * **Total WBC Count**: Display the total white blood cell count as an indicator of immune response.
   * **Age Distribution**: Showcase the average age of patients diagnosed with dengue and analyze if age is a factor in test results.
   * **Critical Blood Parameter Flags**: Highlight abnormal values such as low platelet count, low hemoglobin, or abnormal WBC counts.
2. **Key Insights:**
   * **Gender Distribution by Test Result**: Understand how gender influences the likelihood of a positive or negative dengue result.
   * **Age vs Result Correlation**: Identify the age groups that are most likely to test positive or negative for dengue.
   * **Critical Platelet Count and Hemoglobin Levels**: Analyze the distribution of platelet count and hemoglobin in both positive and negative dengue cases.
   * **Blood Parameter Correlation**: Explore how blood parameters (e.g., platelet count, WBC, neutrophils) correlate with the test result, using correlation heatmaps.
3. **Advanced Visualizations:**
   * **Decomposition Tree**: Allow users to drill down into the data to understand how different factors such as gender, age, and blood parameters contribute to the test results.
   * **Heatmap**: Visualize the correlation between key blood parameters (e.g., platelet count, hemoglobin) and the dengue test result to uncover hidden patterns.
   * **Waterfall Chart**: Illustrate how changes in blood parameters impact the likelihood of a positive result, showing step-by-step contributions of factors like platelet count, WBC count, and age.
   * **Clustered Scatter Plot with Trend Line**: Compare key variables (e.g., platelet count vs. hemoglobin, WBC count vs. age) and visualize their relationships, with trend lines for better understanding.
   * **Sankey Diagram**: Display the flow of data from different age and gender groups to positive and negative test results, helping to identify trends.
   * **Time Series Analysis (if applicable)**: Show the trends over time of key variables such as platelet count, WBC count, or hemoglobin levels, helping to detect seasonal patterns or changes in infection rates.
4. **Charts and Graphs:**
   * **Bar/Column Charts**: Display gender distribution, test result counts, and the distribution of critical blood parameters.
   * **Box Plots**: Visualize the range of platelet count and hemoglobin for positive and negative results, helping to identify outliers and abnormalities.
   * **Histogram**: Show the distribution of key variables (e.g., platelet count, age) across positive and negative cases to identify ranges that signify higher risk.
   * **Pie/Donut Charts**: Show the percentage breakdown of test results by gender and other categories.
5. **Interactive Filters and Slicers:**
   * **Age Group Filter**: Allow users to filter the data by age groups (e.g., 0-20, 21-40, 41-60).
   * **Gender Filter**: Filter results by male and female patients to analyze gender-specific trends.
   * **Test Result Filter**: Enable filtering by test result (positive or negative) to focus on specific groups of patients.

**Benefits of the Dashboard:**

* **Comprehensive Data Insights**: The dashboard will provide a comprehensive view of the dataset, uncovering correlations and trends between blood parameters, demographic factors, and dengue results.
* **Advanced Analysis Tools**: Using advanced visualizations such as decomposition trees, heatmaps, and waterfall charts will allow users to interact with the data and uncover hidden patterns, making it easier to identify risk factors.
* **Real-Time Interaction**: The dashboard’s interactive features, such as slicers and filters, will allow users to dynamically drill down into the data and examine the relationships between different variables.
* **Actionable Insights**: Healthcare professionals will be able to make data-driven decisions based on the insights from the dashboard, potentially improving the diagnosis and treatment of dengue cases.
* **Trend Monitoring**: Time series analysis and trend visualization will allow for better monitoring of dengue outbreaks and may help predict future trends.

By incorporating these advanced visualizations and KPIs, the dashboard will serve as a powerful tool for healthcare professionals, allowing them to better understand the factors that contribute to dengue infection, monitor patient health metrics, and make informed decisions regarding patient care and resource allocation.