#### **Documentation for Malaria Data Analysis and Visualization Objective:**

Analyze malaria testing data for children under five (U5) and visualize the results using various plots and maps.

**Prerequisites:**

* Python environment with necessary libraries installed: pandas, matplotlib, geopandas, rasterio, and shapely.
* Dataset in CSV format containing malaria test results.
* A .tiff file containing state boundaries and housing quality data.

1. **How many children under the age of five were tested for malaria with a blood smear test?**
   * This question aims to count the number of children under the age of five who were tested for malaria using a blood smear test. The blood smear test is a common diagnostic tool used to detect malaria parasites in blood samples.

**A screenshot of a computer program

Description automatically generated**

**Output:**

**A graph of a number of children

Description automatically generated**

1. **How many children under the age of five were tested for malaria with a rapid test?**
   * This question seeks to determine the number of children under the age of five who were tested for malaria using a rapid diagnostic test (RDT). RDTs provide quick results and are commonly used in malaria-endemic areas.

A screen shot of a computer code

Description automatically generated

**Output:**

Number of children under the age of five tested for malaria with a rapid test: 10700

1. **How many children tested positive for malaria with a microscopy?**
   * This question aims to identify the number of children who tested positive for malaria using mi.croscopy. Microscopy is considered the gold standard for malaria diagnosis as it allows for the direct visualization of parasites in blood samples.

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**Output**: Number of children under five who tested positive for malaria with microscopy: 0

1. How many children tested positive for malaria with a rapid test?
   * This question seeks to determine the number of children who tested positive for malaria using a rapid diagnostic test. This helps in understanding the prevalence of malaria in the tested population.

A screen shot of a computer program

Description automatically generated

Output:

A graph with a red square

Description automatically generated

1. Make a plot showing the number of U5 children that tested positive for malaria by microscopy and the number of U5 children that tested negative for malaria by microscopy in urban and rural areas.
   * This question aims to visualize the number of children under the age of five who tested positive and negative for malaria by microscopy, categorized by urban and rural areas. This helps in understanding the distribution of malaria cases in different geographical settings.

A screenshot of a computer program

Description automatically generated

Output :

A graph with red and green bars

Description automatically generated

1. Make another plot showing the proportion of U5 children that tested positive for malaria by microscopy and the proportion of U5 children that tested negative for malaria by microscopy in urban and rural areas.
   * This question aims to visualize the proportion of children under the age of five who tested positive and negative for malaria by microscopy, categorized by urban and rural areas. This helps in understanding the relative distribution of malaria cases in different geographical settings.

A screen shot of a computer program

Description automatically generated

Output:

A graph of a bar chart

Description automatically generated with medium confidence

1. **Make a map of the number of children that tested positive for malaria by state.**
   * This question aims to create a map showing the number of children who tested positive for malaria by state. This helps in visualizing the geographical distribution of malaria cases across different states.

**A screen shot of a computer program

Description automatically generated**

**Output:**

**A blue and purple map

Description automatically generated**

1. Make a map showing average housing quality values for each Nigerian state.
   * This analysis creates a map showing the average housing quality values for each Nigerian state. We extract data from a raster file and compute the average housing quality for each state.

**A screen shot of a computer program

Description automatically generated**

**Output:**

**A map of the state of nigeria

Description automatically generated**

**Additional Question: Scrape and Visualize Data from a Website**

This analysis scrapes data from a Wikipedia page containing N. T. Rama Rao's filmography, counts the number of films released each year, and visualizes the data.

**A screenshot of a computer program

Description automatically generated**

**Output:**

**A graph of blue bars

Description automatically generated with medium confidence**