End-to-End Guide for Your SQL Project

Step 1: Setting Up PostgreSQL and pgAdmin 4

1. **Install PostgreSQL:**
   - Download and install PostgreSQL from the official website.
   - During installation, set up a password for the default `postgres` user.
2. **Install pgAdmin 4:**
   - Download and install pgAdmin 4 for a graphical interface to manage your PostgreSQL databases.
3. **Launch pgAdmin 4:**
   - Open pgAdmin 4 and log in using the password you set during the PostgreSQL installation.

Step 2: Creating a Database

1. **Create a New Database:**
   - In pgAdmin 4, right-click on the "Databases" section and select "Create" -> "Database."
   - Name your database (e.g., `zomato_db`) and set the owner to `postgres`.

Step 3: Setting Up Tables

1. **Creating Tables:**
   - In your `zomato_db` database, right-click on "Schemas" -> "Tables" and select "Create" -> "Table."
   - Define your tables according to the schema provided (e.g., `restaurants`, `customers`, `orders`, `riders`, `deliveries`).
   - For each table, specify the columns, data types, and constraints such as primary keys and foreign keys.

Step 4: Importing Data

1. **Prepare Your Data Files:**
   - Ensure that your datasets are in CSV format and structured according to your table schemas.
2. **Import Data Using pgAdmin 4:**
   - Right-click on the desired table and select "Import/Export."
   - Choose the "Import" option, select your CSV file, and map the columns correctly.
   - Execute the import process to populate your tables with data.

Step 5: Checking for Null Values

1. **Identify Null Values:**
    ○ Use pgAdmin 4's query tool to run SQL queries that check for null values in each table.
    ○ Inspect the results to identify columns with missing data.
2. **Handle Null Values:**
    ○ Decide how to handle null values (e.g., impute missing data, remove rows, or flag them for further investigation).

Step 6: Exploratory Data Analysis (EDA)

1. **Explore Your Data:**
    ○ Start by running basic queries to understand your data's structure and distribution.
    ○ Check the range, unique values, and frequency distribution for key columns.
2. **Visualize Data:**
    ○ Create visualizations (e.g., bar charts, histograms) using tools like pgAdmin's built-in options or export the data to Excel or Python for more advanced analysis.

Step 7: Basic Analysis

1. **Basic Queries:**
    ○ Run simple SQL queries to analyze the data, such as counting the number of orders, calculating average order value, and identifying top customers or restaurants.
2. **Summarize Key Metrics:**
    ○ Summarize important metrics like total revenue, number of customers, and total orders.

Step 8: Solving the 20 Business Questions

1. **Review the Business Questions:**
    ○ Refer to the 20 business problems provided. These are designed to test your understanding and application of SQL in a real-world scenario.
2. **Approach Each Problem:**
    ○ For each question, think through the logical steps needed to retrieve and analyze the relevant data.
    ○ Start by identifying the key tables and columns involved.
    ○ Construct your queries step-by-step, testing each part to ensure accuracy.
3. **Document Your Solutions:**
    ○ Keep a record of your SQL solutions for each question. This will be helpful for review and sharing with others.
4. **Publish Your Results:**
    ○ Once you've solved the questions, organize your queries and results into a clear format.
    ○ Consider creating a presentation or report that summarizes your findings.

Step 9: Finalizing the Project

1. **Review and Refine:**
   - Go through your entire project to ensure accuracy and completeness.
   - Double-check your data imports, EDA, and problem solutions.
2. **Publish Your Work:**
   - Upload your project to GitHub, including the SQL scripts, datasets, README file, and any additional documentation.
   - If applicable, create a PowerPoint presentation that showcases your project and findings.
3. **Share and Get Feedback:**
   - Share your project with peers or mentors to get feedback.
   - Use their input to refine your work further.

By following these steps, you'll be able to successfully complete the SQL project, demonstrating your ability to manage data, perform analysis, and solve real-world business problems using SQL.