

## Data Import and Cleaning Steps

These steps provide a structured approach to preparing and manipulating the dataset for subsequent analysis or visualization.

### 1. Install Required Libraries:

- Install Pandas, Zipfile, and Kaggle libraries using pip.

### 2. Import Libraries:

- Import Pandas, Zipfile, and Kaggle libraries.

### 3. Download Kaggle Dataset Programmatically:

- Use the Kaggle API to download the London bike-sharing dataset.

### 4. Extract the Zip File:

- Extract the downloaded zip file using Python's zipfile module.

### 5. Read Data into Pandas DataFrame:

- Use Pandas to read the dataset into a DataFrame.

### 6. Explore the Data:

- Display basic information about the dataset using `info()`.
- Print the shape of the dataset and view the first few rows.

### 7. Assess Unique Values in Columns:

- Check unique values in specific columns like 'weather\_code' and 'season'.

## 8. Rename Columns:

- Rename columns for better clarity using a dictionary.

## 9. Data Manipulation:

- Convert humidity percent to actual humidity values.
- Map numerical values to meaningful labels for 'season' and 'weather'.

## 10. Verify Data Manipulation:

- Double-check the mappings for 'season' and 'weather'.

## 11. Write Final Data to Excel File:

- Save the modified DataFrame to an Excel file for further analysis.

## Visualization Process

This documentation covers the steps to create the visualizations in Tableau, including the moving average chart, total bike rides chart, temperature vs. wind speed heat map, and tooltip visualizations.

### Step 12: Create Total Number of Bike Rides Chart

- Duplicate the "Moving Average" worksheet by right-clicking on the tab and selecting "Duplicate."
- Rename the duplicated worksheet to "Total Bike Rides."
- Remove the existing calculated field "Moving Average Right" from the Color shelf.
- Drag the "Count" field to the Rows shelf.
- Add "time" to the Columns shelf and set it to "Exact Date."
- Right-click on the "Count" axis, choose "Dual Axis," and synchronize the axes.
- Customize the chart title, axis titles, and formatting as needed.

### Step 13: Create Temperature vs. Wind Speed Heat Map

- Create a new worksheet and name it "Temperature vs. Wind Speed Heat Map."
- Drag "real\_temperature" to Columns and "wind\_speed" to Rows.
- Drop "Count" onto Color to represent the intensity of bike rides.
- Adjust the color palette and formatting as desired.

### Step 14: Create Tooltip Visualizations

- In the "Moving Average" worksheet, click on the Tooltip shelf.
- Add "weather" and "hour" to the Tooltip shelf to display additional information.

### Step 15: Add Filters

- In the "Moving Average" worksheet, add the "time" field to the Filters shelf.
- Adjust the filter settings to customize the timeline.

## Step 16: Set Actions for Interactive Dashboard

- Go to the Dashboard tab and create a new dashboard.
- Drag the "Moving Average" worksheet and "Total Bike Rides" worksheet onto the dashboard.
- Create a set action to update the moving average period set when interacting with the chart.
- Create a filter action to filter the timeline based on user interactions.

## Step 17: Final Formatting and Design

- Adjust the formatting of titles, legends, and axes for a clean and professional look.
- Customize colors, fonts, and other visual elements to create a cohesive design.