Exercise 1: Basic Histogram

Objective: Create a simple histogram with the following data points:

$$(1, 3), (2, 6), (3, 10), (4, 7), (5, 4)$$

- Label the x-axis as "Value" and the y-axis as "Frequency".
- Add a title: "Basic Histogram".

Exercise 2: Histogram from CSV Data

Objective: Create a histogram by reading data from a CSV file. Create a CSV file 'data.csv' with the following content:

$$\text{Value,Frequency} 1, 82, 123, 154, 105, 6$$

- Write the LaTeX code to read the CSV file and plot the histogram.
- Label the axes and add a title: "Histogram from CSV Data".

Exercise 3: Customized Histogram

Objective: Create a histogram with the following data:

$$(1, 5), (2, 10), (3, 8), (4, 12), (5, 9)$$

Customize the histogram by:

- Setting the bar width to 0.5 cm.
- Filling the bars with blue color.
- Displaying the data values near the bars.
- Adding a grid to the background.

Exercise 4: Histogram with Automatic Binning

Objective: Create a histogram with the following data points:

$$1, 2, 3, 3, 4, 5, 6, 6, 6, 7, 8, 9, 9, 10$$

- Automatically bin the data into 5 bins.
- Label the axes and add a title: "Histogram with Automatic Binning".

Exercise 5: Multiple Histograms on One Plot

Objective: Plot two histograms on the same axis for comparison:

- Data Set 1: $(1, 4), (2, 7), (3, 8), (4, 6), (5, 9)$
- Data Set 2: $(1, 3), (2, 5), (3, 9), (4, 7), (5, 6)$
- Ensure that the histograms are distinguishable, using different colors or styles.
- Label the axes and add a title: "Multiple Histograms".

Exercise 6: Logarithmic Scale Histogram

Objective: Create a histogram using the following data:

$$(1, 5), (2, 50), (3, 500), (4, 5000), (5, 50000)$$

- Use a logarithmic scale for the y-axis.
- Label the axes and add a title: "Logarithmic Histogram".

Exercise 7: Custom Bin Ranges

Objective: Create a histogram using the following data:

$$1, 2, 3, 3, 3, 4, 4, 5, 5, 6, 7, 7, 8, 9, 10$$

- Bin the data into 3 custom bins:
  - Bin 1: 1–3
  - Bin 2: 4–6
  - Bin 3: 7–10
- Label the axes and add a title: "Custom Binned Histogram".

Exercise 8: Histogram with Different Bar Width

Objective: Create a histogram with the following data:

$$(1, 6), (2, 10), (3, 12), (4, 9), (5, 7)$$

- Set the bar width to 20pt.
- Label the axes and add a title: "Histogram with Custom Bar Width".

Exercise 9: Comparing Two Datasets

Objective: Compare two datasets with histograms on the same plot:

- Data Set 1: $(1, 3), (2, 5), (3, 7), (4, 9), (5, 12)$
- Data Set 2: $(1, 4), (2, 6), (3, 8), (4, 10), (5, 14)$
- Use two different colors to represent each dataset.
- Label the axes and add a title: "Comparison of Two Datasets".

Exercise 10: Histogram with Percentages

Objective: Create a histogram that shows percentages instead of absolute frequencies. Use the following data:

$$1, 2, 3, 3, 4, 5, 6, 6, 7, 8$$

- Normalize the data so that the sum of all the bars equals 100%.
- Label the axes and add a title: "Percentage Histogram".