

TYPES OF DATA VISUALIZATION

PRESENTED BY GOWTHAM

DATA VISUALIZATION



Data visualization is the practice of translating data into visual formats like charts, graphs, and maps to make complex information more accessible and understandable to the human brain

Its fundamental purpose is to distill large datasets into a clear and concise visual story, enabling viewers to quickly identify trends, patterns, and outliers that might be missed in raw text or spreadsheets

TYPES OF DATA VISUALIZATION

1.Distribution plot

2.Box and whisker plot

3.Violin plot

4.Line plot

5.Bar plot

6.Scatter plot

7.Histogram

8.Pie chart

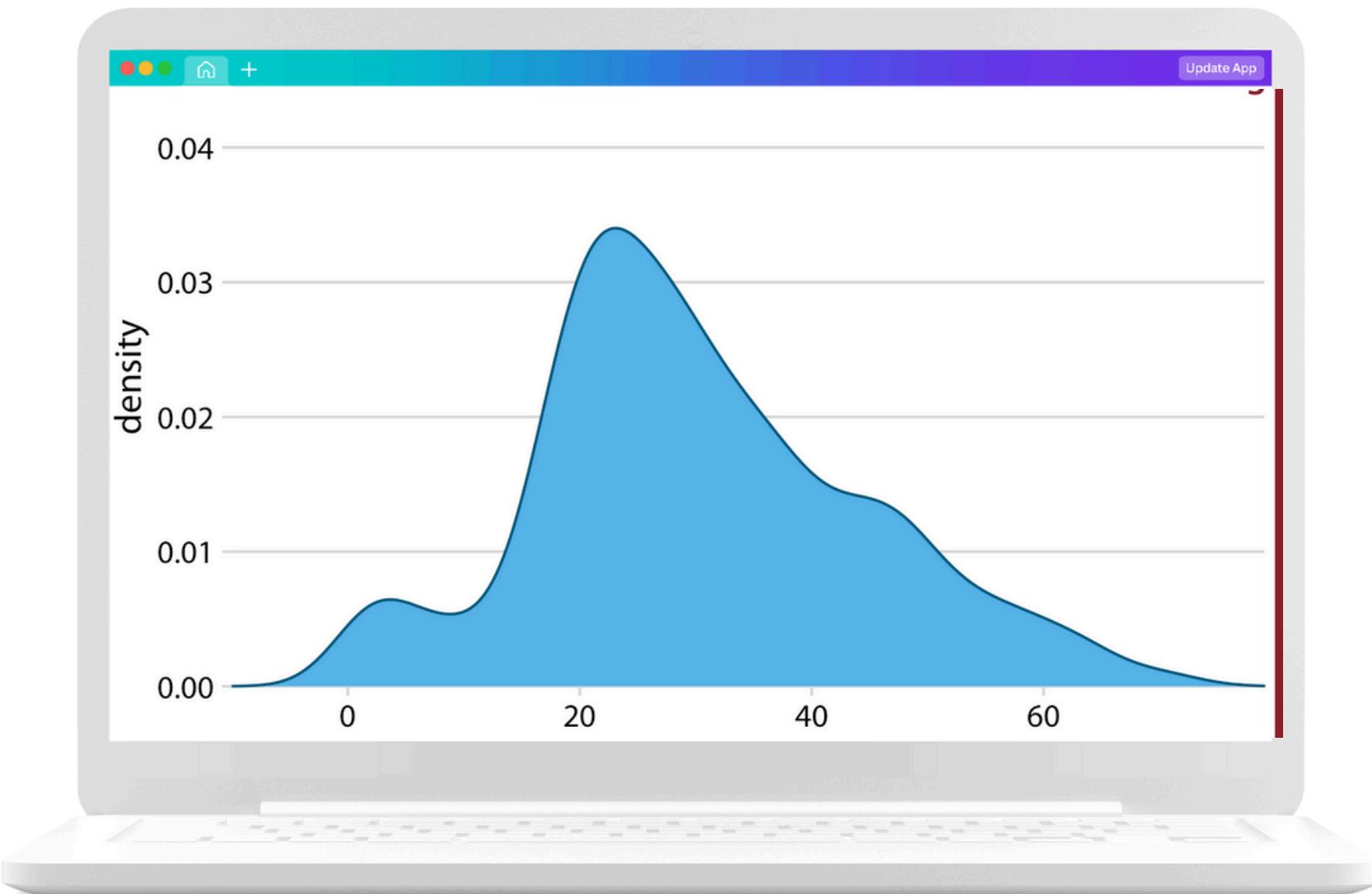
9.Area plot

10.Hexbin plot

11.Heatmap

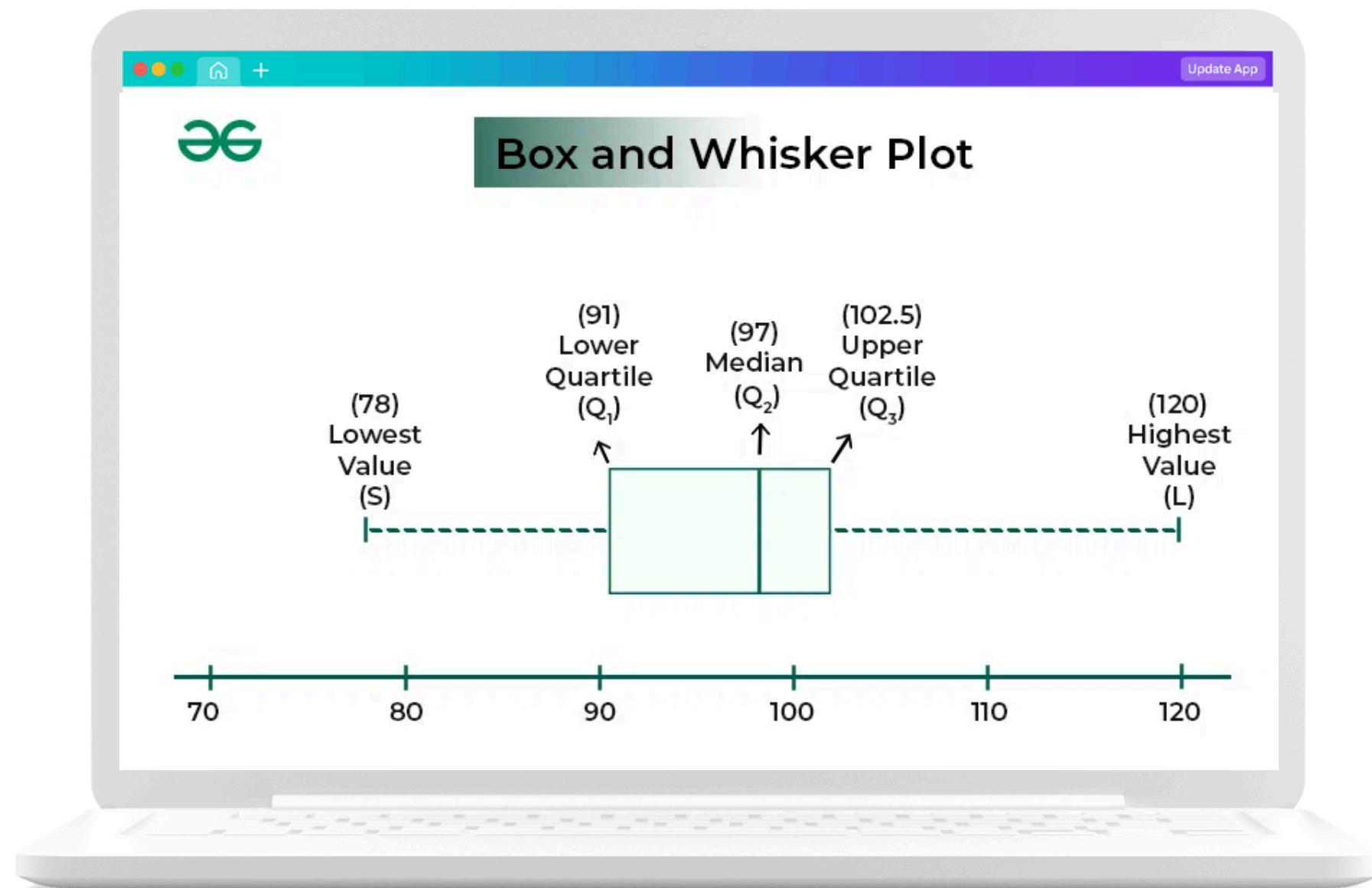
Distribution plot

- What it is: A general term for a plot that shows the frequency and spread of numerical data. Common types include histograms and density plots.
- Where it's used: To understand the underlying distribution of a single variable, like the distribution of test scores or customer ages.
- How it's helpful: It quickly reveals the data's central tendency (mean, median), spread (variance), and shape (e.g., bell-curved, skewed, bimodal).



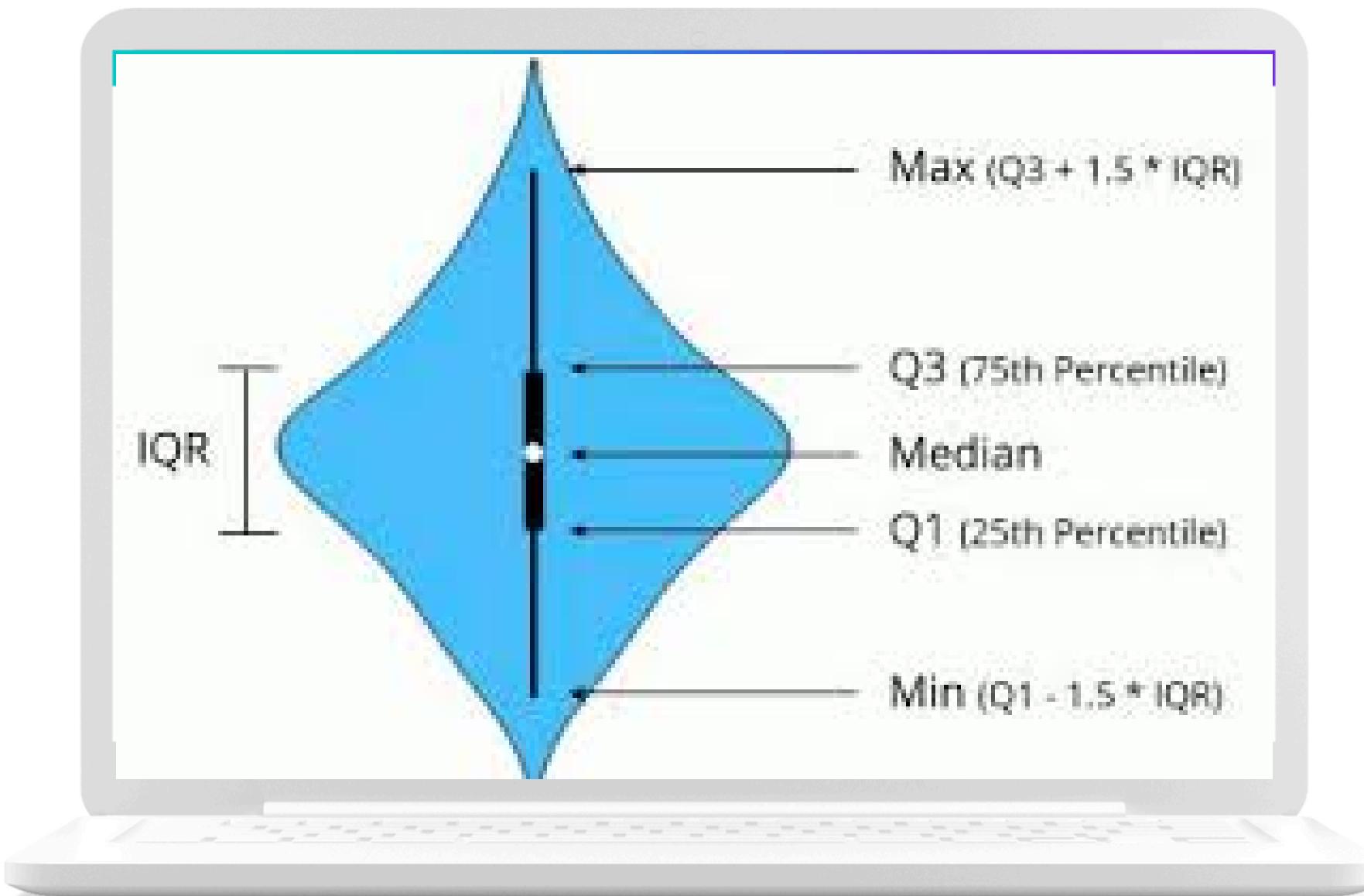
Box and whisker plot

- What it is: A standardized way of displaying the distribution of data based on a five-number summary: minimum, first quartile (Q1), median, third quartile (Q3), and maximum.
- Where it's used: Excellent for comparing the distributions of a numerical variable across multiple groups (e.g., comparing salaries across different departments).
- How it's helpful: It provides a compact summary of the data's spread and skewness and is very effective for spotting outliers.



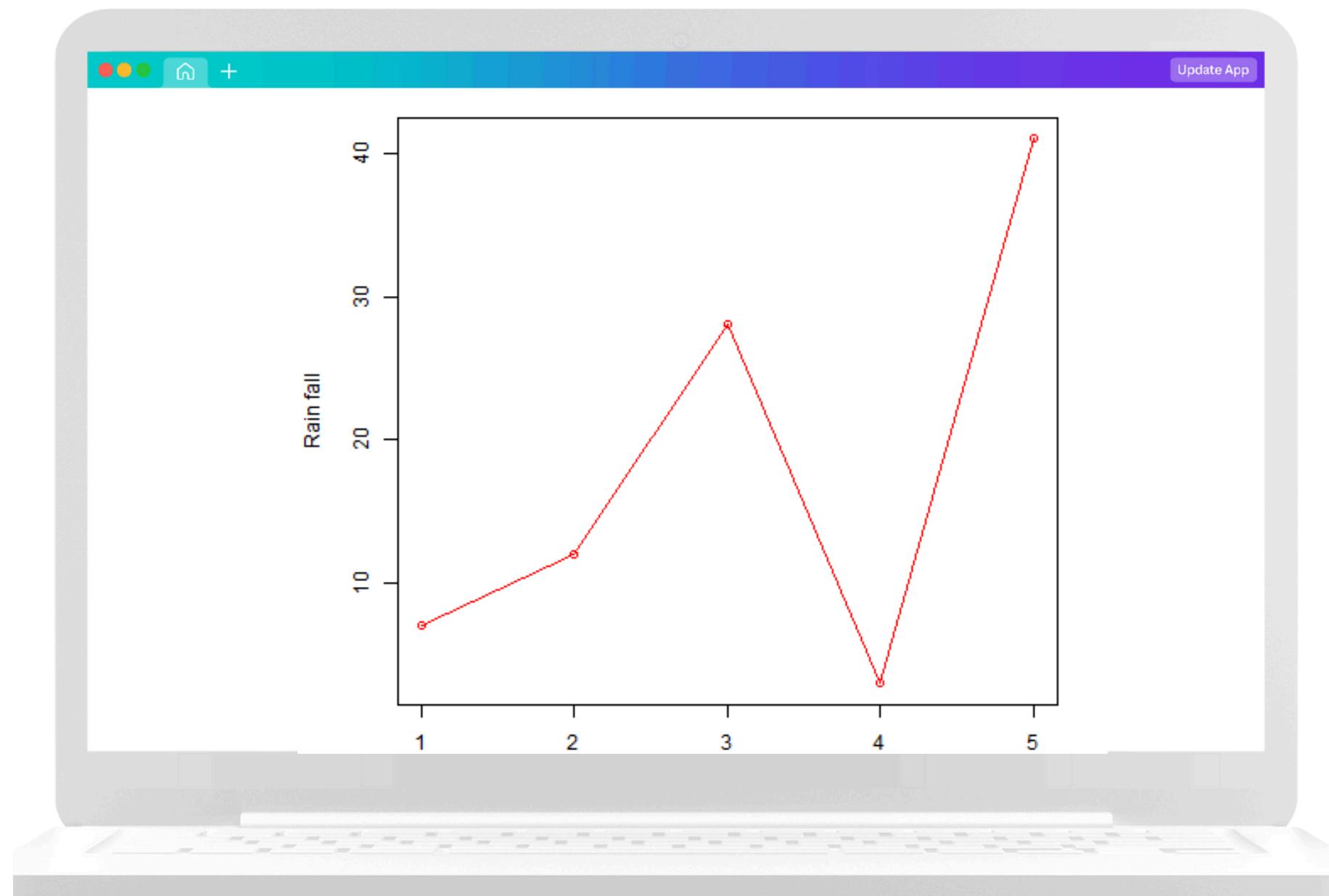
3. Violin plot

- What it is: A hybrid of a box plot and a density plot. It shows the five-number summary like a box plot, but also includes a rotated density plot on each side.
- Where it's used: To compare the distribution of numerical data between different groups, especially when you want to see more detail than a box plot provides.
- How it's helpful: It visualizes both the summary statistics and the full density of the data, revealing more complex distributions with multiple peaks that a box plot might hide.



4. Line plot

- What it is: A chart that displays data points connected by straight line segments.
- Where it's used: Primarily for visualizing data that changes over a continuous interval, such as time. Common examples include tracking stock prices or monthly temperatures.
- How it's helpful: It's excellent for showing trends, patterns, and fluctuations in data over time.



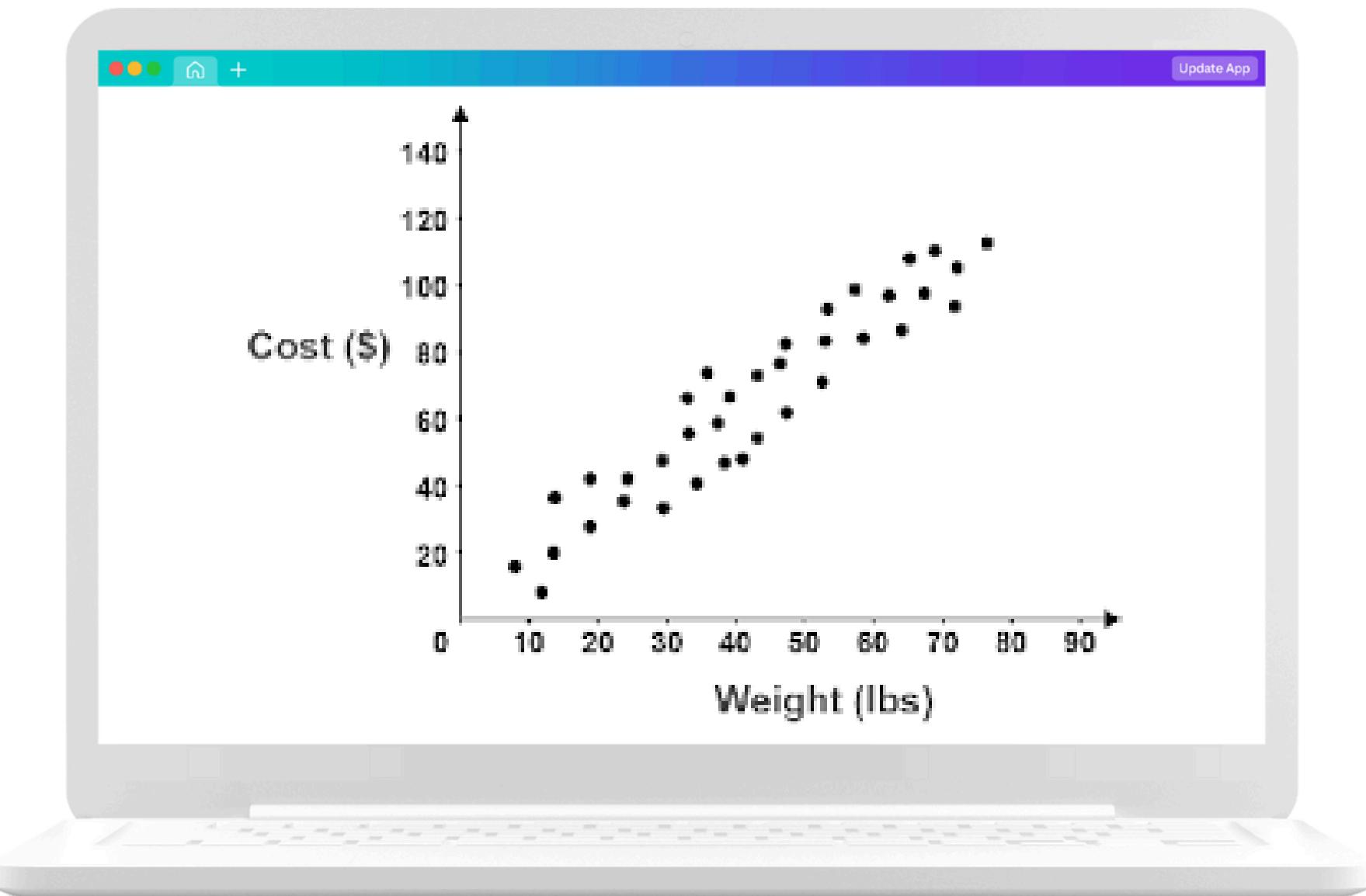
5. Bar plot

- What it is: A chart that uses rectangular bars to represent values for different categories. The bar lengths are proportional to the values.
- Where it's used: To compare discrete categories of data, such as sales figures for different products or the population of various cities.
- How it's helpful: It makes it very easy to compare quantities across different groups at a glance.



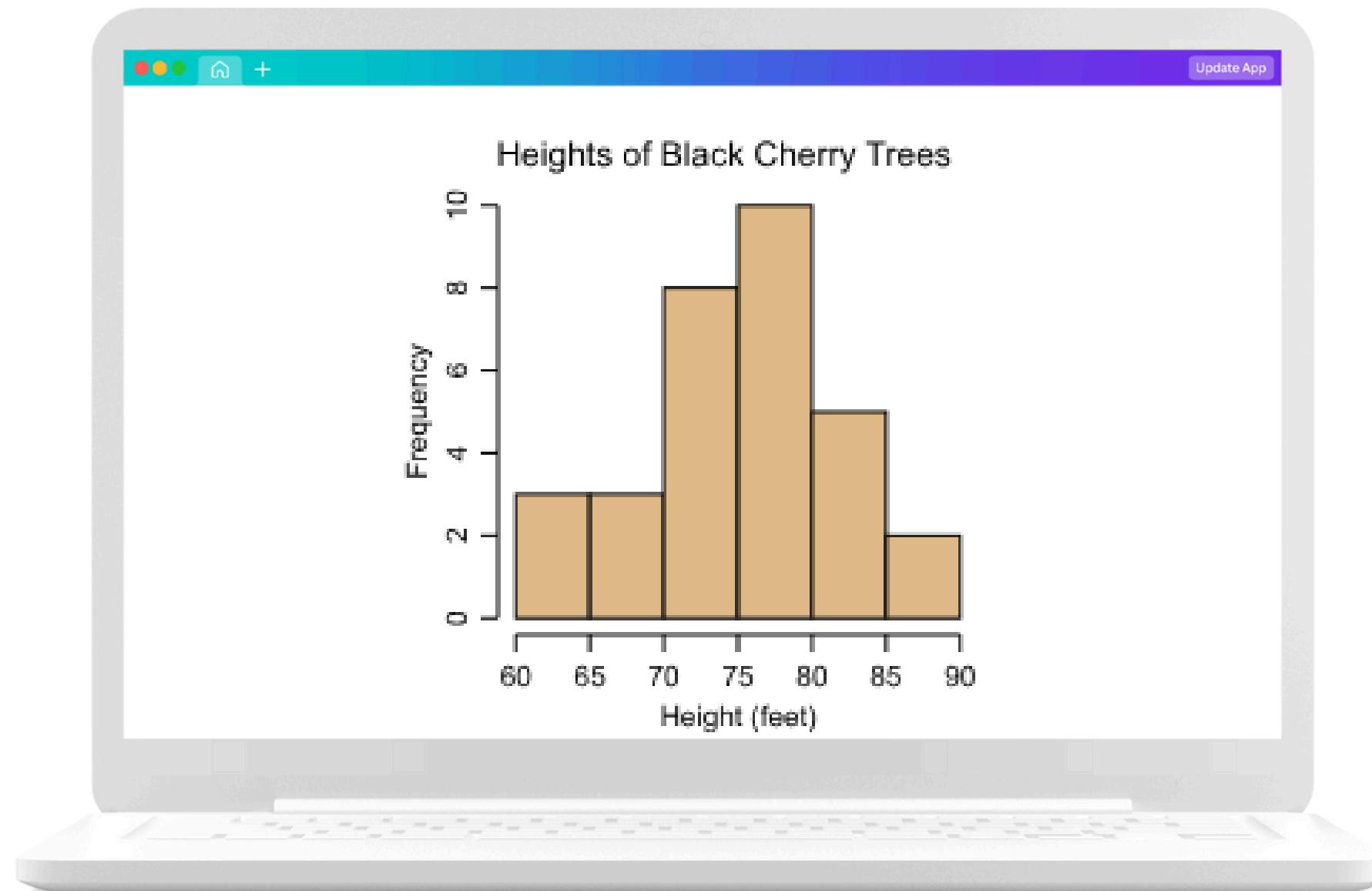
6.Scatter plot

- What it is: A plot that uses dots to represent the values for two different numeric variables. Each dot's position on the horizontal (x-axis) and vertical (y-axis) corresponds to its values.
- Where it's used: To investigate the relationship and correlation between two variables (e.g., advertising spend vs. sales, or height vs. weight).
- How it's helpful: It's the best way to see the strength and direction of a relationship (positive, negative, or none) and to identify clusters and outliers.



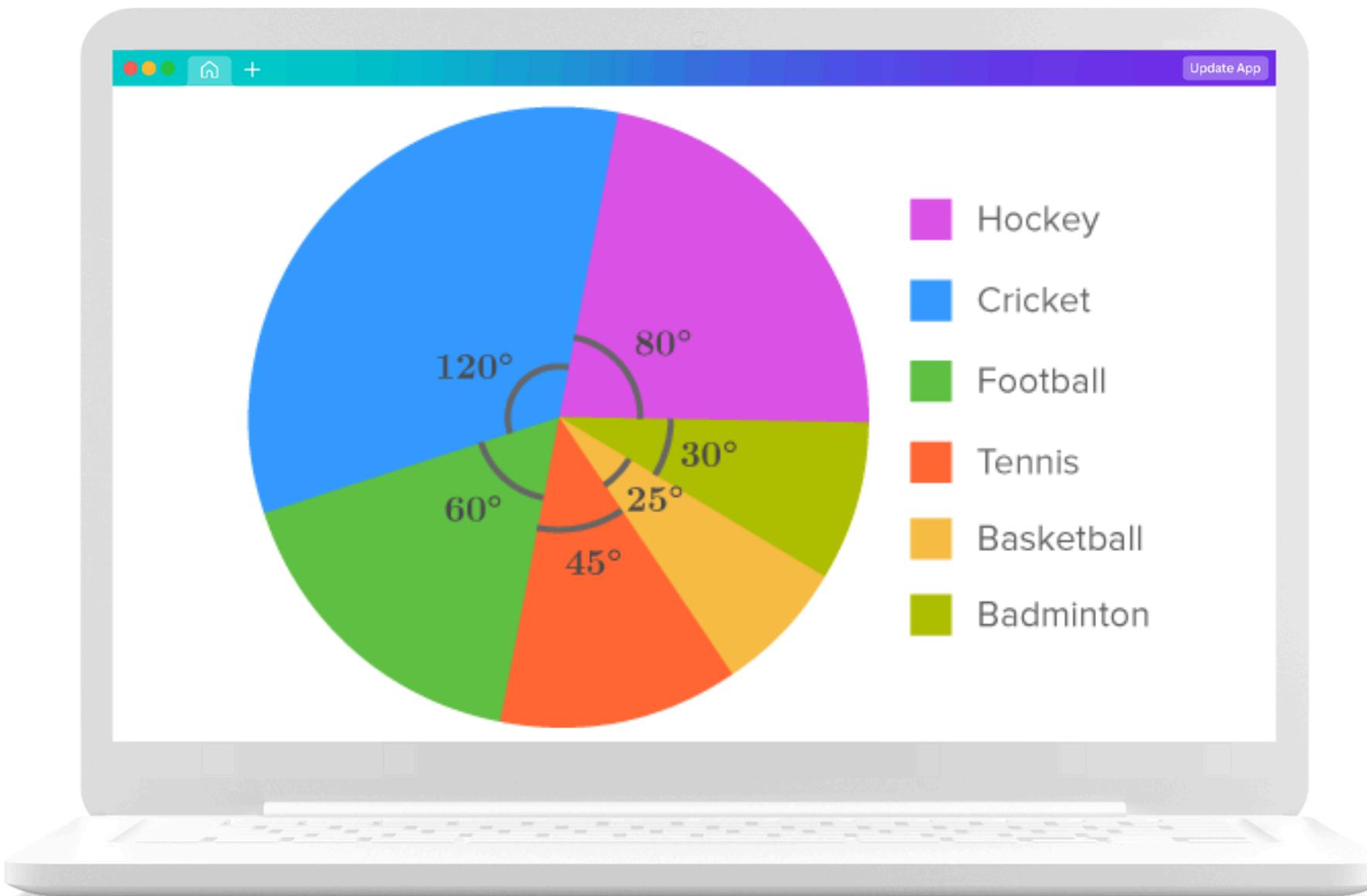
7. Histogram

- What it is: A specific type of bar plot that shows the frequency distribution of a single continuous variable by grouping the data into numerical ranges called "bins."
- Where it's used: To understand the shape of your data's distribution. For example, plotting the distribution of heights in a population.
- How it's helpful: Unlike a standard bar plot, a histogram reveals the underlying frequency distribution of a set of continuous data.



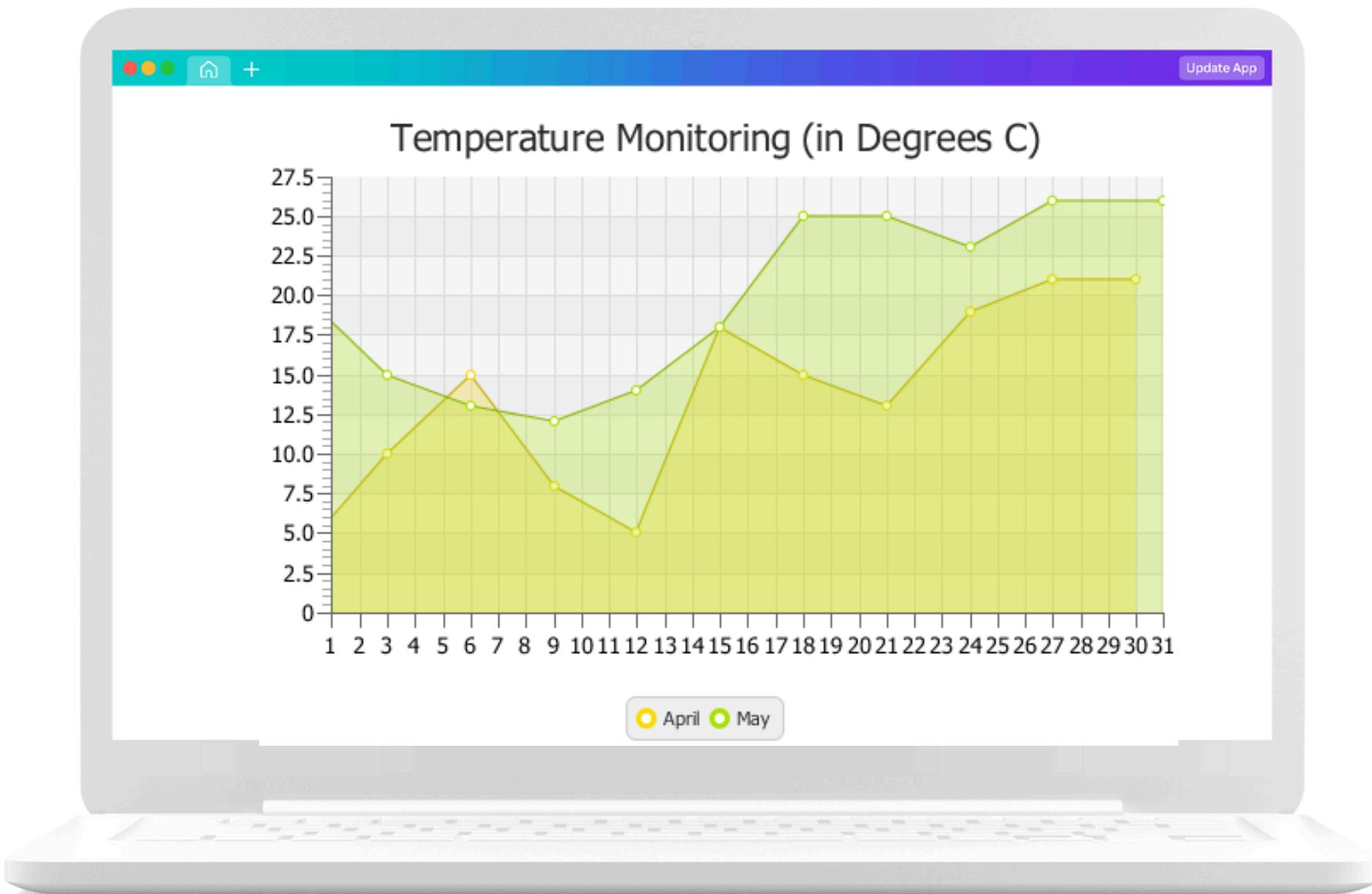
8.Pie chart

- What it is: A circular chart divided into slices to illustrate numerical proportion. Each slice represents a percentage of the whole.
- Where it's used: To show the composition or breakdown of a whole into its parts, such as market share or budget allocations. It's best used with a small number of categories.
- How it's helpful: It provides an immediate, intuitive understanding of how different parts contribute to a whole.



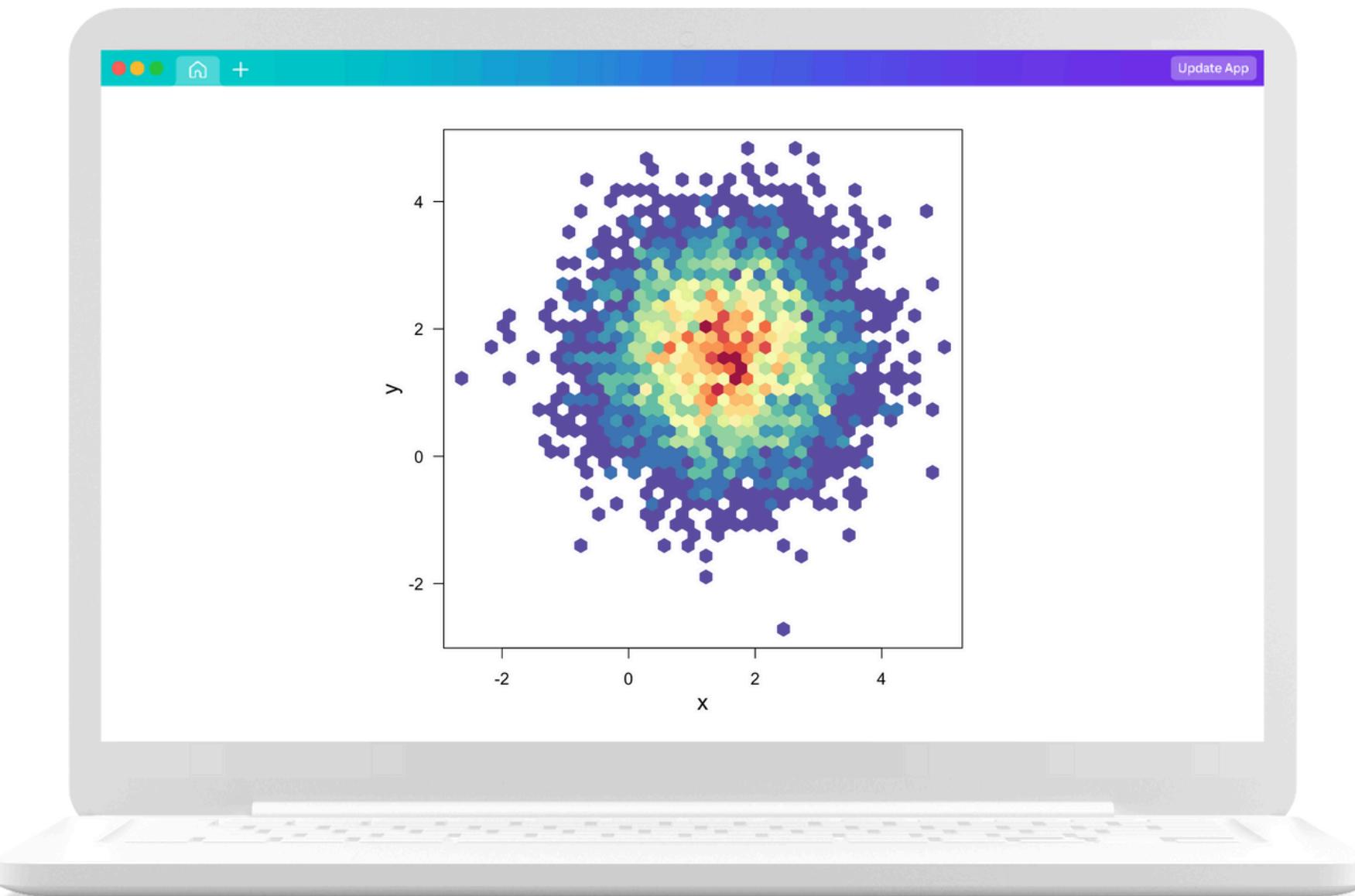
9. Area plot

- What it is: Similar to a line plot, but the area between the line and the axis is filled with color. A "stacked" area plot can show how different components make up a cumulative total.
- Where it's used: To visualize changes in volume or cumulative totals over time, such as tracking total sales and the contribution of different product lines over several years.
- How it's helpful: It's great for showing part-to-whole relationships over time and emphasizing the magnitude of change.



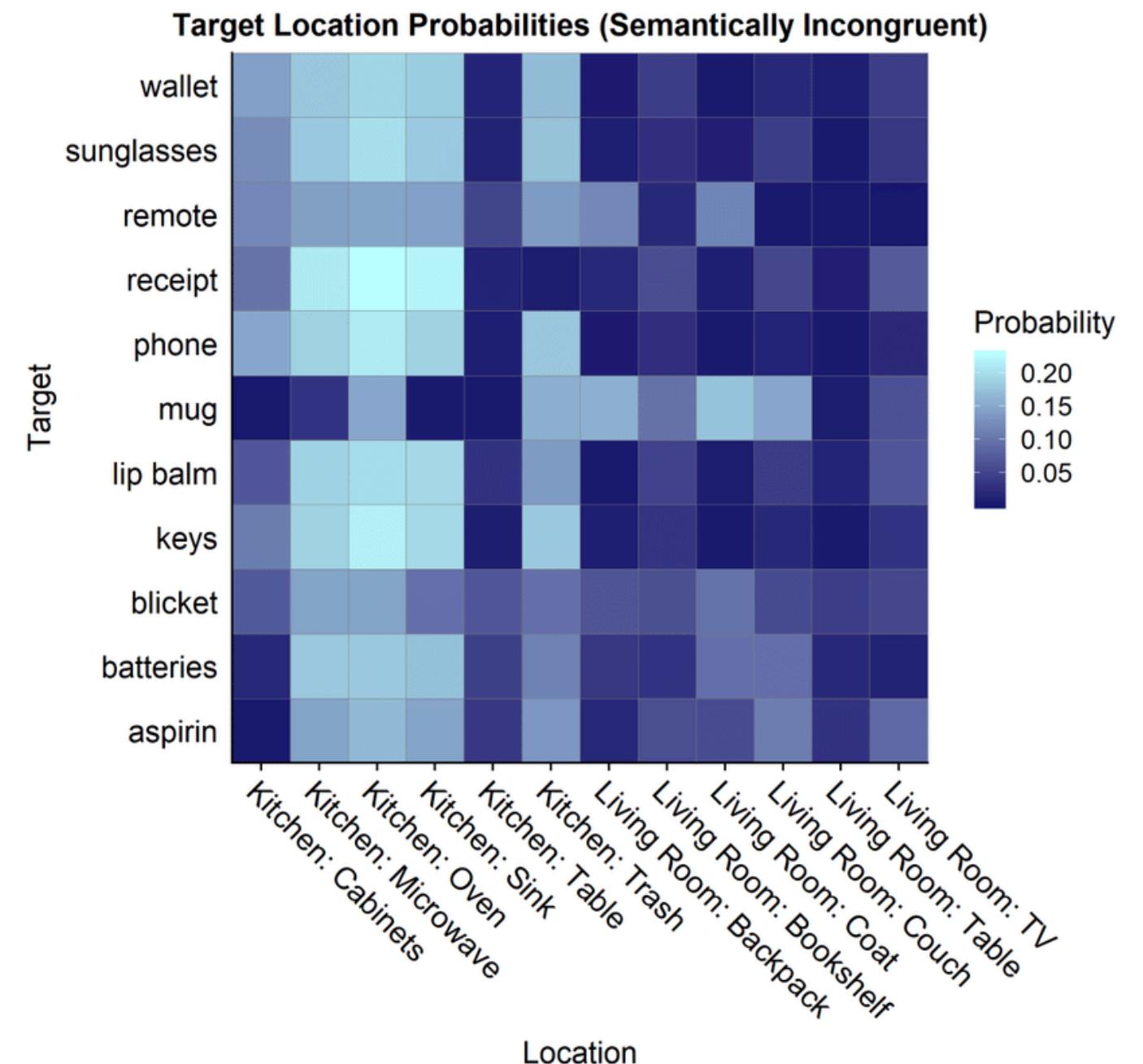
10. Hexbin plot

- What it is: A variation of a scatter plot for visualizing very large datasets. It groups data points into hexagonal bins and uses color to show how many points fall into each bin.
- Where it's used: For dense scatter plots where individual points would overlap and hide the underlying data distribution (a problem called overplotting).
- How it's helpful: It effectively visualizes the density of data points in a 2D space, making it easy to see where data is most concentrated.



11. Heatmap

- What it is: A graphical representation of data where values in a matrix are represented as colors.
- Where it's used: To visualize complex data tables, such as correlation matrices between variables, user activity on a website, or gene expression data.
- How it's helpful: It uses color to instantly draw attention to high and low values, making it very effective for identifying patterns and clusters in large matrices of data.



**Thank you
very much!**