Sheth L.U.J. & Sir M.V. College

Practical 10 :- Creating Graphical Reports using ggplot2 ®

Aim :- To create graphical reports using ggplot2 in R for better data visualization and interpretation. The following graphs are generated:

1. Scatter Plot

2. Pie Chart

3. High–Low Chart

Dataset Description

The dataset is loaded from an external CSV file and contains the following important variables:

Variable Name	Description
Date	Date of transaction
Product.Category	Category of product (Electronics, Clothing, Beauty)
Quantity	Number of items purchased
Total.Amount	Total sales amount

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Graph 1: Scatter Plot (Quantity vs Total Amount)

Scatter Plot: Quantity vs Total Amount
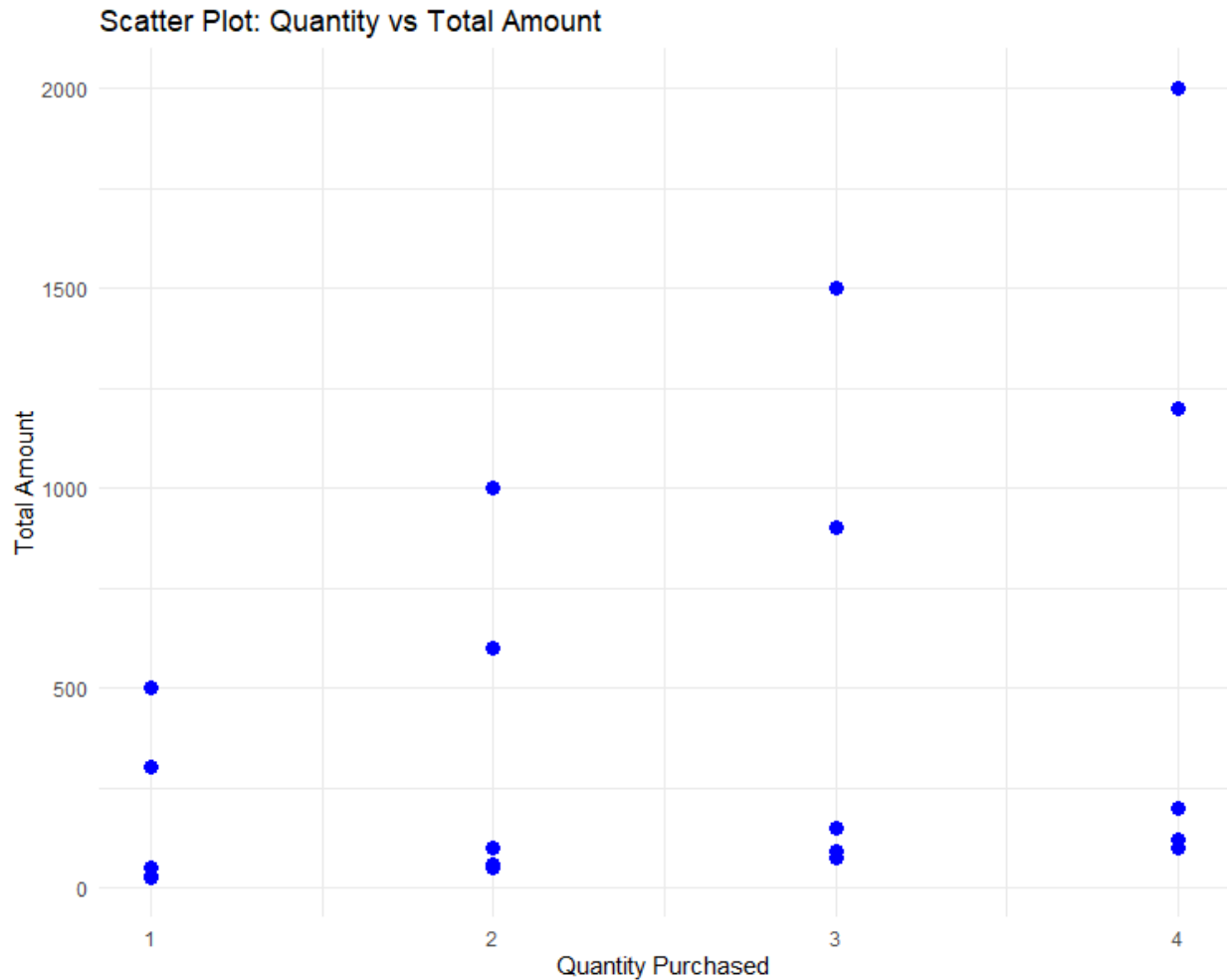
Explanation

- This scatter plot shows the relationship between quantity purchased and total sales amount.

- As the quantity increases, the total amount generally increases.
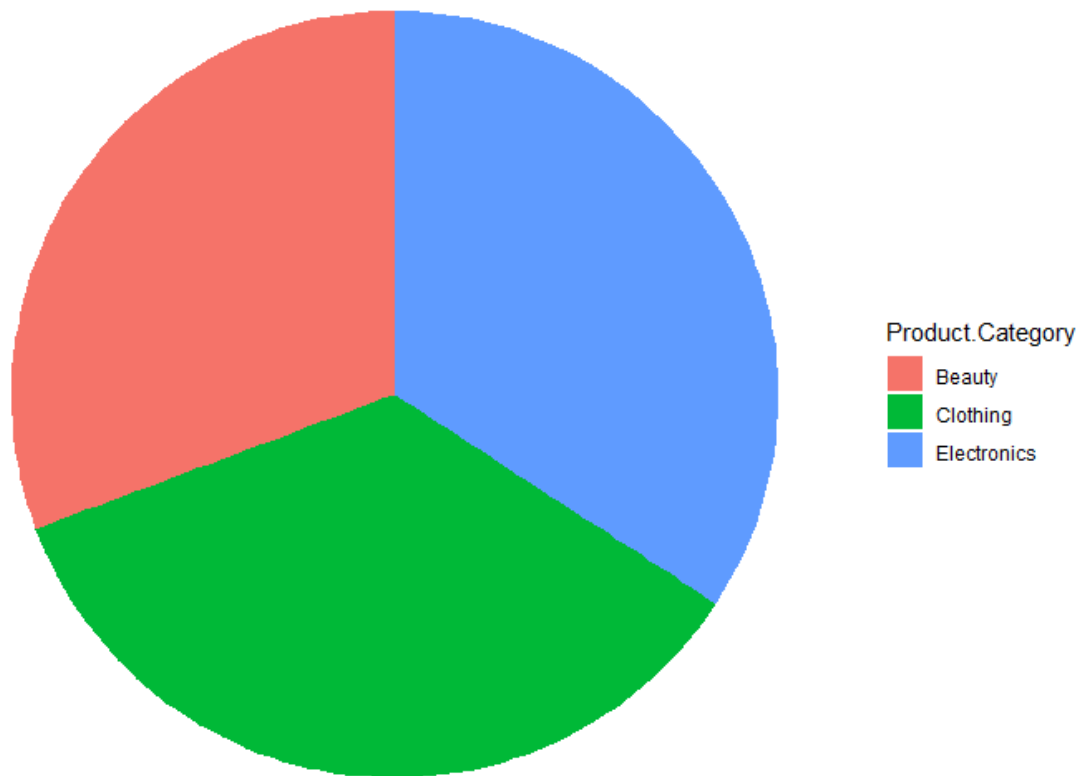
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- Higher quantities (3 and 4) show greater variation, indicating bulk purchases lead to higher sales values.

- The plot helps identify patterns and outliers in sales data.

Graph 2: Pie Chart (Product Category Distribution)

Pie Chart: Product Category Distribution

Product.Category
- Beauty
- Clothing
- Electronics
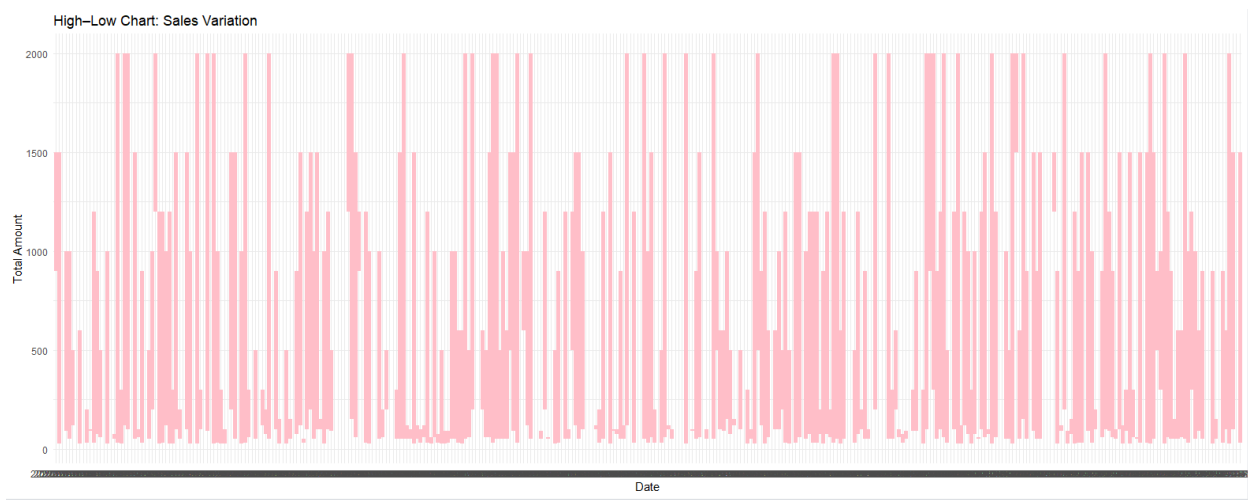
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Explanation

- The pie chart represents the distribution of sales across product categories.

- Electronics, Clothing, and Beauty categories contribute almost equally.

- This indicates balanced sales performance across all categories.

- Useful for understanding which category dominates the market share.

Graph 3: High–Low Chart (Sales Variation Over Time)

High–Low Chart: Sales Variation

Total Amount

Date

Explanation

- The High–Low chart shows daily sales variation.

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- The lower end represents minimum sales, and the upper end shows maximum sales per day.

- Light color improves readability and avoids visual clutter.

- This chart helps identify volatile and stable sales periods.

Overall Observations

- Scatter plot confirms a positive relationship between quantity and total amount.

- Pie chart shows even distribution across product categories.

- High–Low chart highlights sales fluctuations over time, useful for trend analysis.

Conclusion

This practical demonstrates the use of ggplot2 for creating meaningful visualizations.
 Graphical representation improves understanding of data patterns, trends, and distributions, making analysis more effective and interpretable.
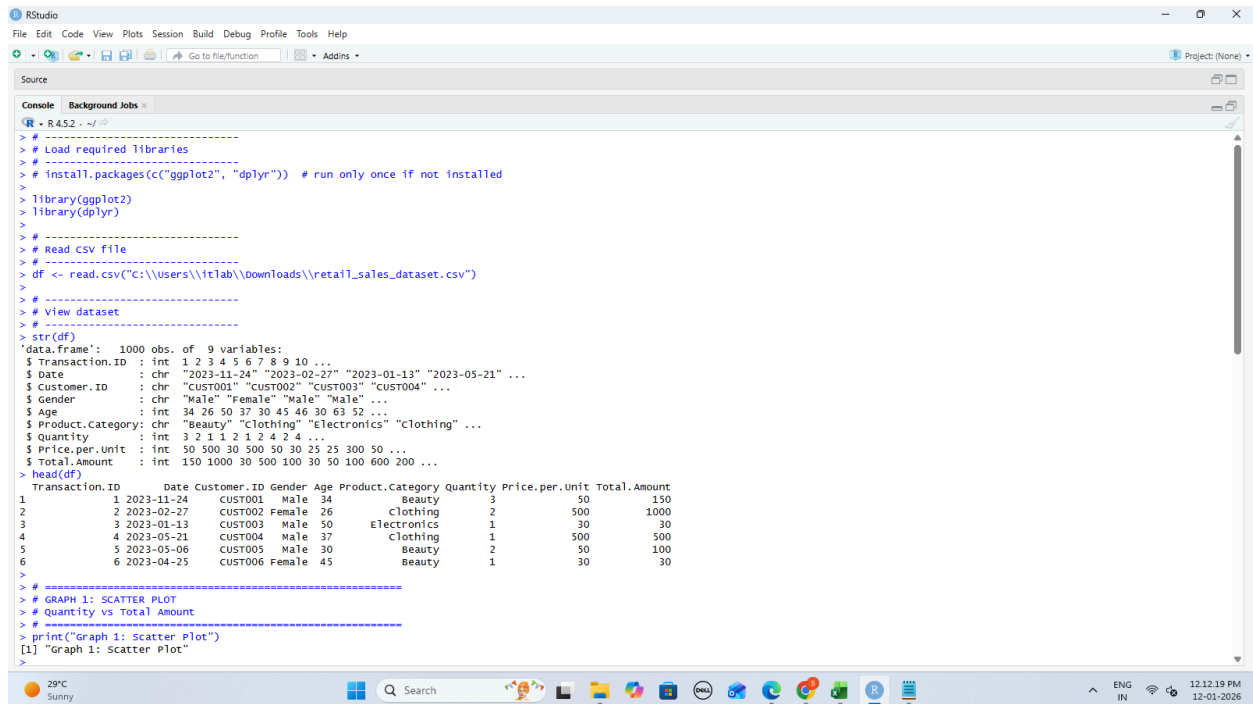
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Result

Scatter Plot, Pie Chart, and High–Low Chart were successfully created using ggplot2, and the sales data was analyzed visually.
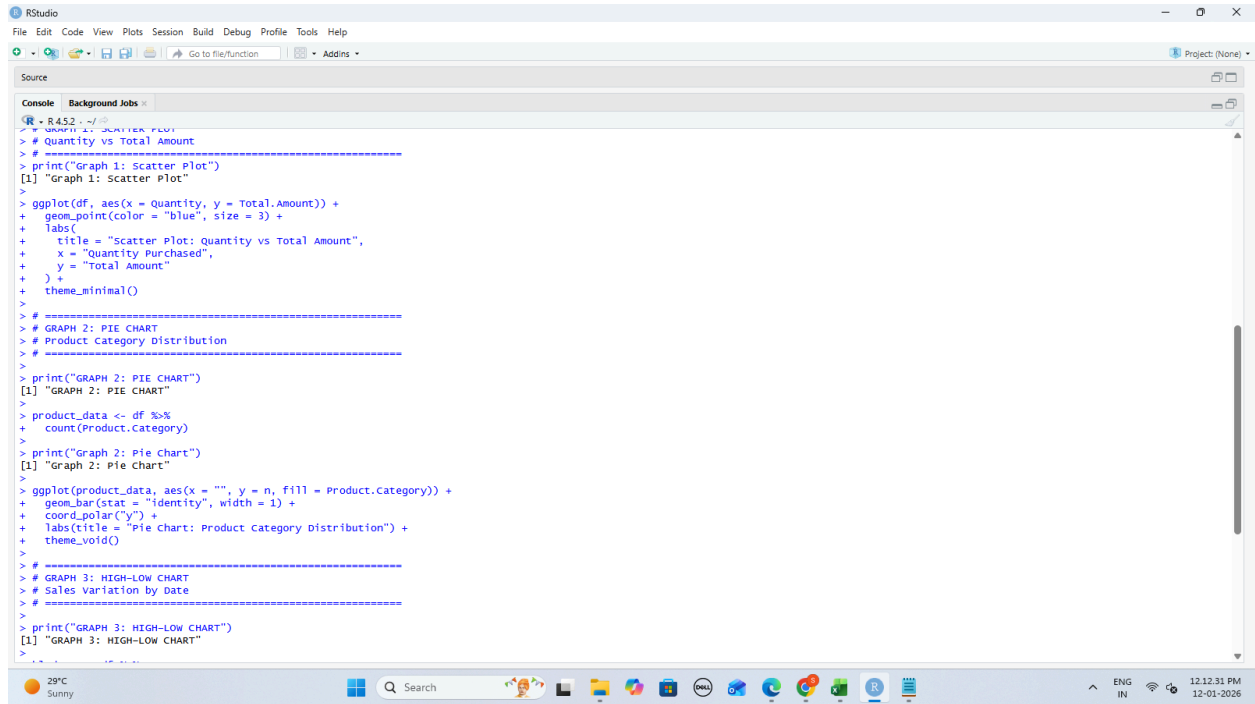
Screenshots

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```
> # GRAPH 1: SCATTER PLOT
> # Quantity vs Total Amount
> # ======================================================
> print("Graph 1: Scatter Plot")
[1] "Graph 1: Scatter Plot"
>
> ggplot(df, aes(x = Quantity, y = Total.Amount)) +
+   geom_point(color = "blue", size = 3) +
+   labs(
+     title = "Scatter Plot: Quantity vs Total Amount",
+     x = "Quantity Purchased",
+     y = "Total Amount"
+   ) +
+   theme_minimal()
>
> # ======================================================
> # GRAPH 2: PIE CHART
> # Product Category Distribution
> # ======================================================
>
> print("GRAPH 2: PIE CHART")
[1] "GRAPH 2: PIE CHART"
>
> product_data <- df %>%
+   count(Product.Category)
> print("Graph 2: Pie Chart")
[1] "Graph 2: Pie Chart"
>
> ggplot(product_data, aes(x = "", y = n, fill = Product.Category)) +
+   geom_bar(stat = "identity", width = 1) +
+   coord_polar("y") +
+   labs(title = "Pie Chart: Product Category Distribution") +
+   theme_void()
>
> # ======================================================
> # GRAPH 3: HIGH-LOW CHART
> # Sales Variation by Date
> # ======================================================
>
> print("GRAPH 3: HIGH-LOW CHART")
[1] "GRAPH 3: HIGH-LOW CHART"
>
```

```
+   count(Product.Category)
>
> print("Graph 2: Pie Chart")
[1] "Graph 2: Pie Chart"
>
> ggplot(product_data, aes(x = "", y = n, fill = Product.Category)) +
+   geom_bar(stat = "identity", width = 1) +
+   coord_polar("y") +
+   labs(title = "Pie Chart: Product Category Distribution") +
+   theme_void()
>
> # ======================================================
> # GRAPH 3: HIGH-LOW CHART
> # Sales Variation by Date
> # ======================================================
>
> print("GRAPH 3: HIGH-LOW CHART")
[1] "GRAPH 3: HIGH-LOW CHART"
>
> hl_data <- df %>%
+   group_by(Date) %>%
+   summarise(
+     High = max(Total.Amount, na.rm = TRUE),
+     Low  = min(Total.Amount, na.rm = TRUE)
+   )
>
> print("Graph 3: High-Low Chart")
[1] "Graph 3: High-Low Chart"
>
> ggplot(hl_data, aes(x = Date)) +
+   geom_linerange(
+     aes(ymin = Low, ymax = High),
+     color = "pink",
+     size = 2
+   ) +
+   labs(
+     title = "High-Low Chart: Sales Variation",
+     x = "Date",
+     y = "Total Amount"
+   ) +
+   theme_minimal()
> |
```

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