

# Trash Wheel Collection Data

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COMP5120 Data Visualization

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# Trash wheel dataset

- From the Mr. Trash Wheel Baltimore Healthy Harbor
- Data collection involves manual counting of items on conveyor paddles during dumpster filling
- Contains diverse data attributes: trash weight, volume
- Contains specific item counts: plastic bottles and cigarette butts
- Offers an invaluable opportunity to explore environmental issues through data visualization

# Data Dimensions of the Dataset



| variable       | class     | description  |
|----------------|-----------|--|
| ID             | character | Short name for the Trash Wheel   |
| Name           | character | Name of the Trash Wheel  |
| Dumpster       | double    | Dumpster number  |
| Month          | character | Month  |
| Year           | double    | Year   |
| Date           | character | Date   |
| Weight         | double    | Weight in tons   |
| Volume         | double    | Volume in cubic yards  |
| PlasticBottles | double    | Number of plastic bottles  |
| Polystyrene    | double    | Number of polystyrene items  |
| CigaretteButts | double    | Number of cigarette butts  |
| GlassBottles   | double    | Number of glass bottles  |
| PlasticBags    | double    | Number of plastic bags   |
| Wrappers       | double    | Number of wrappers   |
| SportsBalls    | double    | Number of sports balls   |
| HomesPowered   | double    | One ton of trash generates 500 kWh of electricity.<br>A household uses 30 kWh per day. |

# **Why we should choose this dataset for Project 1 ?**

- Real-world Impact
- Multifaceted Data
- Temporal Analysis
- Comparative Analysis
- Environmental Awareness
- Energy Conversion
- Learning Opportunity

# Our Approach

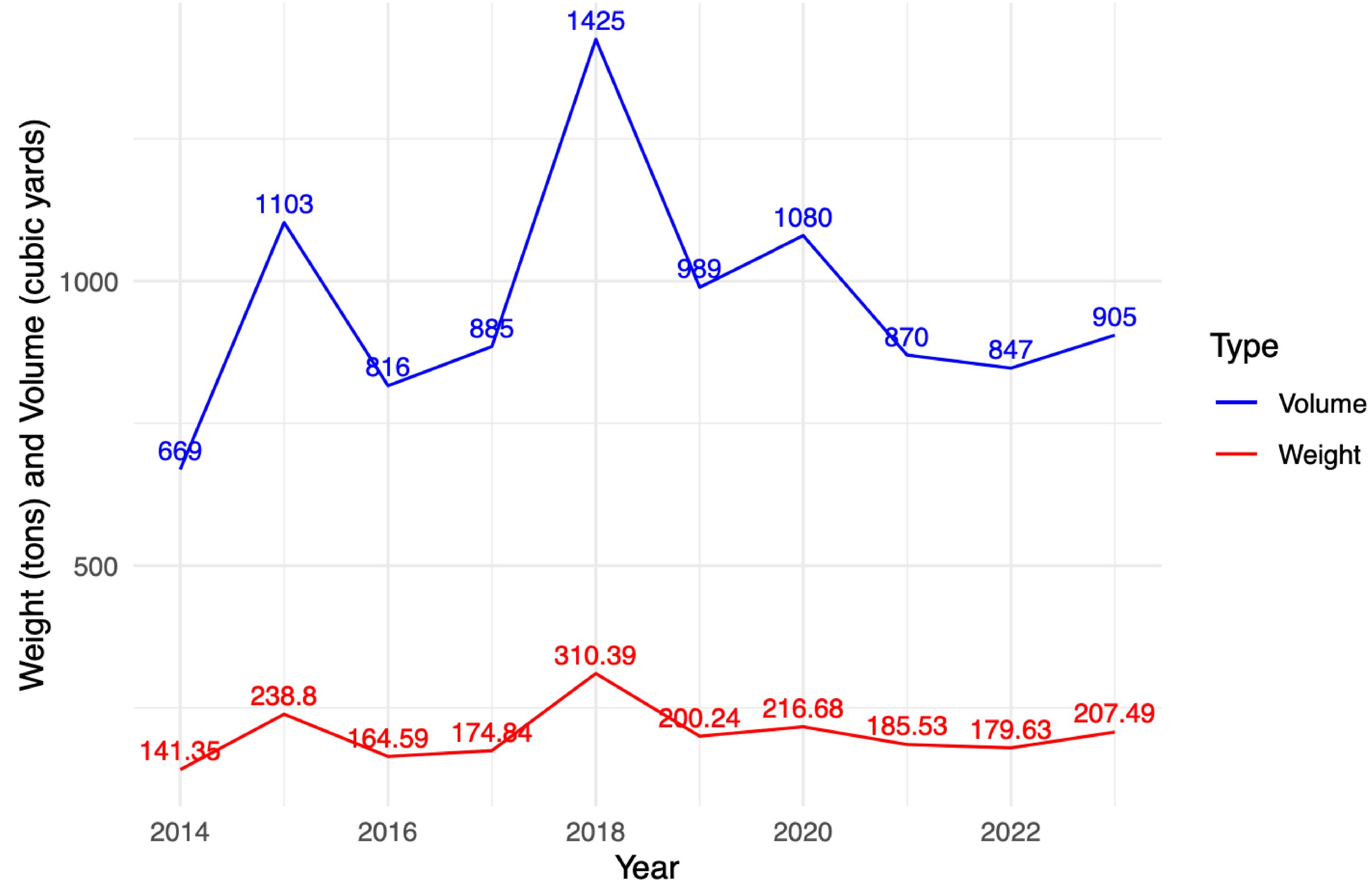
- Apply different plots to analyze waste composition and trends.
- Preprocess data to add columns relevant to our study.
- Use line and bar charts to show waste trends over time.
- Using charts:
  - Line chart: annual waste trends (weight, volume)
  - Stacked area: monthly waste composition
  - Color-mapped bars: waste type percentages
  - Line + bar (2018): detailed monthly analysis



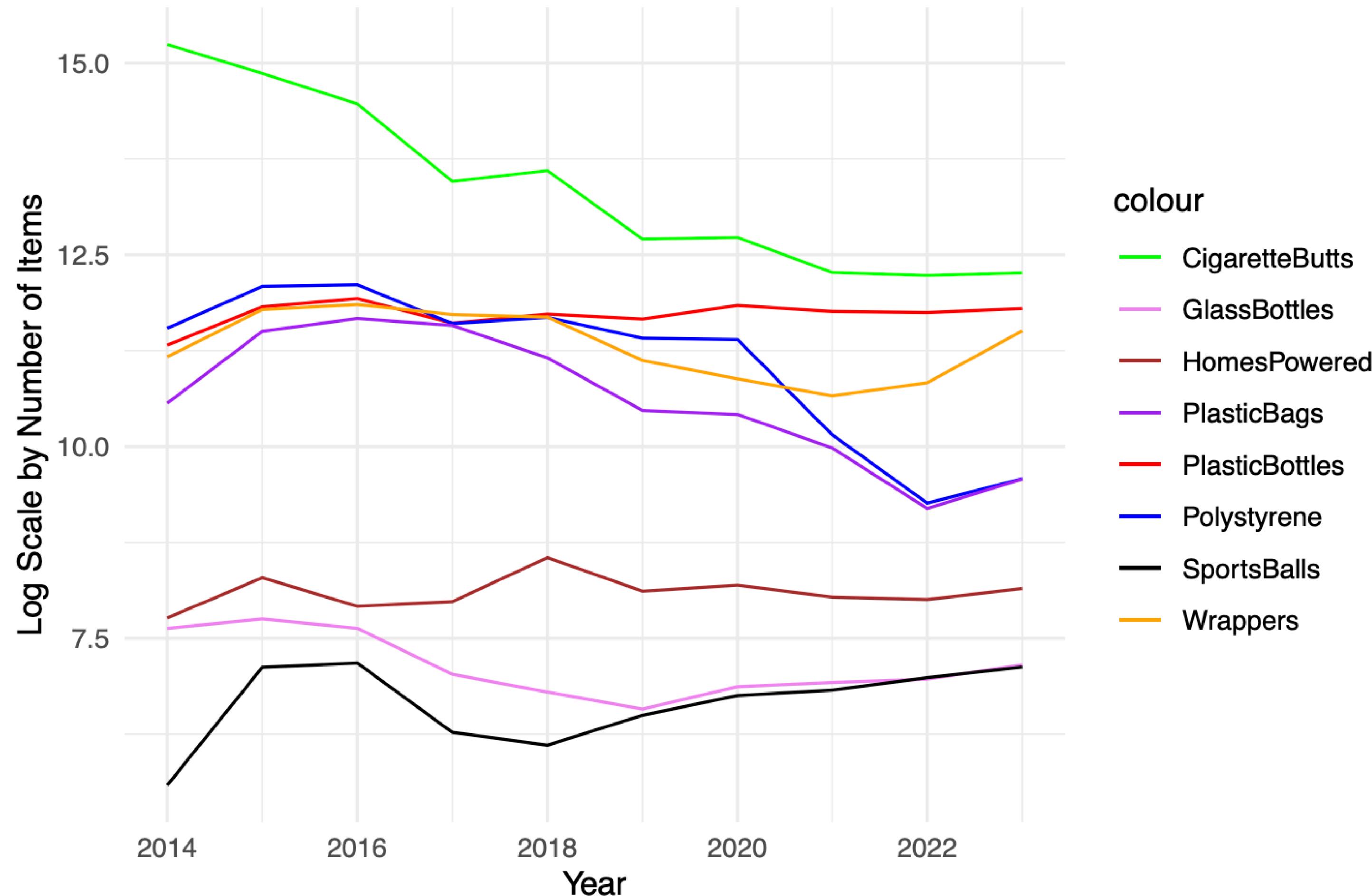
# **Question 1:**

## **How does the volume and weight of collected waste vary seasonally?**

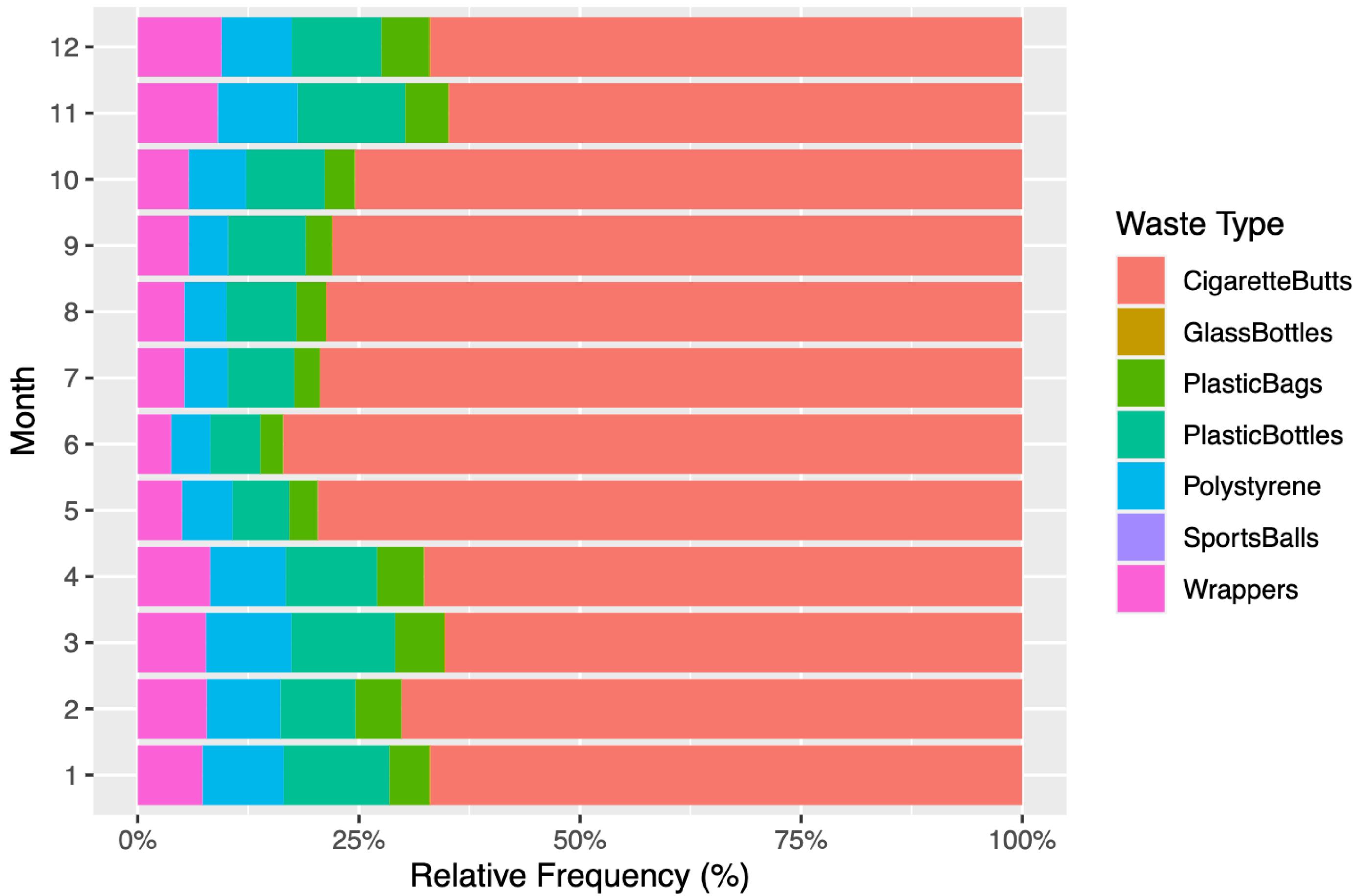
## Fig 1. Weight and Volume of collected waste by Year



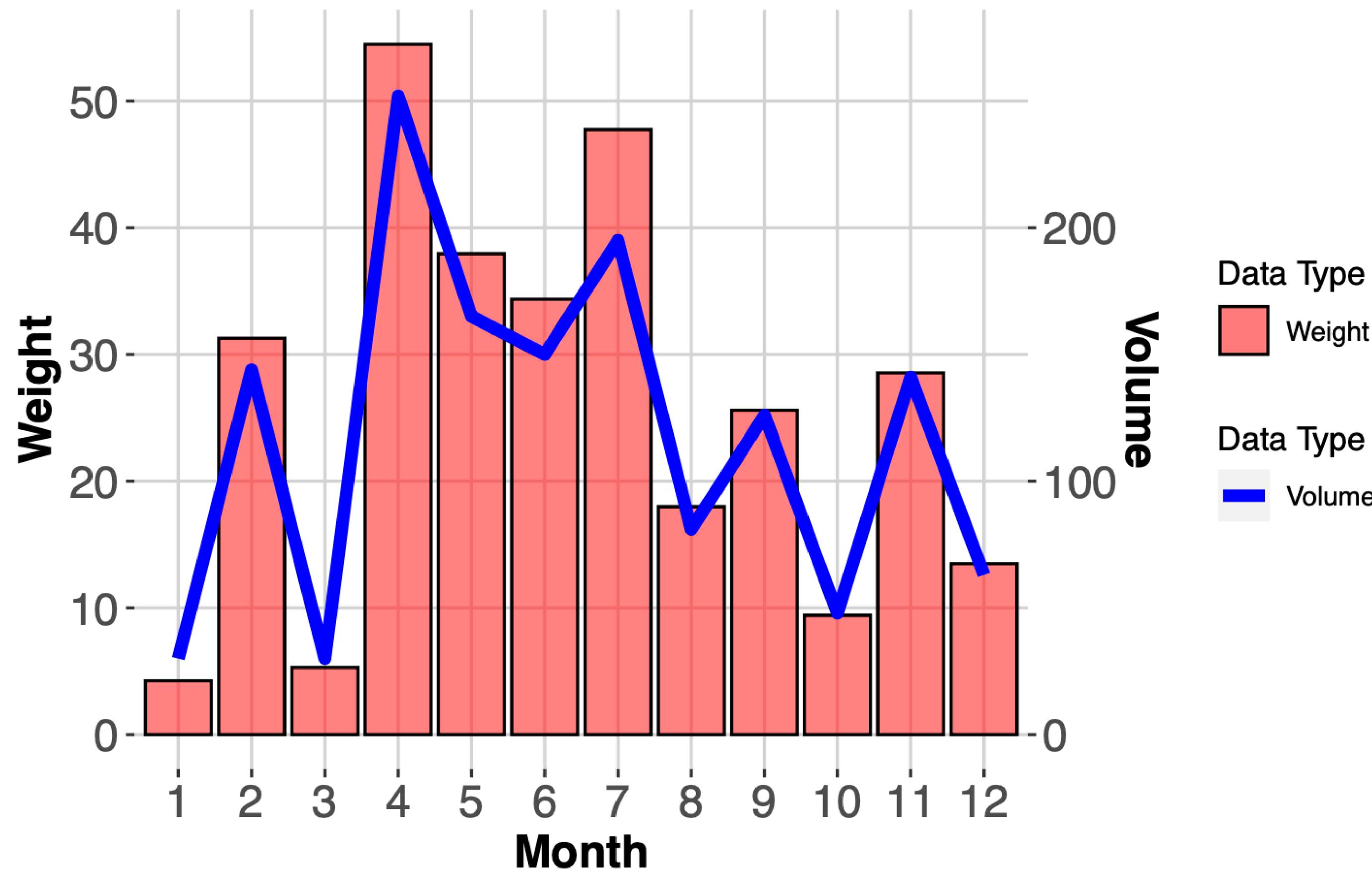
**Fig 2. The trend of type of the collected waste across different years**



**Fig 3. Relative Frequency Bar Chart of Waste Types by Month**



## Fig 4. Weight and Volume by Month in 2018

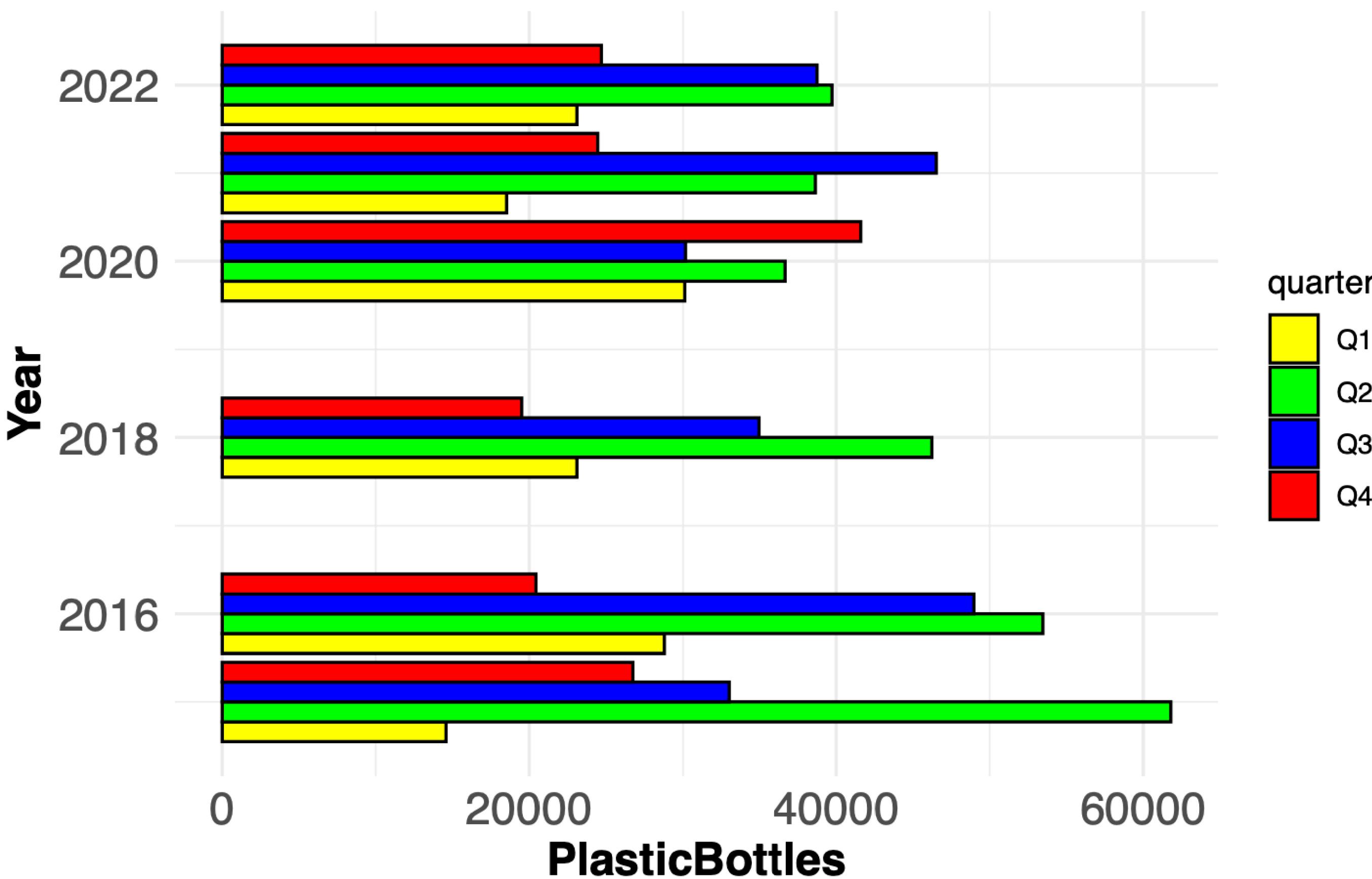


# Question 2:

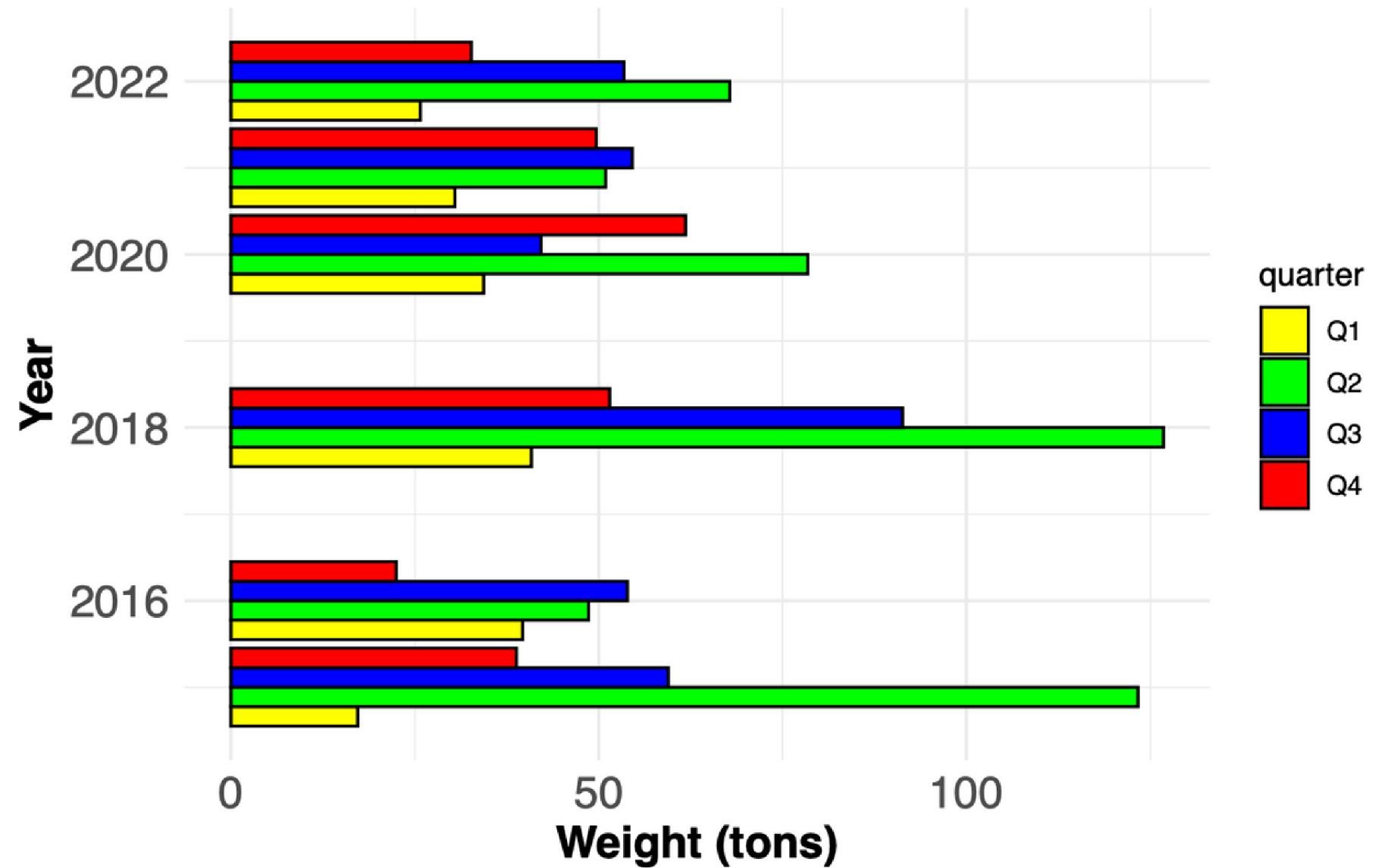
## How does the seasonal pattern of trash accumulation vary for different types of trash ?



# Fig 5. Plastic Bottles by Year and Quarter

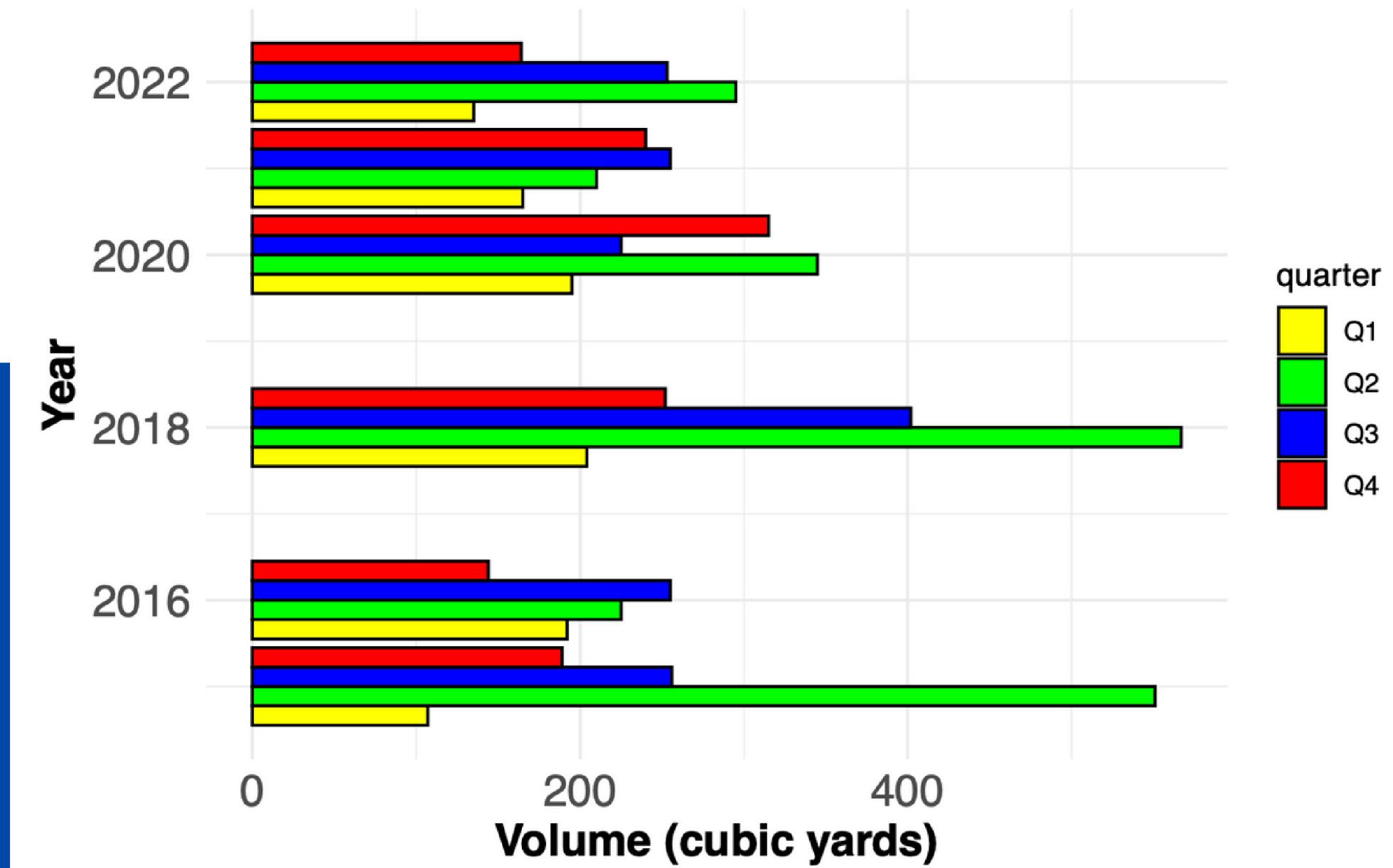


## Fig 6. Weight by Year and Quarter

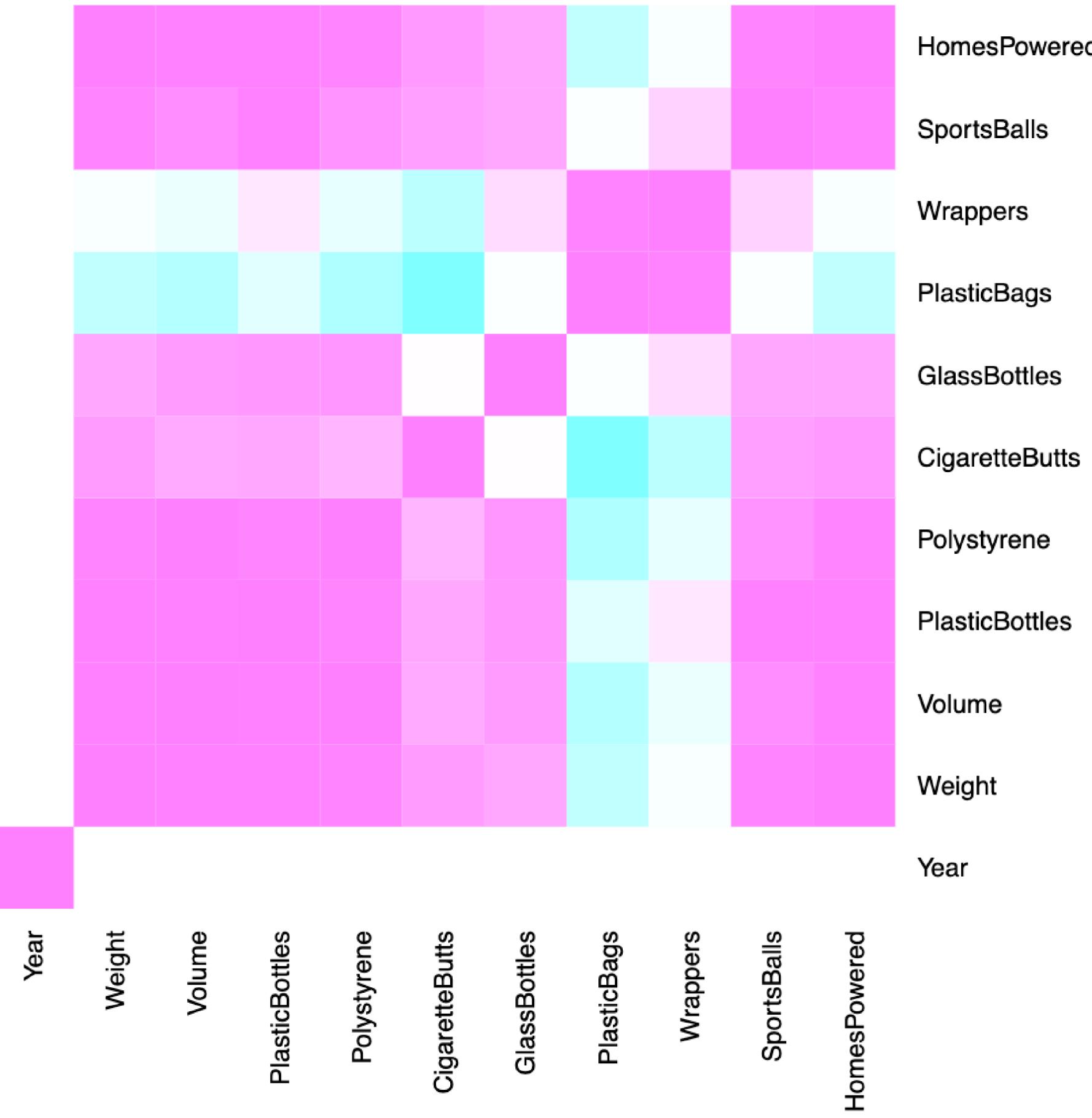


quarter  
Q1  
Q2  
Q3  
Q4

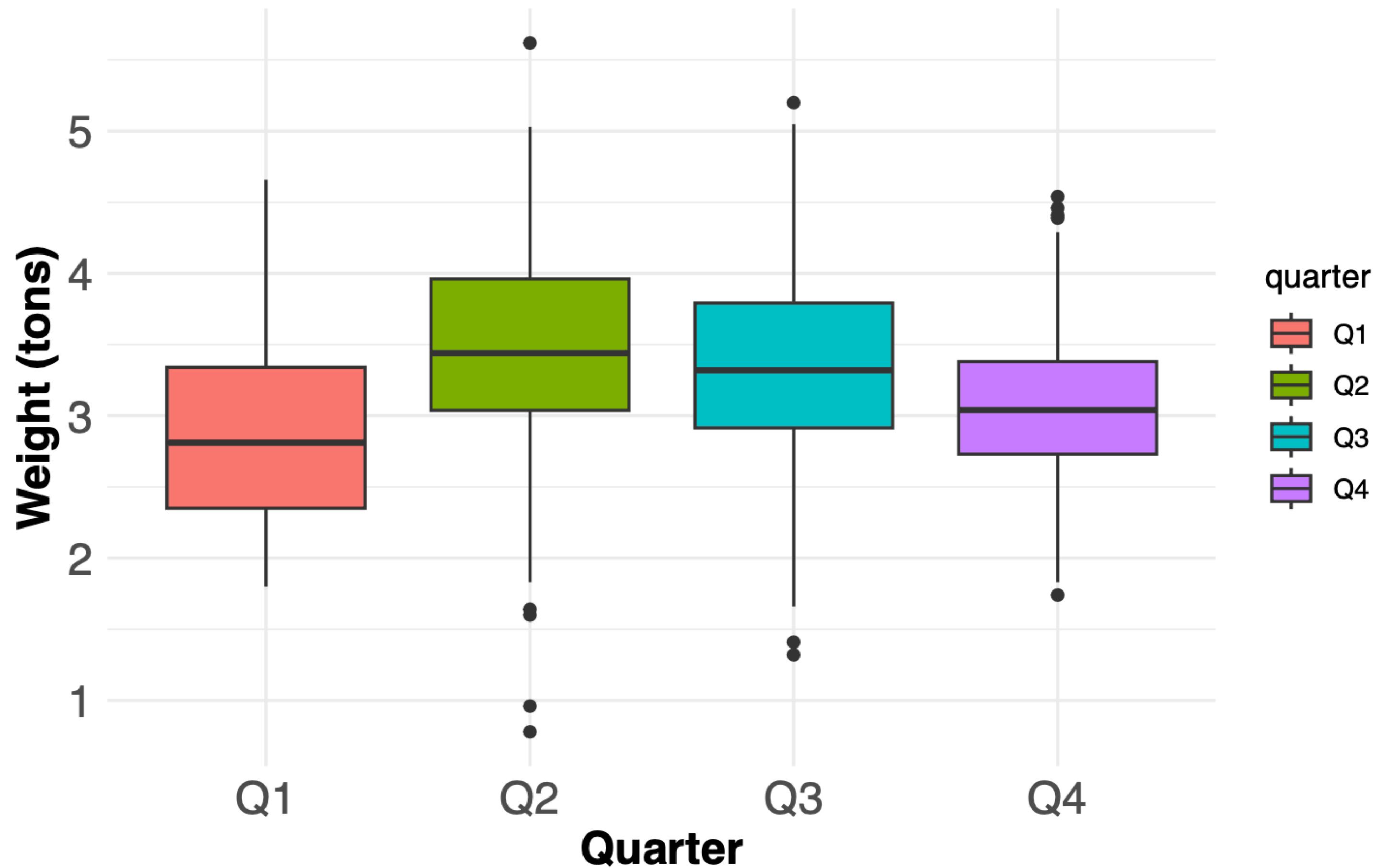
## Fig 7. Volume by Year and Quarter



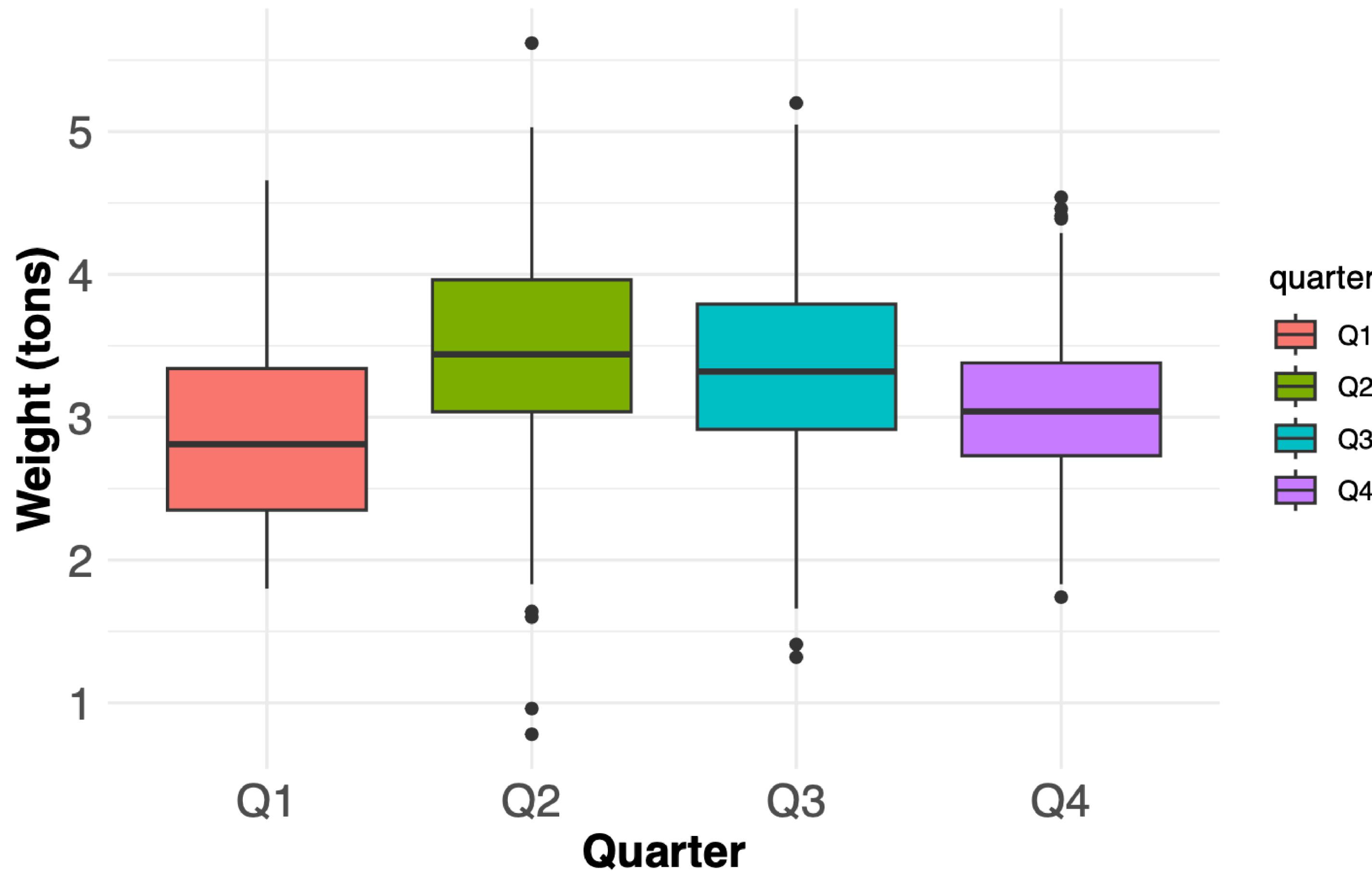
**Fig 8. Heatmap of Different Types of Trash by Year and Quarter (2015)**



# Fig 9. Distribution of Weight by Quarter



# Fig 9. Distribution of Weight by Quarter



# Conclusion

- **Trash Composition Insights:** Visualizations reveal variation in plastic bottles, polystyrene, glass over months/years.
- **Seasonal Fluctuations:** Seasonal trends in weight, volume, plastic bags documented.
- **Waste Dynamics:** Differences in trash accumulation among Trash Wheels observed.
- **Environmental Strategy:** Data informs waste management, optimizing collection, sustainability efforts.
- **Correlation Analysis:** Heatmaps show waste type correlations, guiding management strategies.

**THANK YOU**