

# DSA2101 Valentine's Day Group Project

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## 1. Introduction

This report presents an analysis of Valentine's Day consumer spending patterns in the United States from 2010 to 2022. The data was sourced from the TidyTuesday repository, originally compiled by Suraj Das from annual surveys conducted by the National Retail Federation.

The dataset is comprised of three components:

1. `historical_spending`: The average amount spent per person on seven gift categories (Candy, Flowers, Jewelry, Greeting Cards, Evening Out, Clothing, and Gift Cards) for each year.
2. `gifts_age`: The average percentage of consumers in different age groups (18-24, 25-34, 35-44, 45-54, 55-64, 65+) who spent on each gift category.
3. `gifts_gender`: The average percentage of consumers of each gender (Men, Women) who spent on each gift category.

The primary objective of this analysis is to explore the research question: *"How does Valentine's Day spending vary across different gift categories?"* We investigate how these spending patterns are influenced by age, gender, and broader economic trends over time.

## 2. Data Preparation

### 2.1 Data Cleaning and Transformation

The raw data was imported and processed using the `tidyverse` collection of R packages. To facilitate analysis and visualization, the datasets were transformed from a wide to a long format using the `pivot_longer()` function. This created a tidy data structure with dedicated columns for gift type (`Gifts`) and their corresponding values (`Percent` or `Amount`).

Columns not directly relevant to our visual analysis — `SpendingCelebrating`, `PercentCelebrating`, and `PerPerson` — were removed to simplify the datasets. All categorical variables were converted into factors to ensure they were treated as discrete groups in our analysis.

The following three tidy data frames were created for analysis:

- \* `gender_df`: For gender-based spending percentages.
- \* `hist_df`: For historical spending amounts per gift category.
- \* `age_df`: For age-based spending percentages.

### 2.2 Preliminary Data Summary

An initial exploratory analysis was conducted to identify the highest and lowest spending categories across genders, ages, and years.

Key observations from this summary included:

**Candy** was the most popular gift category across most age groups (18-24 to 55-64), while **Greeting Cards** were the most popular for consumers aged 65 and over.

**Greeting Cards** consistently represented the category with the lowest total amount spent (\$) each year, which is likely attributable to their low cost relative to other gifts.

These initial findings helped guide the development of our subsequent visualizations.

### 3. Analysis and Visualizations

#### 3.1 Spending Patterns by Age

**Visualization:** A grouped bar chart was used to visualize the average percentage of consumers in each age group who spent on each gift category.

**Findings and Interpretation:**

The visualization confirmed two major trends:

1. Candy is the most commonly purchased gift for all age groups except those 65 and over, who prefer greeting cards.
2. There is a general decline in the percentage of consumers purchasing gifts as age increases, with the notable exception of greeting cards.

This trend can be explained by shifting life priorities. Older consumers likely have more commitments and may place a higher value on sentimental, non-material expressions of affection, such as a handwritten card. Conversely, younger consumers may be more actively forming relationships, leading to higher participation in gift-giving across more categories.

#### 3.2 Spending Patterns by Gender

**Visualization:** A dumbbell chart was chosen to effectively highlight the differences in spending preferences between men and women for each gift category.

**Findings and Interpretation:**

The analysis revealed distinct gendered spending habits:

- A significantly higher percentage of **Men** purchase **Flowers** and **Jewelry**, aligning with traditional norms of expressing romance through grander, material gestures.
- A significantly higher percentage of **Women** purchase **Candy**, **Greeting Cards**, and **Gift Cards**, suggesting a preference for thoughtful and personal, yet often more practical, gifts.
- Spending on **Clothing** was nearly identical between genders, indicating it is a universally appealing category.

This highlights how societal expectations and norms continue to influence gift-giving behaviors on Valentine's Day.

### 3.3 Temporal Spending Trends (2010-2022)

**Visualization:** A small multiples line chart was employed to show the trend in average spending per person for each gift category over the 13-year period.

**Findings and Interpretation:**

Two primary insights were drawn from the time-series data:

1. **General Upward Trend:** From 2010 until 2020, spending increased across almost all categories, likely correlated with general economic growth and increased consumer purchasing power.
2. **The 2021 Anomaly:** The year 2021 saw a sharp decline in spending for all categories except Gift Cards. This is a direct consequence of the COVID-19 pandemic, which caused economic uncertainty and limited social activities due to lockdowns and social distancing measures. The rise in spending on Gift Cards underscores a shift towards practical, digitally deliverable gifts during a period of crisis.

## 4. Overall Conclusion

When synthesized, our analysis reveals that Valentine's Day spending is not monolithic but varies significantly based on demographic factors and external events.

- **Age** reflects a journey from broad participation in gift-giving to a more focused appreciation for sentimental value.
- **Gender** reveals deeply ingrained cultural scripts that shape how affection is expressed materially.
- **Time** demonstrates that spending habits are susceptible to macroeconomic forces and societal shocks, such as a global pandemic.

In conclusion, Valentine's Day spending varies across gift categories in a way that mirrors the complex interplay of *life stage*, *societal norms*, and *economic context*. It serves as a fascinating lens through which to observe evolving personal and societal values.