# GiftWise
## A gift Recommender System

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# Project Description

**Problem**
Gift Giving can often be a time consuming and stressful task.

Solution
 To create a gift recommender system to make gift finding easier and less stressful

Examples of the problem

1. Gifting during the holiday season - Overcrowded stores and too many options to choose from and buying gifts for multiple people.

2. Professional Gifting - Employers may want to get gifts for their hard working employees

3. Gifing between friends-  Finding a gift for a friend

4. Life Milestones - Finding gifts for birthdays, anniversaries, graduations, etc

## Data Collection

- Main data collection method used was web scraping using Selenium using a chrome webdriver.
- Selenium is open source tool  used to automating web drivers.
- Selenium can scrape dynamic websites that load their content using JavaScript

```python
import csv
import time
import random
from selenium import webdriver
from selenium.webdriver.chrome.service import Service
from selenium.webdriver.chrome.options import Options
from selenium.webdriver.common.by import By
from selenium.webdriver.support.ui import WebDriverWait
from selenium.webdriver.support import expected_conditions as EC
from selenium.common.exceptions import NoSuchElementException
```

# Data Collection

- Websites data collected from: Amazon, Target, Macy's

- Information collected from these websites:

  - Product name
  - Category
  - Price
  - Rating
  - Recommend Age
  - Product URL
  - Image URL

- Data for each retailer was saved in a dedicated csv file.

```
"/Users/Dajia/Desktop/Information Retrevial /Holiday Gift Project/.venv/bin/pyth
mazon.py"
(.venv) (base) Dajia@Dajias-MBP Holiday Gift Project % "/Users/Dajia/Desktop/Inf
a/Desktop/Information Retrevial /Holiday Gift Project/Amazon.py"
Scraping Laptops from Amazon
Loading page: https://www.amazon.com/s?k=laptops&page=1
Page loaded successfully.
Loading page: https://www.amazon.com/s?k=laptops&page=2
Page loaded successfully.
Loading page: https://www.amazon.com/s?k=laptops&page=3
Page loaded successfully.
Loading page: https://www.amazon.com/s?k=laptops&page=4
Page loaded successfully.
Loading page: https://www.amazon.com/s?k=laptops&page=5
Page loaded successfully.
Scraping Headphones from Amazon
Loading page: https://www.amazon.com/s?k=headphones&page=1
Page loaded successfully.
Loading page: https://www.amazon.com/s?k=headphones&page=2
Page loaded successfully.
Loading page: https://www.amazon.com/s?k=headphones&page=3
Page loaded successfully.
Loading page: https://www.amazon.com/s?k=headphones&page=4
Page loaded successfully.
Loading page: https://www.amazon.com/s?k=headphones&page=5
Page loaded successfully.
Scraping Phones from Amazon
Loading page: https://www.amazon.com/s?k=phones&page=1
Page loaded successfully.
Loading page: https://www.amazon.com/s?k=phones&page=2
Page loaded successfully.
Loading page: https://www.amazon.com/s?k=phones&page=3
Page loaded successfully.
Loading page: https://www.amazon.com/s?k=phones&page=4
Page loaded successfully.
Loading page: https://www.amazon.com/s?k=phones&page=5
Page loaded successfully.
Scraping Cameras from Amazon
Loading page: https://www.amazon.com/s?k=cameras&page=1
Page loaded successfully.
Loading page: https://www.amazon.com/s?k=cameras&page=2
Page loaded successfully.
Loading page: https://www.amazon.com/s?k=cameras&page=3
Page loaded successfully.
Loading page: https://www.amazon.com/s?k=cameras&page=4
Page loaded successfully.
Loading page: https://www.amazon.com/s?k=cameras&page=5
```

```
"/Users/Dajia/Desktop/Information Retrevial /Holiday Gift Project/.venv/bin/pytho
arget.py"
(.venv) (base) Dajia@Dajias-MBP Holiday Gift Project % "/Users/Dajia/Desktop/Infor
a/Desktop/Information Retrevial /Holiday Gift Project/Target.py"
Scraping Laptops from Target
Loading page: https://www.target.com/s?searchTerm=laptops&page=1
Page loaded successfully.
Loading page: https://www.target.com/s?searchTerm=laptops&page=2
Page loaded successfully.
Loading page: https://www.target.com/s?searchTerm=laptops&page=3
Page loaded successfully.
Loading page: https://www.target.com/s?searchTerm=laptops&page=4
Page loaded successfully.
Loading page: https://www.target.com/s?searchTerm=laptops&page=5
Page loaded successfully.
Scraping Headphones from Target
Loading page: https://www.target.com/s?searchTerm=headphones&page=1
Page loaded successfully.
Loading page: https://www.target.com/s?searchTerm=headphones&page=2
Page loaded successfully.
Loading page: https://www.target.com/s?searchTerm=headphones&page=3
Page loaded successfully.
Loading page: https://www.target.com/s?searchTerm=headphones&page=4
Page loaded successfully.
Loading page: https://www.target.com/s?searchTerm=headphones&page=5
Page loaded successfully.
Scraping Cameras from Target
Loading page: https://www.target.com/s?searchTerm=cameras&page=1
Page loaded successfully.
Error occurred while scraping https://www.target.com/s?searchTerm=cameras&page=1:
```
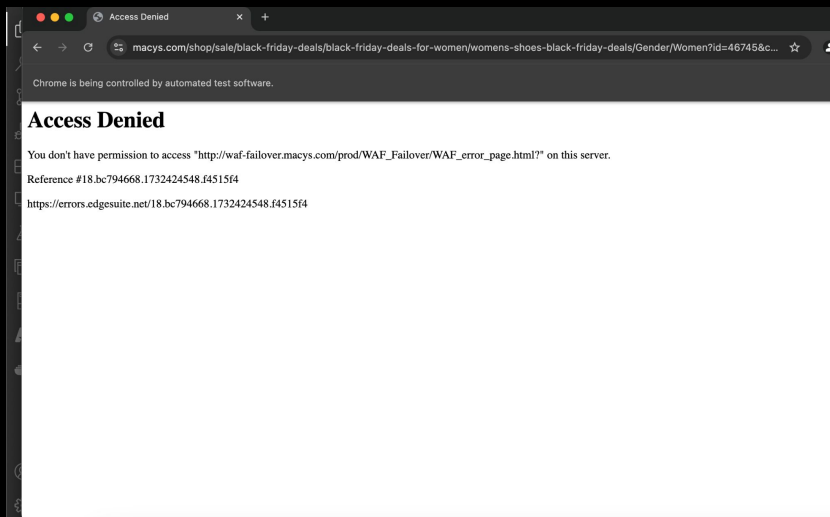
```
"/Users/Dajia/Desktop/Information Retrevial /Holiday Gift Project/.venv/bin/python" "/Users/Dajia/Desktop/Information Retrevial /Holiday Gift Project/
acy's.py"
(.venv) (base) Dajia@Dajias-MBP Holiday Gift Project % "/Users/Dajia/Desktop/Information Retrevial /Holiday Gift Project/.venv/bin/python" "/Users/Daji
a/Desktop/Information Retrevial /Holiday Gift Project/Macy's.py"
Scraping Women Shoes from Amazon
Loading page: https://www.macys.com/shop/womens-clothing/all-womens-shoes?id=56233&page=1
Loading page: https://www.macys.com/shop/womens-clothing/all-womens-shoes?id=56233&page=2
Loading page: https://www.macys.com/shop/womens-clothing/all-womens-shoes?id=56233&page=3
Loading page: https://www.macys.com/shop/womens-clothing/all-womens-shoes?id=56233&page=4
Loading page: https://www.macys.com/shop/womens-clothing/all-womens-shoes?id=56233&page=5
Scraping Men Shoes from Amazon
Loading page: https://www.macys.com/shop/mens-clothing/shop-all-mens-shoes?id=55822&page=1
Loading page: https://www.macys.com/shop/mens-clothing/shop-all-mens-shoes?id=55822&page=2
Loading page: https://www.macys.com/shop/mens-clothing/shop-all-mens-shoes?id=55822&page=3
Loading page: https://www.macys.com/shop/mens-clothing/shop-all-mens-shoes?id=55822&page=4
Loading page: https://www.macys.com/shop/mens-clothing/shop-all-mens-shoes?id=55822&page=5
Scraping Girl Shoes from Amazon
Loading page: https://www.macys.com/shop/kids-clothes/kids-shoes/girls-shoes?id=209698&page=1
Loading page: https://www.macys.com/shop/kids-clothes/kids-shoes/girls-shoes?id=209698&page=2
Loading page: https://www.macys.com/shop/kids-clothes/kids-shoes/girls-shoes?id=209698&page=3
Loading page: https://www.macys.com/shop/kids-clothes/kids-shoes/girls-shoes?id=209698&page=4
Loading page: https://www.macys.com/shop/kids-clothes/kids-shoes/girls-shoes?id=209698&page=5
Scraping Boys Shoes from Amazon
Loading page: https://www.macys.com/shop/kids-clothes/kids-shoes/boys-shoes?id=209702&page=1
Loading page: https://www.macys.com/shop/kids-clothes/kids-shoes/boys-shoes?id=209702&page=2
Loading page: https://www.macys.com/shop/kids-clothes/kids-shoes/boys-shoes?id=209702&page=3
Loading page: https://www.macys.com/shop/kids-clothes/kids-shoes/boys-shoes?id=209702&page=4
Loading page: https://www.macys.com/shop/kids-clothes/kids-shoes/boys-shoes?id=209702&page=5
```

# Issues with Data Collection

## Access Blocked

- How we fixed : Adding additional chrome options that bypass anti-bot measures.



```python
from selenium.common.exceptions import NoSuchElementException

# Setup Chrome options
chrome_options = Options()
chrome_options.add_argument("--disable-blink-features=AutomationControlled")
chrome_options.add_argument("--start-maximized")
chrome_options.add_argument("--disable-gpu")
chrome_options.add_argument("user-agent=Mozilla/5.0")
```

# All data was not found

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Product ID | Name | Category | Price | Rating | Recommended Age | Retailer | Product URL |
| 2 | A-001 | Name not av | Laptops | Price not ava | Rating not av | Age info not found | Amazon | URL not available |
| 3 | A-002 | Check each | Laptops | Price not ava | Rating not av | Age info not found | Amazon | |
| 4 | A-003 | Apple 2022 | Laptops | $888.00 | 4.7 out of 5 | Age info not found | Amazon | https://www.amazon.com/sspa/click?ie=UTF8&spc=MTo4Mjc2MTgxNTY2NjMyMTczOjE3Mzl1Nzc1NzM6c3BfYXRmOjMwMDU1Mjc0MjQwMjo6MDo6&url=%2FApple-2022-MacBook-Laptop-chip%2Fdp%2FB0DM7123FN%2Fref%3Dsr_1_1_sspa%3Fdib%3DeyJ2IjoiMSJ9.nyQJenjtxRud |
| 5 | A-004 | Apple 2024 | Laptops | $1,413.00 | 4.7 out of 5 | Age info not found | Amazon | https://www.amazon.com/sspa/click?ie=UTF8&spc=MTo4Mjc2MTgxNTY2NjMyMTczOjE3Mzl1Nzc1NzM6c3BfYXRmOjMwMDE3NjU2OTA4NTkwMjo6MDo6&url=%2FApple-2024-MacBook-15-inch-Laptop%2Fdp%2FB0CX3QZP5P%2Fref%3Dsr_1_2_sspa%3Fdib%3DeyJ2IjoiMSJ9.nyQJenjtx |
| 6 | A-005 | ASUS 15.6,A | Laptops | $159.99 | 4.1 out of 5 | Age info not found | Amazon | https://www.amazon.com/ASUS-Vivobook-Celeron-Windows-L510A-ES04/dp/B0CRDCW3Q3/ref=sr_1_3?dib=eyJ2IjoiMSJ9.nyQJenjtxRudobIEUM_drziW-V7IARtpq8RzmPhHUhpkwrl87ToA3cWkegBkMja-bfjikp9hdN-BXYddub0AQIBw8muZPedHJM_2pfurq1ISVkNlpZd7nTmn1s6hQ1U |
| 7 | A-006 | Acer Aspire 3 | Laptops | $279.99 | 4.4 out of 5 | Age info not found | Amazon | https://www.amazon.com/A315-24P-R7VH-Display-Quad-Core-Processor-Graphics/dp/B0BS4BP8FB/ref=sr_1_4?dib=eyJ2IjoiMSJ9.nyQJenjtxRudobIEUM_drziW-V7IARtpq8RzmPhHUhpkwrl87ToA3cWkegBkMja-bfjikp9hdN-BXYddub0AQIBw8muZPedHJM_2pfurq1ISVkNlpZd7nTmn1s |
| 8 | A-007 | ASUS Vivob | Laptops | $275.93 | 4.1 out of 5 | Age info not found | Amazon | https://www.amazon.com/ASUS-Vivobook-Laptop-Windows-E1504FA-AS33/dp/B0CWHYW27D/ref=sr_1_5?dib=eyJ2IjoiMSJ9.nyQJenjtxRudobIEUM_drziW-V7IARtpq8RzmPhHUhpkwrl87ToA3cWkegBkMja-bfjikp9hdN-BXYddub0AQIBw8muZPedHJM_2pfurq1ISVkNlpZd7nTmn1s6hQ1U |
| 9 | A-008 | Apple 2022 | Laptops | $888.00 | 4.7 out of 5 | Age info not found | Amazon | https://www.amazon.com/sspa/click?ie=UTF8&spc=MTo0MjYxODAxODA0ODE2MTYyOjE3Mzl1Nzc1NzM6c3Bfc2VhcmNoX3RoZW1hdGljOjMwMDU1Mjc0MjUwMjo6MDo6&url=%2FApple-2022-MacBook-Laptop-chip%2Fdp%2FB0DM73SM4K%2Fref%3Dsxin_13_pa_sp_search_them |
| 10 | A-009 | Apple 2022 | Laptops | $888.00 | 4.7 out of 5 | Age info not found | Amazon | https://www.amazon.com/sspa/click?ie=UTF8&spc=MTo0MjYxODAxODA0ODE2MTYyOjE3Mzl1Nzc1NzM6c3Bfc2VhcmNoX3RoZW1hdGljOjMwMDU1Mjc0MjUwMjo6MDo6&url=%2FApple-2022-MacBook-Laptop-chip%2Fdp%2FB0DM73SM4K%2Fref%3Dsxin_13_pa_sp_search_them |
| 11 | A-010 | Apple 2024 | Laptops | $1,178.00 | 4.7 out of 5 | Age info not found | Amazon | https://www.amazon.com/sspa/click?ie=UTF8&spc=MTo0MjYxODAxODA0ODE2MTYyOjE3Mzl1Nzc1NzM6c3Bfc2VhcmNoX3RoZW1hdGljOjMwMDE3NjU2OTA4NjgwMjo6MDo6&url=%2FApple-2024-MacBook-15-inch-Laptop%2Fdp%2FB0CX3PL3GL%2Fref%3Dsxin_13_pa_sp_search_th |
| 12 | A-011 | Dell Inspiron | Laptops | $649.99 | 4.1 out of 5 | Age info not found | Amazon | https://www.amazon.com/sspa/click?ie=UTF8&spc=MTo0MjYxODAxODA0ODE2MTYyOjE3Mzl1Nzc1NzM6c3Bfc2VhcmNoX3RoZW1hdGljOjMwMDE4NTlyOTE5NzQwMjo6MDo6&url=%2FDell-Inspiron-3530-Laptop-Touchscreen%2Fdp%2FB0CRZFMPSV%2Fref%3Dsxin_13_pa_sp_search_ |
| 13 | A-012 | | Laptops | $. | Rating not av | Age info not found | Amazon | https://www.amazon.com/sspa/click?ie=UTF8&spc=MTo0MjYxODAxODA0ODE2MTYyOjE3Mzl1Nzc1NzM6c3Bfc2VhcmNoX3RoZW1hdGljOjMwMDU2MTg4NjE5NDMwMjo6MDo6&url=%2FLenovo-Legion-Pro-7i-Gen%2Fdp%2FB0DN6WBL59%2Fref%3Dsxin_13_pa_sp_search_thematic_ss |
| 14 | A-013 | | Laptops | | 4.3 out of 5 | Age info not found | Amazon | https://www.amazon.com/sspa/click?ie=UTF8&spc=MTo0MjYxODAxODA0ODE2MTYyOjE3Mzl1Nzc1NzM6c3Bfc2VhcmNoX3RoZW1hdGljOjMwMDU2MTg4NjU5NjYwMjE2MTEwMjo6MDo6&url=%2FLenovo-V15-Hexa-core-Processor-i7-1065G7%2Fdp%2FB0CK9FQXWR%2Fref%3Dsxin_13_pa_s |
| 15 | A-014 | Name not av | Laptops | Price not ava | Rating not av | Age info not found | Amazon | URL not available |
| 16 | A-015 | Name not av | Laptops | Price not ava | Rating not av | Age info not found | Amazon | URL not available |

| | | Name | | | | Price | Rating | Retailer | Product URL |
|---|---|---|---|---|---|---|---|---|---|
| 3411 | M-125 | Name not available | | | | | Women Shoes | 4.3276 out of 5 stars | Macy's | https://www.macys.com/shop/product/ugg |
| 3412 | M-126 | Name not available | | | | | Women Shoes | 4.7612 out of 5 stars | Macy's | https://www.macys.com/shop/product/char |
| 3413 | M-127 | Name not available | | | | | Women Shoes | 4.2609 out of 5 stars | Macy's | https://www.macys.com/shop/product/gues |
| 3414 | M-128 | Name not available | | | | | Women Shoes | 4.0732 out of 5 stars | Macy's | https://www.macys.com/shop/product/calv |
| 3415 | M-129 | Name not available | | | | | Women Shoes | 3.95 out of 5 stars | Macy's | https://www.macys.com/shop/product/koo |
| 3416 | M-130 | Name not available | | | | | Women Shoes | 4.1552 out of 5 stars | Macy's | https://www.macys.com/shop/product/i.n.c |
| 3417 | M-131 | Women's Tinsley Square Toe Mary Jane Flats | | | | $80.50 | Women Shoes | Rating not available | Macy's | https://www.macys.com/shop/product/fran |
| 3418 | M-132 | Women's Classic II Short Boots | | | | $180.00 | Women Shoes | Rating not available | Macy's | https://www.macys.com/shop/product/ugg |
| 3419 | M-133 | Women's Vivian Western Block Heel Booties | | | | $76.50 | Women Shoes | Rating not available | Macy's | https://www.macys.com/shop/product/fran |
| 3420 | M-134 | Women's Mabon Nylon High Top Sneakers | | | | $59.50 | Women Shoes | Rating not available | Macy's | https://www.macys.com/shop/product/calv |
| 3421 | M-135 | Women"s Rebecca Buckle Kitten-Heel Leather Booties | | | | Now $165.0 | Women Shoes | Rating not available | Macy's | https://www.macys.com/shop/product/coa |
| 3422 | M-136 | Women's Basel Ankle Booties | | | | $59.40 - | Women Shoes | Rating not available | Macy's | https://www.macys.com/shop/product/luck |
| 3423 | M-137 | Women's Bowman Square Toe Knee High Dress Boots | | | | $90.00 | Women Shoes | Rating not available | Macy's | https://www.macys.com/shop/product/fran |
| 3424 | M-138 | Debut Knee-High Kitten-Heel Dress Boots | | | | $53.40 | Women Shoes | 4.25 out of 5 stars | Macy's | https://www.macys.com/shop/product/mad |
| 3425 | M-139 | Women's Denla Cold Weather Faux Fur Cozy Booties | | | | $49.99 | Women Shoes | Rating not available | Macy's | https://www.macys.com/shop/product/gues |
| 3426 | M-140 | Women's Classic II Mini Boots | | | | $160.00 | Women Shoes | Rating not available | Macy's | https://www.macys.com/shop/product/ugg |
| 3427 | M-141 | Women's Collection Kepley Erin Boots | | | | $84.00 | Women Shoes | Rating not available | Macy's | https://www.macys.com/shop/product/clark |

# Creating more Valid Records



```
Total records: 8261
Skipped records: 8261
Valid records: 0
```

- Filled in some of the missing data such as data such as recommended age more products valid

# Experiment 1: Data Preprocessing

Age- Found certain words in the product name and assigned an age.

Defined ages for categories

```javascript
// Update Recommended Age
const updateRecommendedAge = (record) => {
  const name = record["Name"] ? record["Name"].toLowerCase() : "";
  const category = record["Category"] ? record["Category"].toLowerCase() : "";
  let recommendedAge = record["Recommended Age"] || "";

  if (!recommendedAge || recommendedAge.trim().toLowerCase() === "age info not found") {
    if (/\b(adult|adults|women|men|'s)\b/i.test(name)) {
      recommendedAge = "18+";
    } else if (/\b(kid|kids|girl|girls|boy|boys|'s)\b/i.test(name)) {
      recommendedAge = "5+";
    } else if (/\btoddler(s|'s)?\b/i.test(name)) {
      recommendedAge = "1+";
    } else if (/\b(handbags|jewelry|accessories|fragrance)\b/i.test(category)) {
      recommendedAge = "15+";
    } else if (/\b(laptops|phones|cameras|game consoles|headphones|tablets)\b/i.test(category)) {
      recommendedAge = "10+";
    } else {
      recommendedAge = "Age info not found";
    }
  }

  record["Recommended Age"] = recommendedAge;
  return record;
};
```

| 4 | A-003 | Apple 2022 M | Laptops | | $888.00 | 4.7 out of 5 st | Age info not found | Amazon | https://www. | https://m.media-amazon.com/images/I/61AYp3KqwjL._AC_UY21 |

```
1   [
2     {
3       "Product ID": "A-003",
4       "Name": "Apple 2022 MacBook Air Laptop with M2 chip: Built for Apple Intelligence, 13.6-inch Liquid Retina D
5       "Category": "Laptops",
6       "Price": "$888.00",
7       "Rating": "4.7 out of 5 stars, rating details",
8       "Recommended Age": "10+",
9       "Retailer": "Amazon",
0       "Product URL": "https://www.amazon.com/sspa/click?ie=UTF8&spc=MTo4Mjc2MTgxNTY2NjMyMTcz0jE3MzI1Nzc1NzM6c3BfYX
1       "Image URL": "https://m.media-amazon.com/images/I/61AYp3KqwjL._AC_UY218_.jpg"
2     },
```

# Results

- After updating recommend age,
  there was increase in valid records.

```
mens te beau te parfum spray 1.2 oz. created for Macy's ID-1733175 / image URL : image URL not available /
Total records: 8261
Invalid records: 5609
Valid records: 2652
Valid records per retailer:
Amazon: 1723
Target: 198
Macy's: 731
Valid records saved to: /Users/Dajia/Desktop/Information Retrevial /Holiday Gift Project/valid_records2.json
All valid records have been processed and saved.
```

- We tried to use OpenAI to use the product link to find additional missing data such as ratings to make more products valid but we were unsuccessful

```
Error assigning interests with OpenAI: openai.createChatCompletion is not a function
Error assigning interests with OpenAI: openai.createChatCompletion is not a function
Error assigning interests with OpenAI: openai.createChatCompletion is not a function
Error assigning interests with OpenAI: openai.createChatCompletion is not a function
Error assigning interests with OpenAI: openai.createChatCompletion is not a function
Error assigning interests with OpenAI: openai.createChatCompletion is not a function
Error assigning interests with OpenAI: openai.createChatCompletion is not a function
Error assigning interests with OpenAI: openai.createChatCompletion is not a function
Error reassigning fields with OpenAI: openai.createChatCompletion is not a function
Error reassigning fields with OpenAI: openai.createChatCompletion is not a function
Error reassigning fields with OpenAI: openai.createChatCompletion is not a function
Error reassigning fields with OpenAI: openai.createChatCompletion is not a function
Error reassigning fields with OpenAI: openai.createChatCompletion is not a function
Error reassigning fields with OpenAI: openai.createChatCompletion is not a function
```

- In the end, we only ended with 2652 valid products.

# Text Processing

- Using the valid records from the preprocessing we applied the following the names of the products:
1. Removed any stop words
2. Lemmatization
3. Tokenization
4. Found the TF-IDF
5. Calculated Cosine Similarity
6. Generated 5 similar products

```
{
  "Product ID": "A-003",
  "Main Product": "Apple 2022 MacBook Air Laptop with M2 chip: Built for Apple Intelligence, 13.6-inch Liquid Retina Display,
  "Similar Products": [
    {
      "Product ID": "A-008",
      "Name": "Apple 2022 MacBook Air Laptop with M2 chip: Built for Apple Intelligence, 13.6-inch Liquid Retina Display, 16GB
      "Similarity Score": 0.93
    },
    {
      "Product ID": "A-009",
      "Name": "Apple 2022 MacBook Air Laptop with M2 chip: Built for Apple Intelligence, 13.6-inch Liquid Retina Display, 16GB
      "Similarity Score": 0.93
    },
    {
      "Product ID": "A-111",
      "Name": "Apple 2022 MacBook Air Laptop with M2 chip: Built for Apple Intelligence, 13.6-inch Liquid Retina Display, 16GB
      "Similarity Score": 0.9
    },
    {
      "Product ID": "A-062",
      "Name": "Apple 2022 MacBook Air Laptop with M2 chip: Built for Apple Intelligence, 13.6-inch Liquid Retina Display, 16GB
      "Similarity Score": 0.79
    },
    {
      "Product ID": "A-017",
      "Name": "Apple 2024 MacBook Air 13-inch Laptop with M3 chip: Built for Apple Intelligence, 13.6-inch Liquid Retina Displ
      "Similarity Score": 0.66
    }
```

# Backend Logic

- Given two resulting files valid_records.json and product_similarity.json from the text preprocessing and data mining process, turn query results from filters

- Initial narrowing from "rigid rules" of filters and some additional normalization:

```javascript
4    import validRecordsData from './valid_records.json';
5    import productSimilarityData from './product_similarity.json';
6
7    function readRecords() {
8      // helper function: normalize price string to a number
9      const normalizePrice = (priceString) => parseFloat(priceString.replace('$', ''));
10
11     // helper function: extract rating as a number
12     const extractRating = (ratingString) => parseFloat(ratingString.split(' ')[0]);
13
14     // helper function: filter by age
15     const filterByAge = (record, ageFilter) => {
16       const ageString = record["Recommended Age"] || "";
17       if (!ageFilter) return true; // if no age filter, include all
18       if (ageFilter === "Child") {
19         return ageString.includes("years") && !ageString.includes("months");
20       }
21       if (ageFilter === "Teen" || ageFilter === "Adult") {
22         return ageString.includes("+");
23       }
24       return true; // default to include all if no specific match
25     };
```

# Backend Logic

- category filtering:

```
27  // Helper function: Filter by category
28  const filterByCategory = (record, categoryFilter) => {
29    if (!categoryFilter) return true; // if no category filter, include all
30    const category = record["Category"] || "";
31    const categoryMappings = {
32      //? manual assignments of known unique categoires in valid_records.json to closest given sorting category
33      Sports: ["Bikes", "Boy Shoes", "Baby Shoes", "Men Coats & Jackets", "Boy Coats & Jackets",
34        "Girl Coats & Jackets", "Women Coats & Jackets", "Men Shoes", "Girl Shoes", "Women Shoes"],
35      Books: ["Toys", "Dolls"],
36      Tech: ["Headphones", "Tablets", "Laptops", "Jewelry", "Cameras", "Handbags", "Phones",
37        "Fragrance", "Accessories", "Game Consoles"]
38
39    };
40    return categoryMappings[categoryFilter]?.includes(category) ?? true;
41  };
```

- and hardcoded testing filters:

```
44    const filters = {
45      age: null, // example: no age filter applies
46      category: null, // example: no category filter applied
47      price: 200, // example: maximum price based on slider
48      //? above filters should show all items which are less than $200 regarldess of other defining features
49    };
```

# Backend Logic

- The calls to filter the original list, and the initial discovery of top 10 rated items (small scope chosen for testing given scope of the project) that follow the rigid filtering rules

```
51    // step 1: filter valid records
52    let filteredRecords = validRecordsData.filter(
53      (record) =>
54        filterByAge(record, filters.age) &&
55        normalizePrice(record["Price"]) <= filters.price &&
56        filterByCategory(record, filters.category)
57    );
58
59    // step 2: sort by rating and pick the top 10
60    filteredRecords = filteredRecords
61      .sort((a, b) => extractRating(b["Rating"]) - extractRating(a["Rating"]))
62      .slice(0, 10);
```

# Backend Logic

- Secondary discovery of additional 0-40 items (small scope chosen for testing) by checking if the initial 10 items have at least one other item which is very similar (>0.84) to them. Append these to a list of product IDs

```
64    // step 3: use product similarity to expand the list
65    const productIds = new Set(filteredRecords.map((record) => record["Product ID"]));
66    productSimilarityData.forEach((entry) => {
67      if (productIds.has(entry["Product ID"])) {
68        entry["Similar Products"].forEach((similar) => {
69          if (similar["Similarity Score"] > 0.84) {
70            productIds.add(similar["Product ID"]);
71          }
72        });
73      }
74    });
```
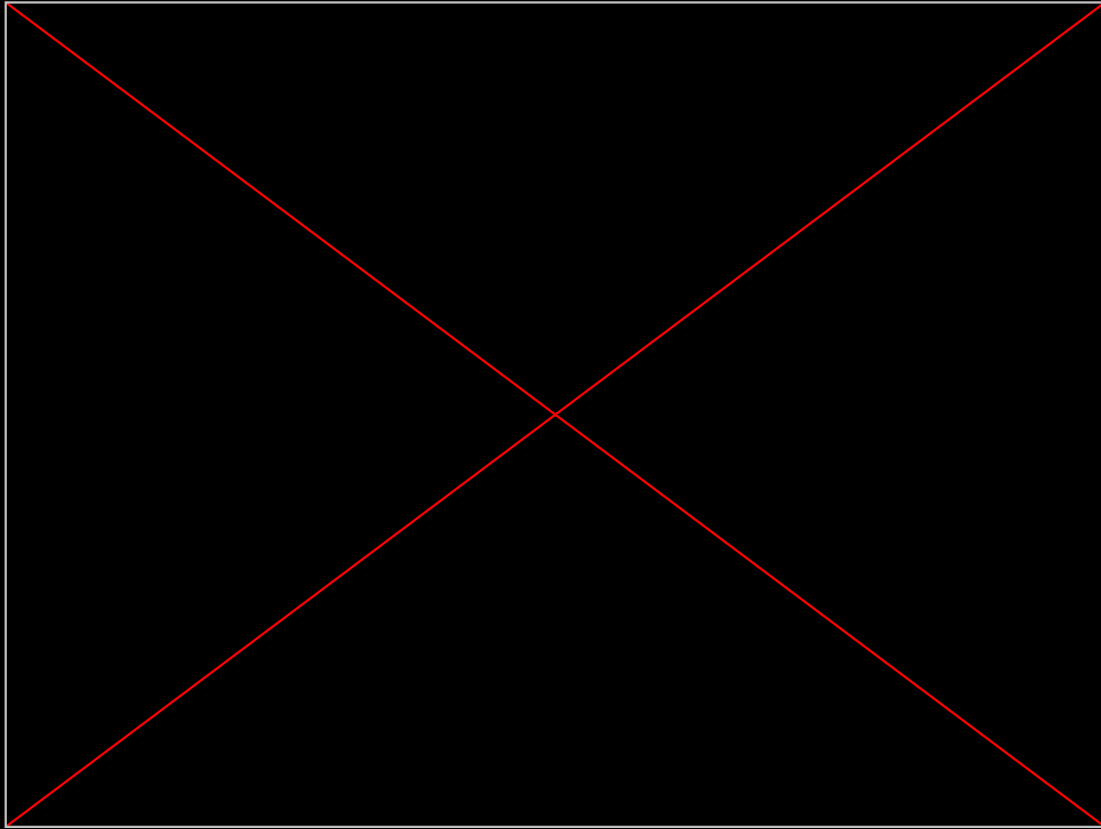
# Backend Logic

- Sort and order full list of 10-50 products by ranking
- Send results to ResultsPage

```javascript
76      // step 4: create the final array in the given format
77      const finalRecords = [];
78      let idCounter = 1; // for assigning numeric IDs
79
80      for (const record of validRecordsData) {
81        if (productIds.has(record["Product ID"])) {
82          finalRecords.push({
83            id: idCounter++,
84            name: record["Name"],
85            price: normalizePrice(record["Price"]),
86            description: "", // Leave blank for now
87            image: record["Image URL"] || "https://via.placeholder.com/150",
88          });
89        }
90      }
91
92      // return the formatted results
93      return finalRecords;
94    }
95
96    function ResultsPage() {
97      //? if readRecords() works as intended:
98      const allGifts = readRecords();
```

# Front-end

- *React as a front-end framework*
- *Reusability*
- *Navigation*
- *useStates*


- *component based architecture*
- *allow us to break our project down into reusable components*
- *reacts built in state management using useState helped us track important data such as user input, like age, interests, and budget*
- *the power of routing: routing in react makes navigating between different pages seamless and quick eliminating the wait time, which ensures a smooth single page application experience*

# Demo

Questions?