

Powering Mobile eCommerce via Data Science

Rue La La

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What is Rue La La?

- Flash sales with a focus on high end fashion
 - Themed boutiques curated by people

RueLaLa



ALL WOMEN MEN HOME TRAVEL K



St. John
Closing in 2 days



Luxe Shoe Sale: Step It WAY Up
Closing in 2 days



Rue
Boutiques

Search

4
Rue Now

Coming Soon

Account

What is Rue La La?

- Flash sales with a focus on high end fashion
 - Themed boutiques curated by people
- Not a fixed inventory model, à la Amazon
 - Sales at 8am, 11am, 3pm, 8pm
 - Over 100k styles turn over per day



ALL WOMEN MEN HOME TRAVEL K



Rue
Boutiques

Search

Rue Now
4

Coming Soon

Account

Mobile eCommerce & Data Science

What will be covered:

-  and CoreML
- What is Data Science?
- Its impact on mobile eCommerce

Mobile eCommerce & Data Science

What will be covered:

- ~~Swift and CoreML~~
- What is Data Science?
- Its impact on mobile eCommerce

What is Data Science?



“Derive Predictive power from data to improve Rue’s competitive position and profitability”

Data Science @ *RueLala*

- Personalized Emails
- Targeted Marketing Campaigns
- Personalized Shopping Experience
- Recommendation Engine
- ...

Shopping for the big night out



Shopping for the big night out



Shopping for the big night out



Z Zegna Linen-Blend Jacket

The product page features a central image of a man wearing a dark blue Z Zegna Linen-Blend Jacket over a white button-down shirt. The jacket has a subtle checkered pattern and a two-button closure. Below the image, the product name "Z Zegna Linen-Blend Jacket" is displayed, followed by the original price "\$649.99" and a discounted price "\$835.00". A note indicates "3 LEFT". At the bottom of the page are buttons for "ADD TO BAG" and "Buy with Apple Pay".

Design details notch lapel, left chest pocket, three front pockets, but **Z Zegna Linen-Blend Jacket** interior

- Two-button closure
 - Medium weight
 - 56% linen, 44% cotton
 - Lining: 100% cupro
 - Dry clean only
- Everything sold at Rue La La is 100% genuine. In some cases we purchase merchandise from trusted independent suppliers and not directly from the brand owner. In all cases we stand by the authenticity of every product sold on our site.

YOU MAY ALSO LIKE

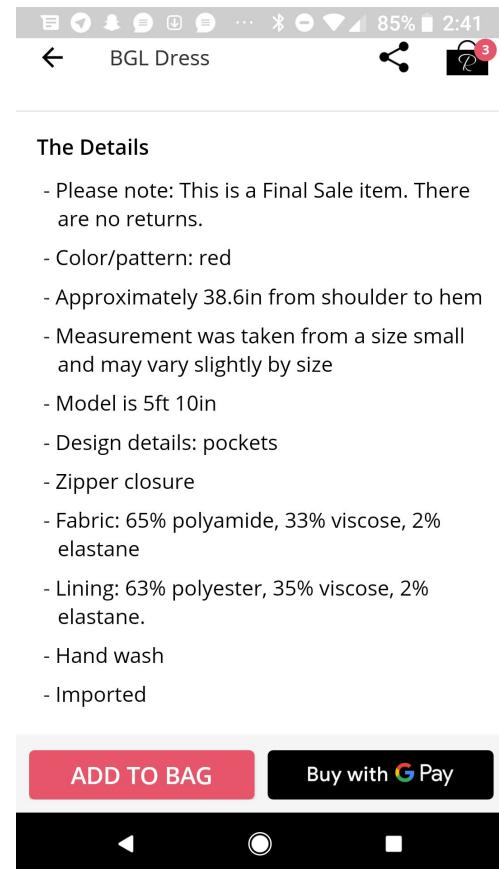
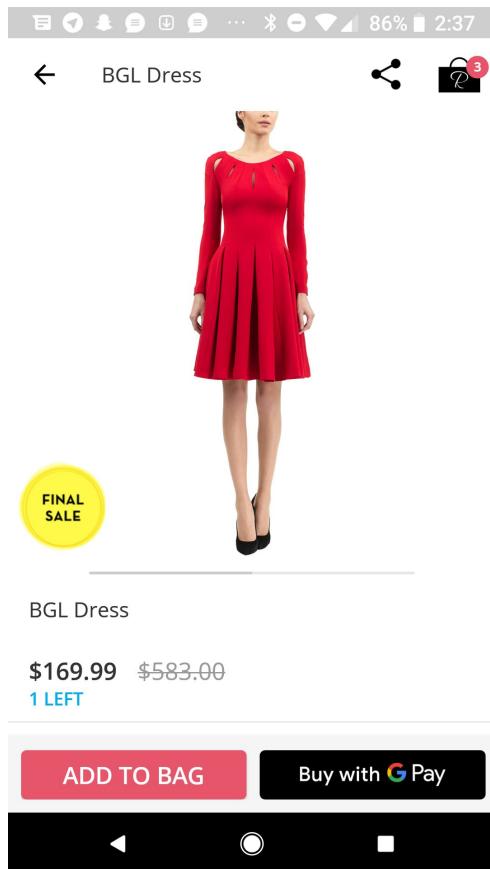


ADD TO BAG

Buy with Apple Pay

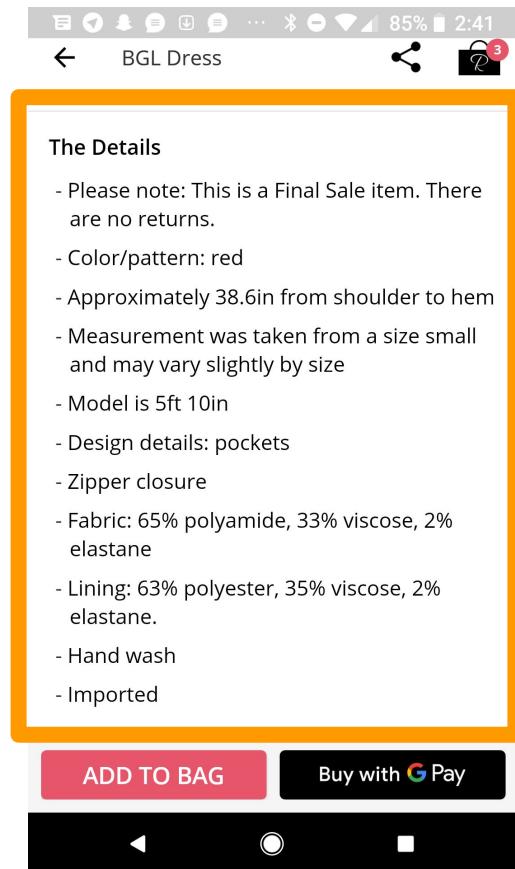
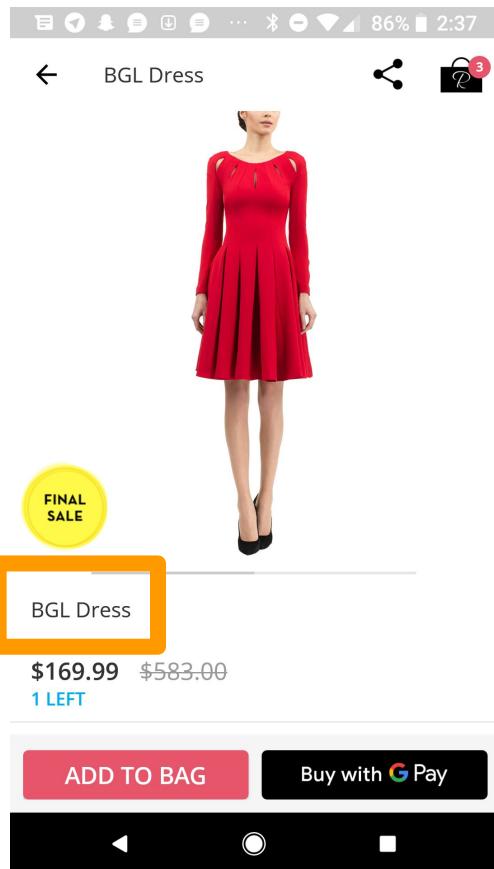
Text-Based Similar Product Recommendation

- *Raw Features:*



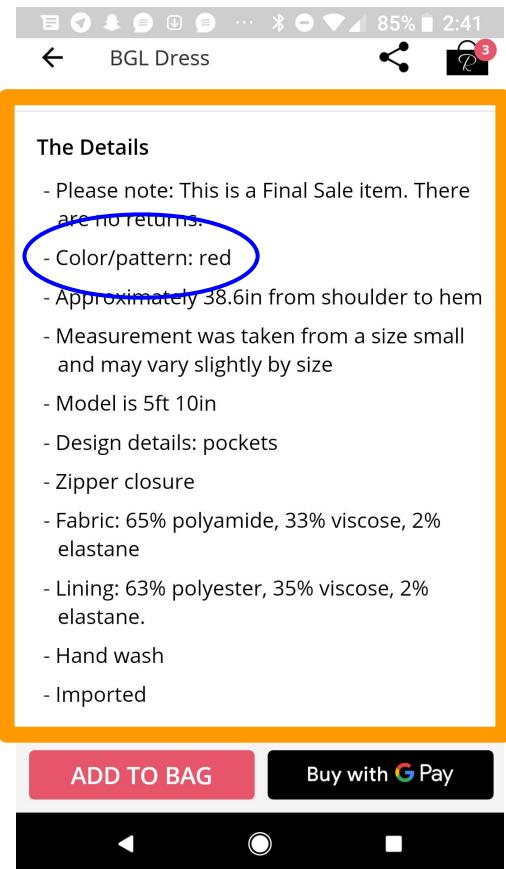
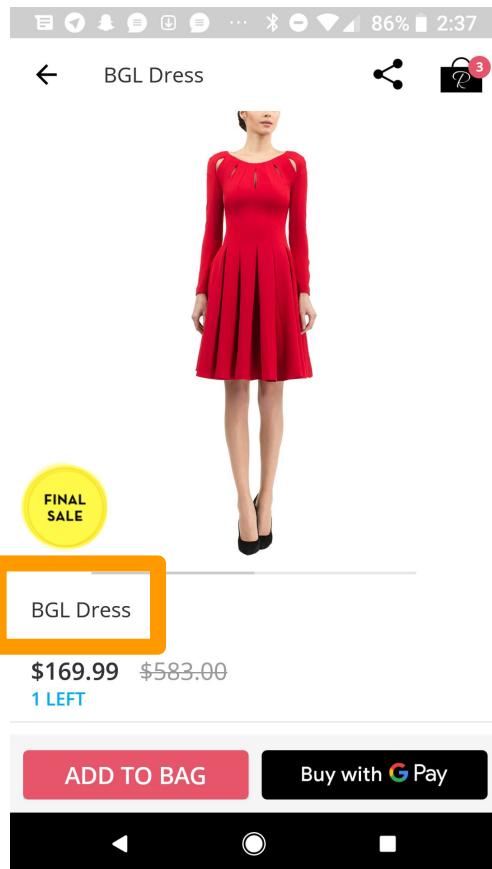
Text-Based Similar Product Recommendation

- *Raw Features:*



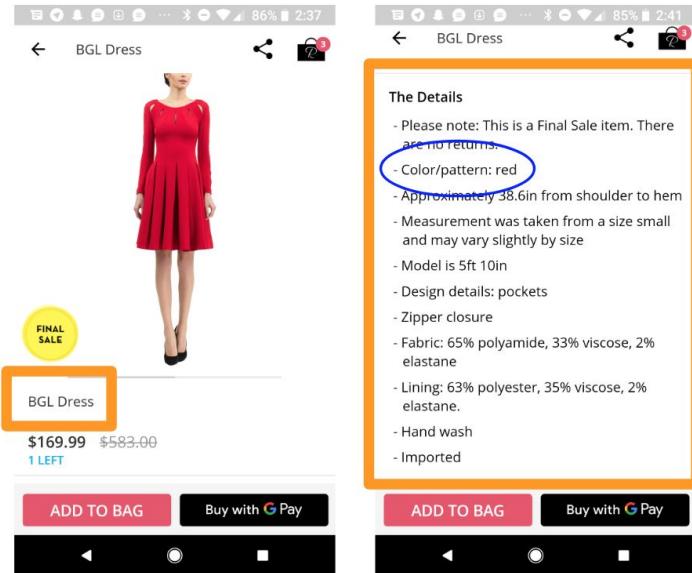
Text-Based Similar Product Recommendation

- *Raw Features:*



Text-Based Similar Product Recommendation

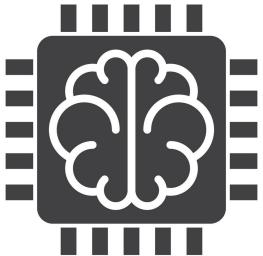
- *Raw Features:*



- *Curated Features:*

Product	Class	Subclass	Color	Vendor Color	Brand
BGL	Dress	Day Dress	Red	Red	BGL

Text-Based Similar Product Recommendation

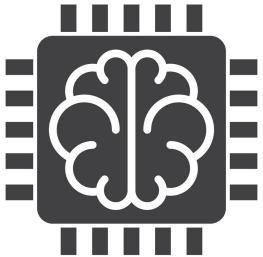


Model 1: Product Features

(TF-IDF): Calculates the relevance of a word in a corpus

Example: A-line Day Dress: A-line > Day > Dress

Text-Based Similar Product Recommendation



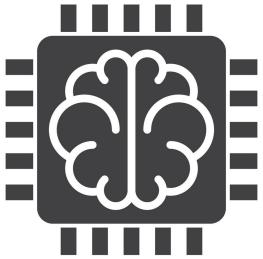
Model 1: Product Features

(TF-IDF): Calculates the relevance of a word in a corpus

Example: A-line Day Dress: A-line > Day > Dress



Text-Based Similar Product Recommendation



Model 2: Color Features

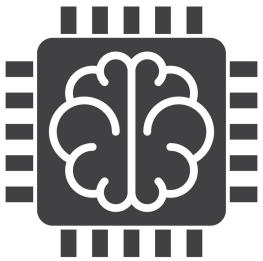
(word2vec): Connecting Vendor ad Rue's Colors

The Details

- Please note: This is a Final Sale item. There are no returns.
- Color/pattern: red
- Approximately 38.6in from shoulder to hem
- Measurement was taken from a size small and may vary slightly by size
- Model is 5ft 10in
- Design details: pockets
- Zipper closure
- Fabric: 65% polyamide, 33% viscose, 2% elastane
- Lining: 63% polyester, 35% viscose, 2% elastane.
- Hand wash
- Imported

Product	Class	Subclass	Color
BGL	Dress	Day Dress	Red

Text-Based Similar Product Recommendation



Model 2: Color Features

(word2vec):

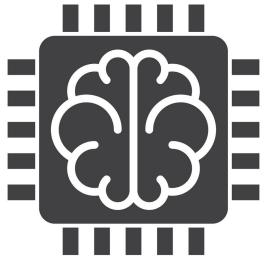
Word	Similarity Score to Red
wine	0.895
cherry	0.882
crimson	0.867
scarlet	0.865
flame	0.863



Color model



Text-Based Similar Product Recommendation



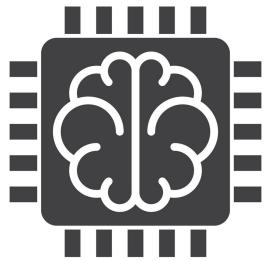
Model 3: Detail Embedding Model

(word2vec): Identifying semantically similar words

The Details

- Please note: This is a Final Sale item. There are no returns.
- Color/pattern: red
- Approximately 38.6in from shoulder to hem
- Measurement was taken from a size small and may vary slightly by size
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Text-Based Similar Product Recommendation

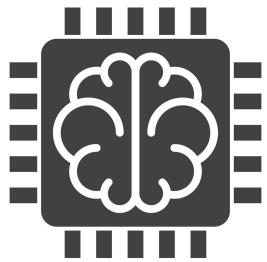


Model 3: Detail Embedding Model

(word2vec): Identifying semantically similar words



Text-Based Similar Product Recommendation



Model 1 + Model 2 + Model 3:



Stacked
Output





[←](#) [≡](#) **amazon**
prime

[🔍](#) [🔔](#) [🛒](#)

[📍](#) Deliver to Glen - Boston 02210



Rawlings
Rawlings 2018 Raptor Alloy T-Ball Bat (-12)



Style Name:
24"/12oz

\$19⁹⁹ \$28.90 Save \$8.91 (31%)
✓prime

Save an extra **\$0.47** at checkout.

FREE Delivery by **Wednesday**
if you order within 11 hrs 5 mins. [Details](#)



NORDSTROM

[🔍](#) [⬆️](#) [🔍](#)



Charles Henry
Off the Shoulder Dress
Item # 5200087
40% Off

NEW MARKDOWN
\$88
\$52.80

★★★★★ 774 Reviews

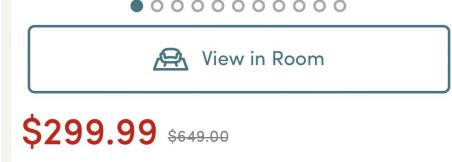


[⬅️](#) [➡️](#) [⬆️](#) [🔍](#)

Details
SKU VVRE2231

Bria 2-in-1 Convertible Crib
by Viv + Rae

★★★★★ 123



[View in Room](#)

\$299.99 \$649.00

“Customers who bought ‘x’ also bought...”

A screenshot of an Amazon search results page. At the top, there's a teal header with the Amazon logo, a search bar, and a bell icon. Below it, a dark blue bar says "Deliver to Glen - Boston 02210". The main content shows a grid of products: a woman in a bikini labeled "Fashionable women's swimwear Resortwear by Speedo", and a Rawlings baseball bat labeled "Rawlings 2018 Raptor Alloy T-Ball Bat (-12)".



A detailed view of the Rawlings 2018 Raptor Alloy T-Ball Bat. It has a black and yellow camouflage pattern on the barrel and a bright yellow handle. Below the image is a box containing the style name "24"/12oz".

\$19⁹⁹
\$28.90 Save \$8.91 (31%)
prime

Save an extra \$0.47 at checkout.

FREE Delivery by Wednesday
if you order within 11 hrs 5 mins. [Details](#)

A Nordstrom product page for a Charles Henry Off the Shoulder Dress. The dress is shown on a mannequin in a rich red color. To the right is a close-up of the hem. Below the dress are five color swatches: teal, black, red, dark red, and blue. The text "NEW MARKDOWN" is above the brand name. The product details include: "Charles Henry Off the Shoulder Dress Item # 5200087", "40% Off", and "774 Reviews".

A product page for the Bria 2-in-1 Convertible Crib. The title is "Bria 2-in-1 Convertible Crib" by Viv + Rae. It has a 5-star rating with 123 reviews. The crib is shown in a dark navy blue color. A "View in Room" button is at the bottom. The price is \$299.99, down from \$649.00. Other details include "SKU VVRE2231" and a "Details" link.

“Customers who bought ‘x’ also bought...”



Frequently bought together

	+		+	
<input checked="" type="checkbox"/> This item: SKLZ Reduced Impact Safety Baseballs (Pack of 2) \$6.99				
<input checked="" type="checkbox"/> MacGregor Batting Tee \$15.99	>			
<input checked="" type="checkbox"/> Rawlings 2018 Raptor Alloy T-Ball Bat (-12) \$19.99	>			
Total price: \$42.97				
Add all three to Cart				

Sponsored products related to this item



FREQUENTLY BOUGHT TOGETHER

VALENTINO GARAVANI \$1,075
VALENTINO GARAVANI \$1,095
VALEN' GARAV \$995

FREQUENTLY BOUGHT TOGETHER

VALENTINO GARAVANI \$1,075
VALENTINO GARAVANI \$1,095
VALEN' GARAV \$995

FREQUENTLY BOUGHT TOGETHER

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VALEN' GARAV \$995

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VALENTINO GARAVANI \$1,075
VALENTINO GARAVANI \$1,095
VALEN' GARAV \$995

FREQUENTLY BOUGHT TOGETHER



Details SKU VVRE2231

Recommended Accessories

+ + +

Bria 2-in-1 Convertible Crib
\$299.99

Pure Core 5" Non-Toxic Crib Mattress
\$179.00

Stain Protection Crib Mattress Pad
\$38.99

Total Price: \$517.98

Add Items to Cart

Shop This Collection

Highlights

Diapers & Beers



Diapers & Beers



Diapers & Beers



Diapers & Beers



Frequently Purchased Together



Milk, eggs, sugar, bread,
lettuce



Milk, eggs, bread, cereal,
diapers, beer

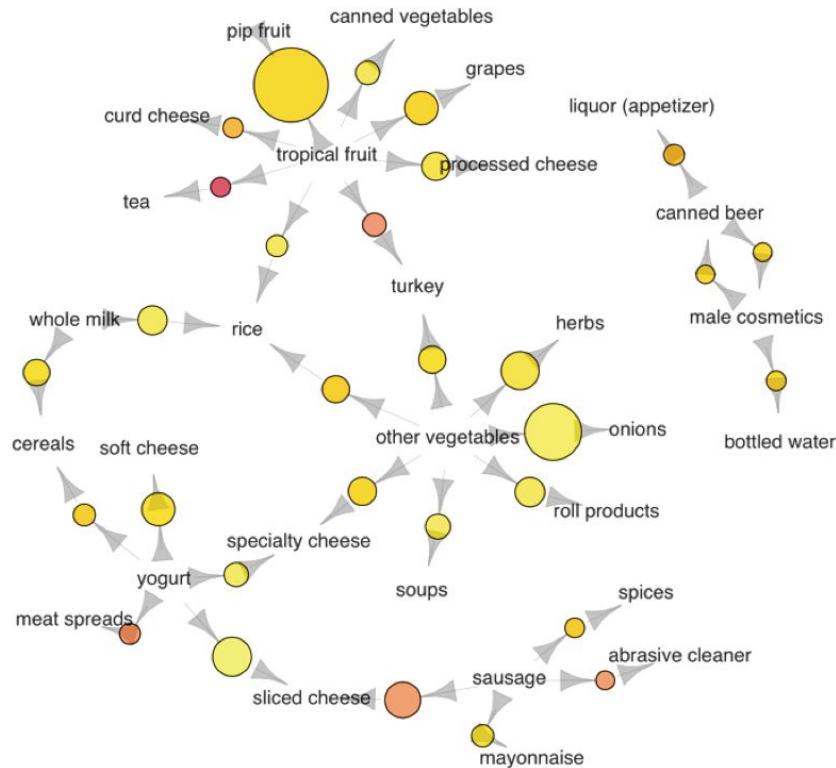


Lettuce, bread, bear,
sugar

- What products are often purchased together?

- bread ⇒ peanut-butter

Frequently Purchased Together



Association Rules: Rue La La

Challenges: Dynamic Inventory, New Brands

The image shows a screenshot of an Amazon product page. On the left, there is a white box containing the Amazon logo and a product image of a white jar of Pond's Dry Skin Cream with a blue lid. A red arrow points from this image to the right side of the screen. On the right, there is a section titled "Customers who bought this item also bought". This section displays seven different Pond's skincare products, each with an image, name, price, and rating. The products include:

- Pond's Cold Cream Cleanser 9.5 oz: ★★★★☆ 256 \$7.57
- Pond's Correcting Cream, Clarendon B3 Dark Spot Normal to Dry Skin 7 oz, Pack of 2: ★★★★☆ 1,890 \$12.92 prime
- Pond's Cold Cream, Cleanser, 3.5 oz: ★★★★☆ 288 \$5.14 prime
- Pond's Cream Humectant Moistening, 14oz Crema Hidratante y Magnificante 5 De Ponds 400gr: ★★★★★ 14 \$9.48 - \$22.97
- Pond's Cold Cream Cleanser 6.10 oz: ★★★★★ 6 \$6.10 - \$39.99
- Pond's Cold Cream Cleanser 3.5 oz (Pack of 3): ★★★★★ 115 \$10.97 prime
- Pond's Rejuveness Anti-Wrinkle Cream 14oz, Crema Ponds Rejuvenadora Contra-Las Arrugas 400gr: ★★★★★ 36 \$9.50

Page 1 of 8

Association Rules: Rue La La

Challenges: Dynamic Inventory, New Brands

Rue La La



Association Rules: Rue La La

Challenges: Dynamic Inventory, New Brands

Rue La La



Association Rules: Rue La La

Challenges: Dynamic Inventory, New Brands

Rue La La



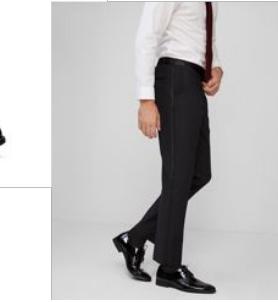
BUT



Association Rules: Rue La La

Challenges: Dynamic Inventory, New Brands

Rue La La



BUT



Association Rules: Rue La La

Challenges: Dynamic Inventory, New Brands

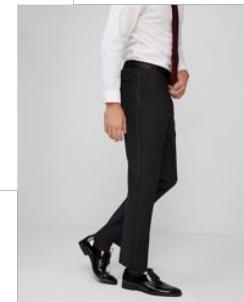
Rue La La



Association Rules: Rue La La

Challenges: Dynamic Inventory, New Brands

Rue La La



BUT



Association Rules: Rue La La

Rules

Computed For the past 12 months



Live Items on Jun 14th



Association Rules: Rue La La

Rules

Computed For the past 12 months



Live Items on Jun 14th



Association Rules: Rue La La



FINAL SALE

Charles David
Charles David Corona Sandal

\$89.99 \$259.00
5 LEFT

SIZE — [SIZE CHART](#)

6	6.5	7	7.5	8	8.5	9	9.5	10
---	-----	---	-----	---	-----	---	-----	----

Quantity

[ADD TO BAG](#)

SHIPPING & RETURNS

- You have free standard shipping thanks to **THE RUE 365®**.
- Ships in 1-2 business days. This item ships directly from Rue to you.
- This item is Final Sale and cannot be returned.

THE DETAILS

- Color/material: fuchsia multicolor textile
- Design details: suede trim, bow accents
- Lightly padded leather insole
- Smooth leather sole
- 3.25in heel
- Please note: All measurements are approximate and were taken from a size 7; slight variations may occur.

HOVER TO ZOOM



Text-Based Similarity



FINAL SALE

Catherine Catherine Malandrino
Catherine Catherine Malandrino Albreé Sandal

\$49.99 \$80.00

SIZE

6	6.5	7	7.5	8	8.5	9	10
---	-----	---	-----	---	-----	---	----

Quantity

[SELECT THE ONE YOU WANT. IF IT'S UNAVAILABLE, YOU CAN STILL WANT IT.](#)

[ADD TO BAG](#)

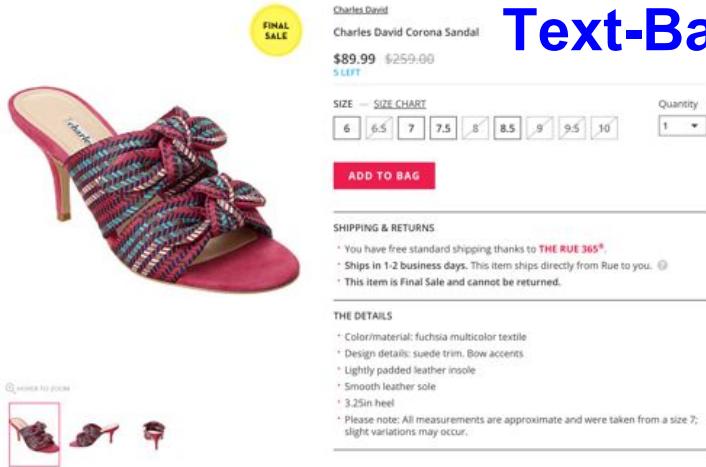
SHIPPING & RETURNS

- You have free standard shipping thanks to **THE RUE 365®**.
- Ships in 1-2 business days. This item ships directly from Rue to you.
- This item is Final Sale and cannot be returned.

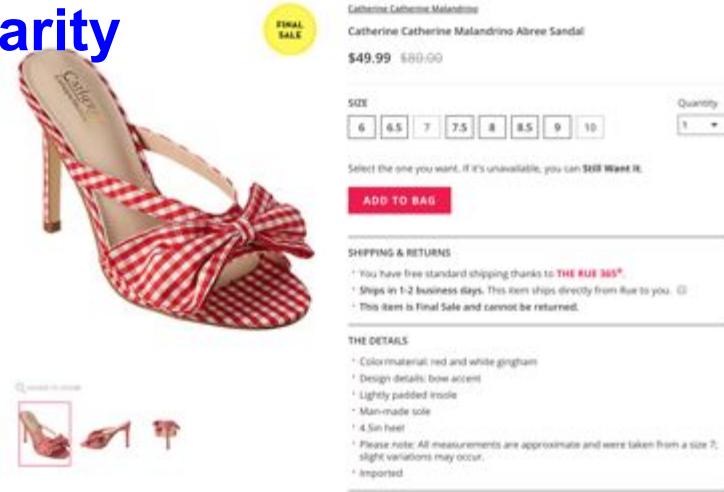
THE DETAILS

- Color/material: red and white gingham
- Design details: bow accent
- Lightly padded insole
- Man-made sole
- 4.5in heel
- Please note: All measurements are approximate and were taken from a size 7; slight variations may occur.
- Imported

Association Rules: Rue La La



Text-Based Similarity



Personalized Experience



RueLala



ALL WOMEN MEN HOME TRAVEL K



St. John
Closing in 2 days



Luxe Shoe Sale: Step It WAY Up
Closing in 2 days



Rue
Boutiques

Search

Rue Now
Coming Soon

Account

Boutiques curated
by humans

RueLala



ALL WOMEN MEN HOME TRAVEL K



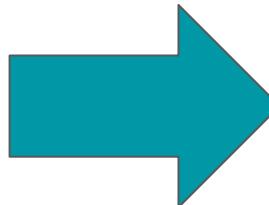
St. John

Closing in 2 days



Luxe Shoe Sale: Step It WAY Up

Closing in 2 days



Rue
Boutiques

Search

Rue Now

Coming Soon

Account

ALL WOMEN MEN HOME TRAVEL K



St. John
Closing in 2 days



Luxe Shoe Sale: Step It WAY Up
Closing in 2 days



Rue
Boutiques

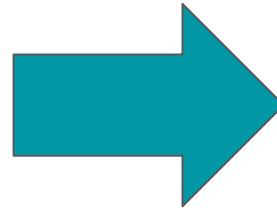
Search

Coming Soon

Coming Soon

Account

For Glen



ALL WOMEN MEN HOME TRAVEL K



Boat Shoes to Slip-Ons for Her & Him: Featuring Sperry
Closing in 1 day



The Sheet & Duvet Blowout. Savings? Stacked.
Closing in 6 days



Rue
Boutiques

Search

Coming Soon

Coming Soon

Account

ALL WOMEN MEN HOME TRAVEL K



St. John
Closing in 2 days



Luxe Shoe Sale: Step It WAY Up
Closing in 2 days



Rue
Boutiques

Search

Rue Now

Coming Soon

Account

ALL WOMEN MEN HOME TRAVEL



Your Weekend Wardrobe: Club-to-Couch Essentials
Closing in 1 day



Top 200 Furniture & Decor Picks. Project, complete.
Closing in 4 days



Rue
Shop

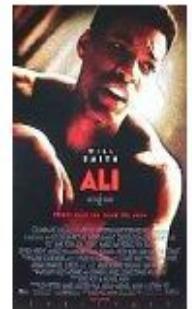
Search

Coming Soon

Account

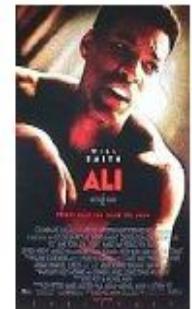
NETFLIX

Netflix and chill



User 1	1	5	3	4	3
User 2	4	1	5	2	5
User 3	2	?	3	5	4

Netflix and chill

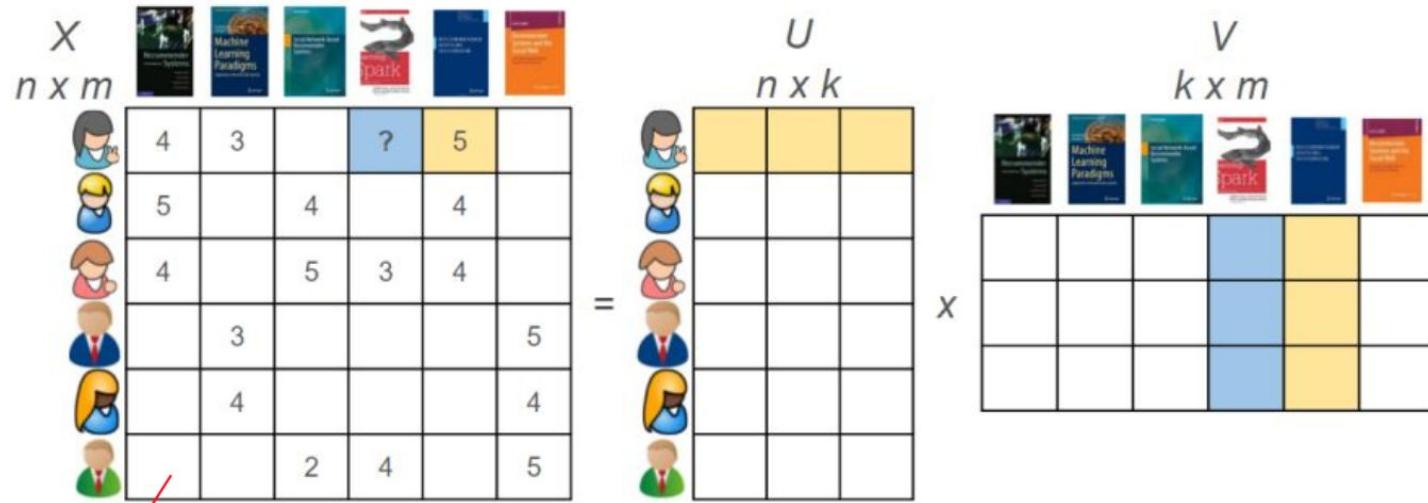


User 1	1	5	3	4	3
User 2	4	1	5	2	5
User 3	2	5	3	5	4

User 3 is more similar to user 1!

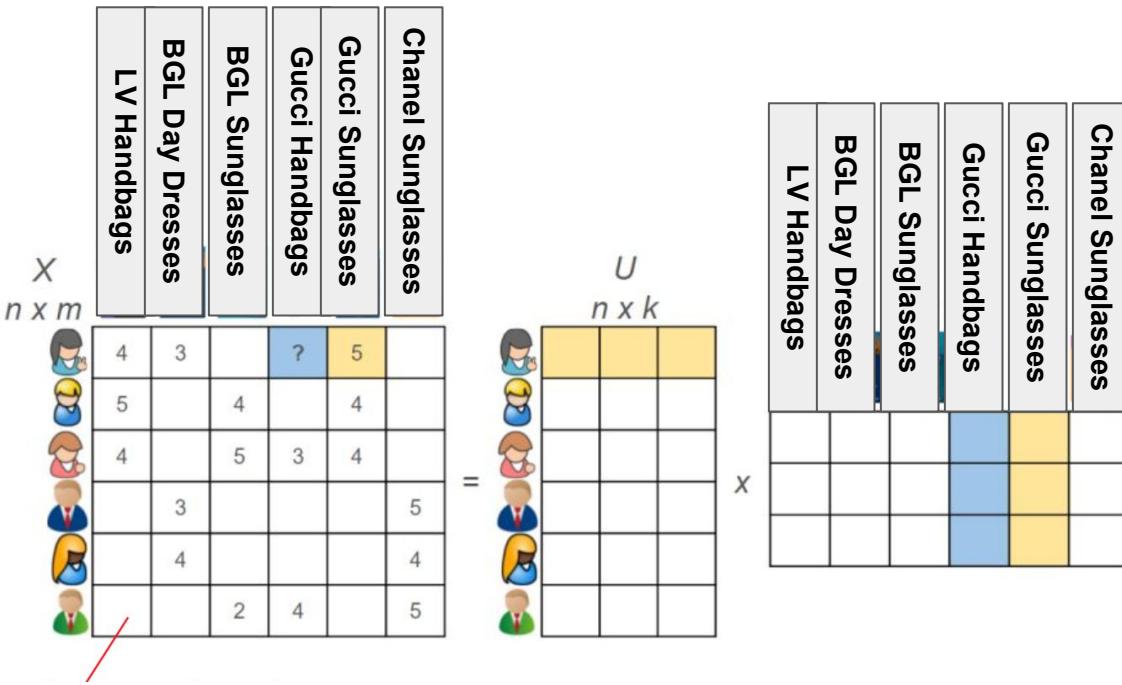
Collaborative Filtering

Quick Recap:



Empty cell means user has not seen the book

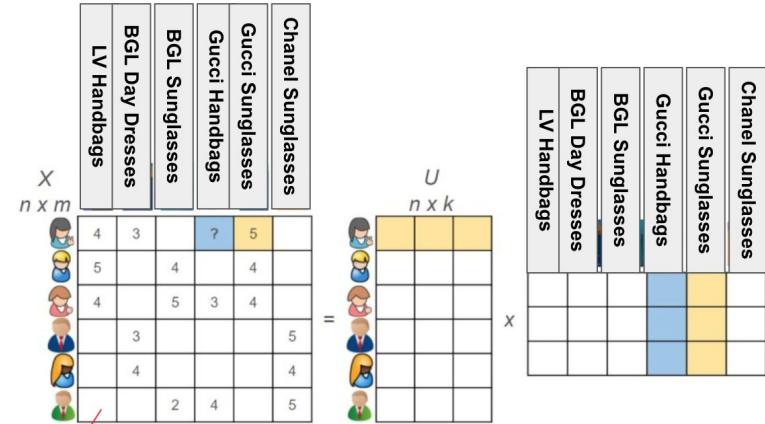
Collaborative Filtering



Empty cell means user has not seen the
subclass brand

Collaborative Filtering

How do we fill the rating matrix?



Empty cell means user has not seen the subclass brand

We use product page clicks and views, purchases, “SFI”, and freshness to simulate product ratings!

Personalizing the experience

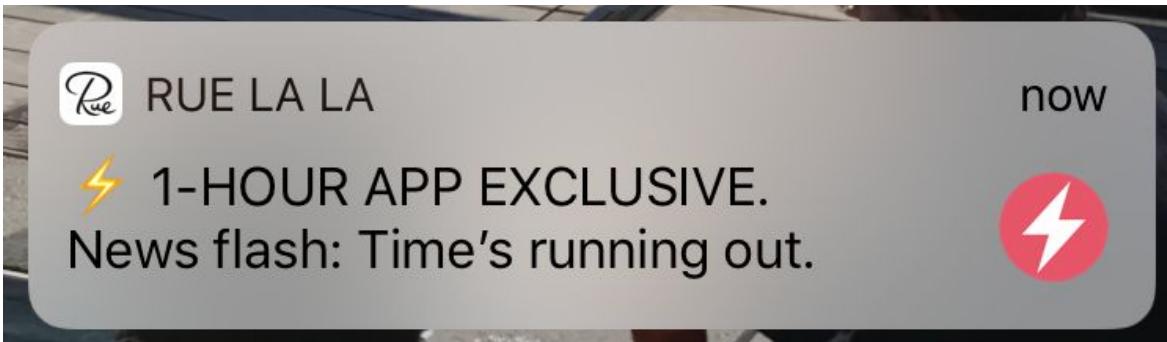
- Powered by collaborative filtering
- A different experience for every shopper
- Make it fun and memorable
- Keep it “Mobile First”

Bringing the ↘ to Flash Sales

- Make it fun and memorable
- Keep it “Mobile First”

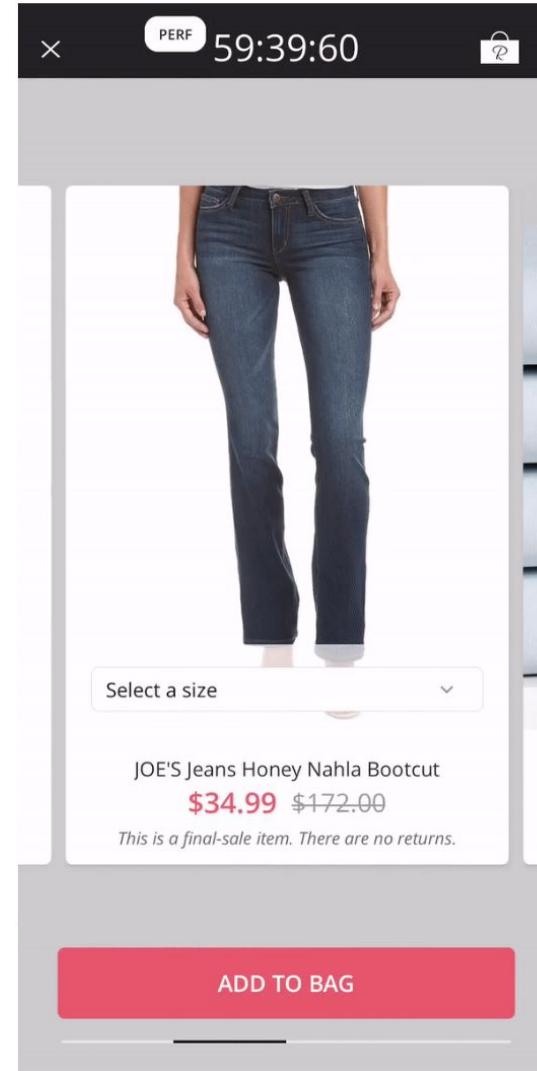
Bringing the ⚡ to Flash Sales

- Make it fun and memorable
- Keep it “Mobile First”
- It starts with a push!



Bringing the ↘ to Flash Sales

- Curated 1 hour sales
- Drive off hour traffic
- Fun and mobile first



Drive conversion through urgency



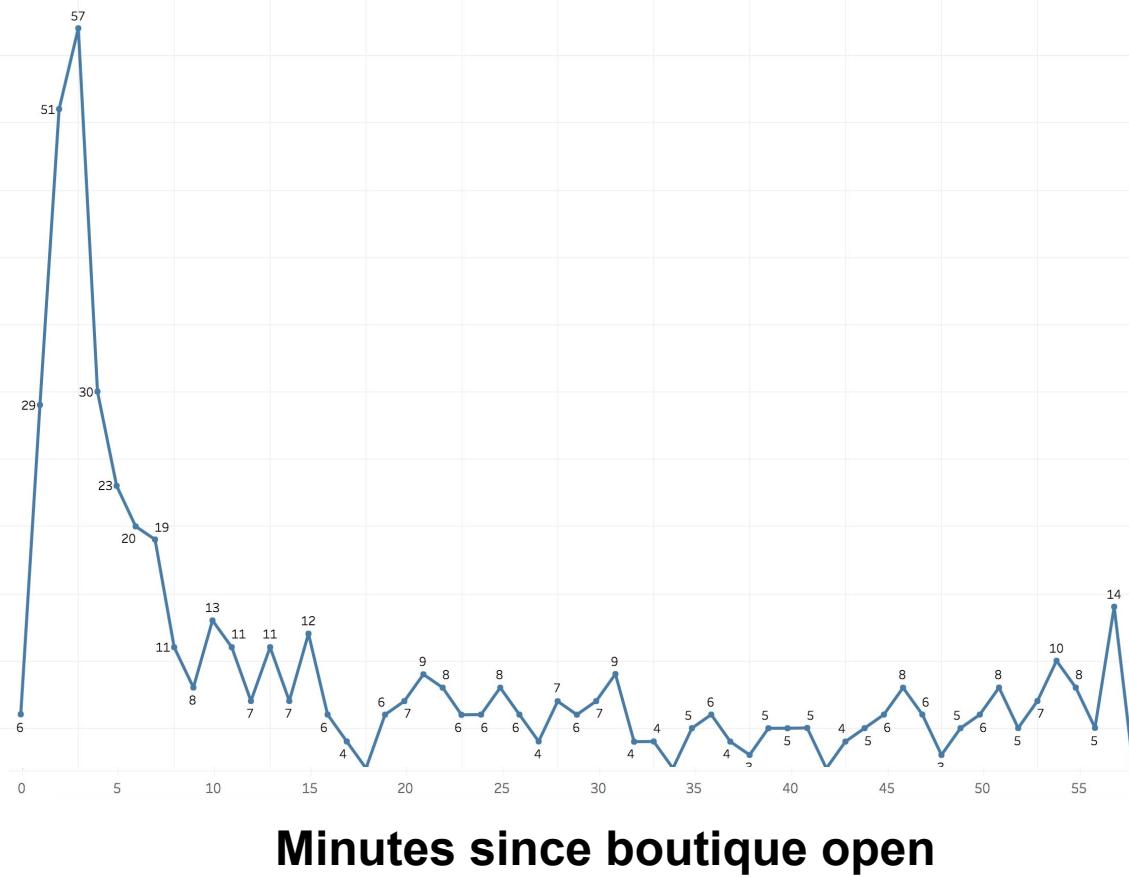
X PERF 59:39:60

The product page displays a pair of dark blue jeans on a mannequin. Below the image is a dropdown menu labeled "Select a size". The product details show the item name "JOE'S Jeans Honey Nahla Bootcut", the original price "\$172.00", and the sale price "\$34.99". A note below states "This is a final-sale item. There are no returns." At the bottom is a large red button labeled "ADD TO BAG".

JOE'S Jeans Honey Nahla Bootcut
\$34.99 \$172.00
This is a final-sale item. There are no returns.

ADD TO BAG

Orders



Drive conversion through urgency

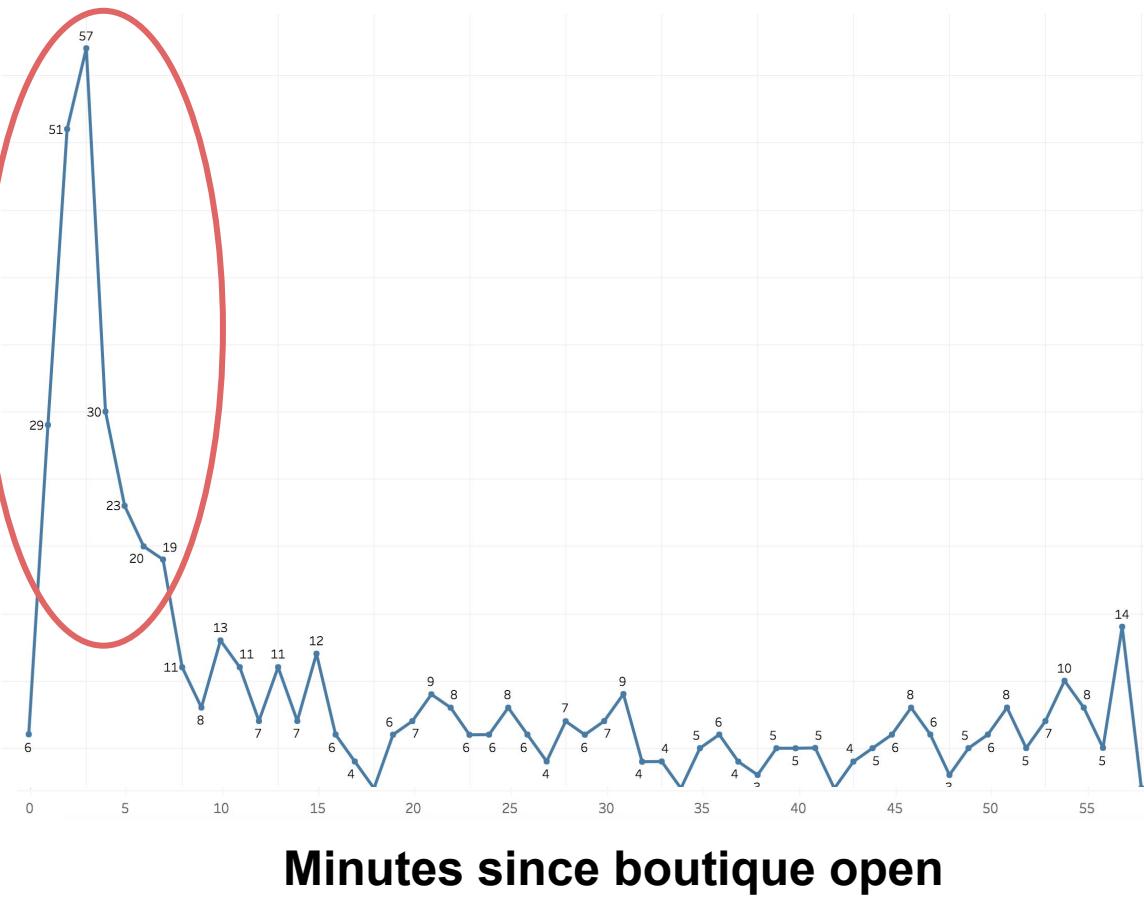


X PERF 59:39:60

The product image shows a woman wearing dark blue jeans. Below the image is a dropdown menu labeled "Select a size". The product details show the item name and a price comparison: \$34.99 vs \$172.00. A note states, "This is a final-sale item. There are no returns." At the bottom is a large red "ADD TO BAG" button.

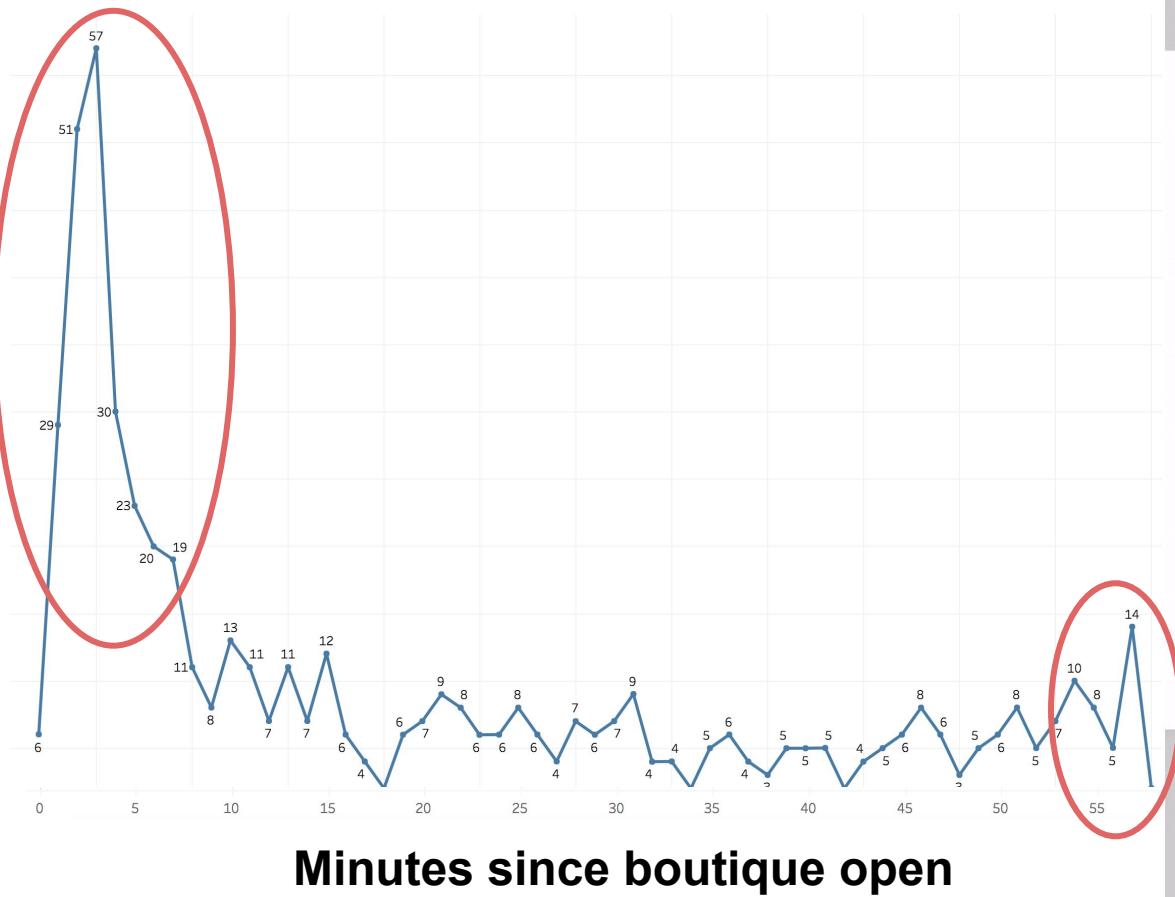
JOE'S Jeans Honey Nahla Bootcut
\$34.99 \$172.00
This is a final-sale item. There are no returns.
ADD TO BAG

Orders

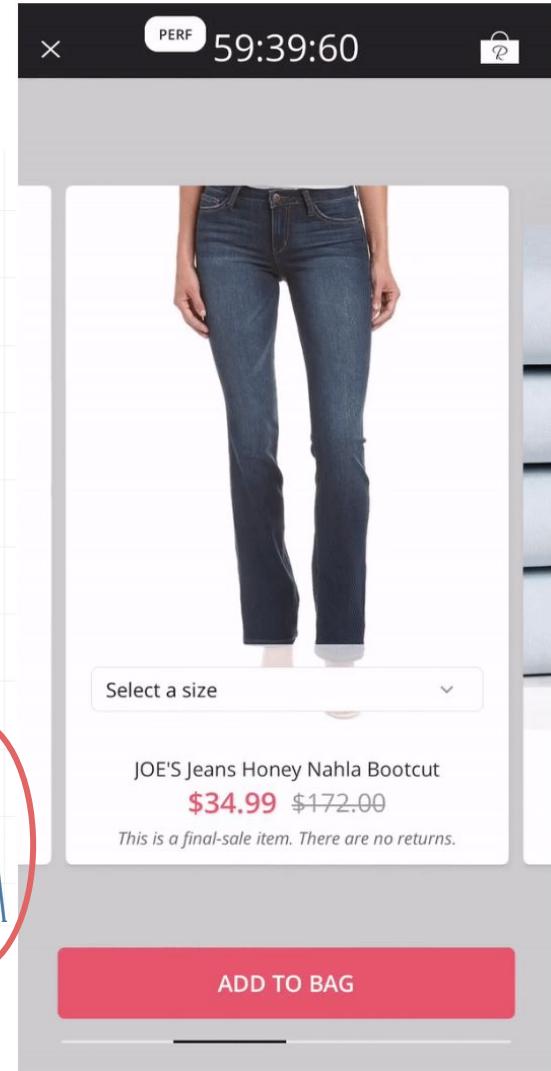


Drive conversion through urgency

Orders

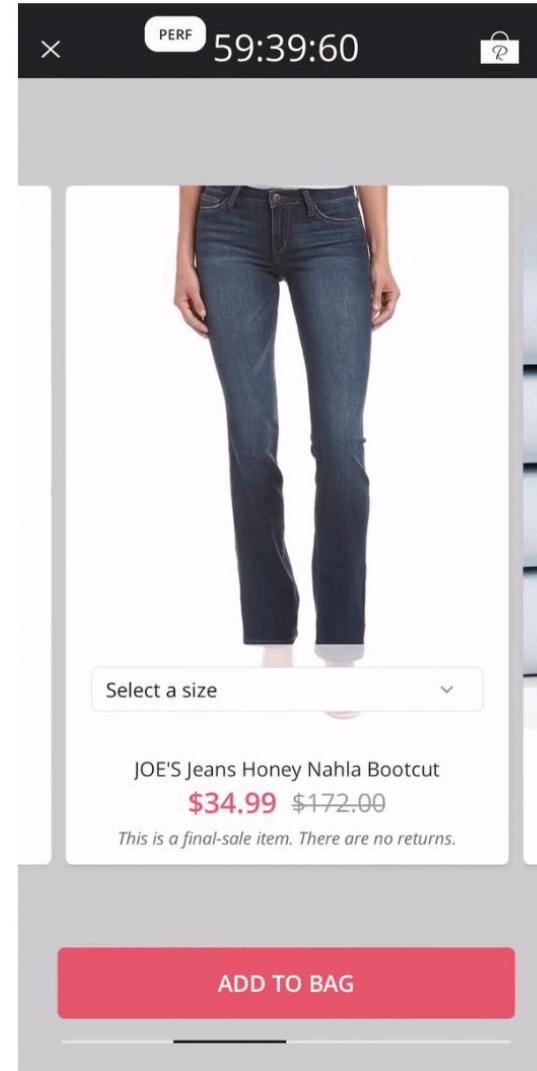


Minutes since boutique open



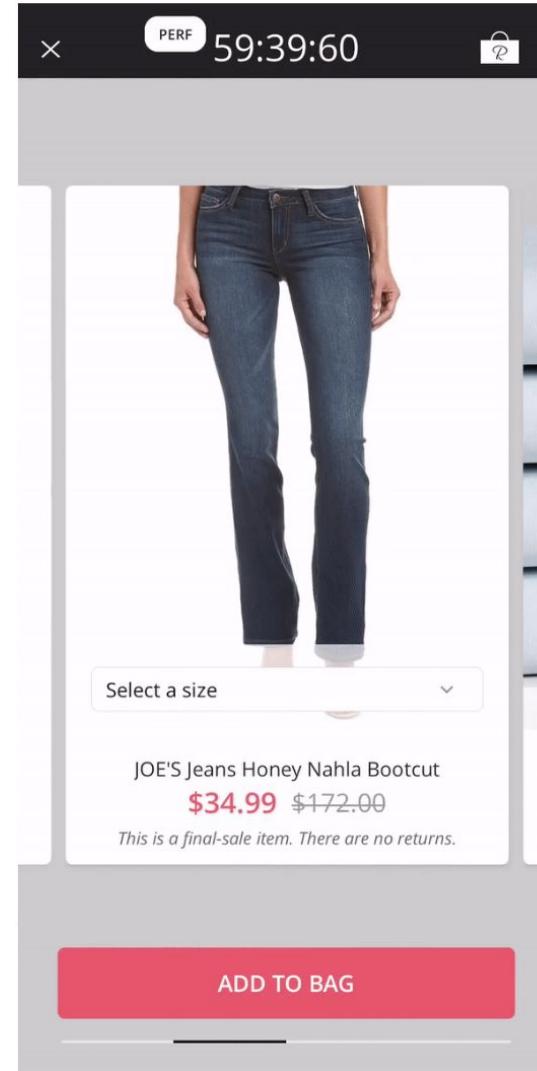
Personalizing the experience

- Recommend products from the member's favorite categories
 - *E.g. Pants, bedding, accessories*



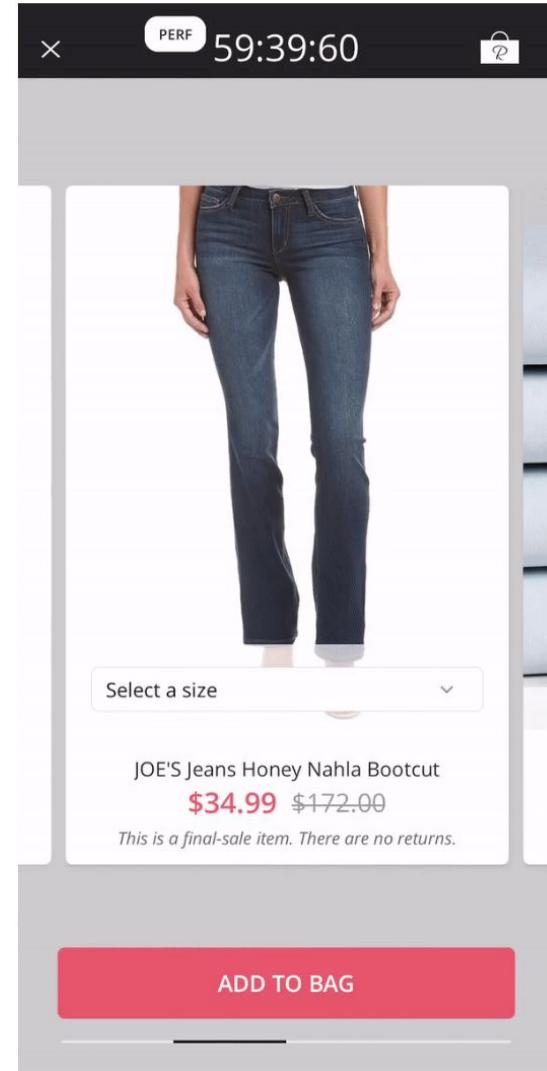
Personalizing the experience

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- Dynamic inventory becomes a plus



Personalizing the experience

- Recommend products from the member's favorite categories
 - *E.g. Pants, bedding, accessories*
- Dynamic inventory becomes a plus
- No longer scheduled or curated by humans



Data Science @ *RueLala*

- Personalized Emails
- Targeted Marketing Campaigns
- Personalized Shopping Experience
- Recommendation Engine
- ...

Powering the future

- Data science is ubiquitous

Powering the future

- Data science is ubiquitous
- Developers, data scientists and (UX) designers!



Powering the future

- Data science is ubiquitous
- Developers, data scientists and (UX) designers!



- Data science will empower different platforms and industries!

Thank you!

Rue La La

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