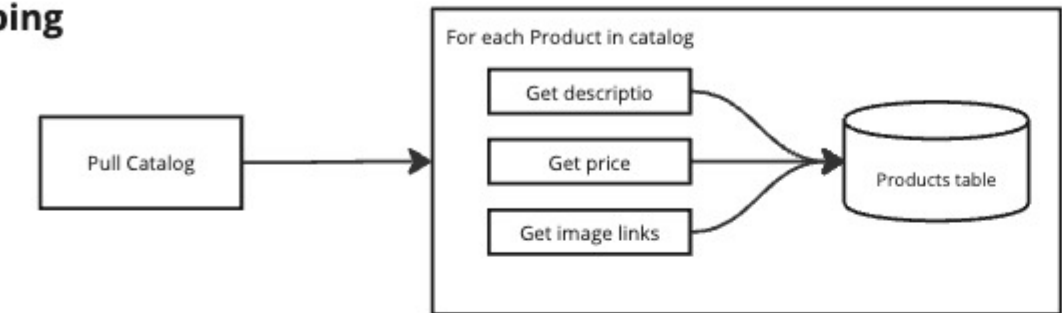
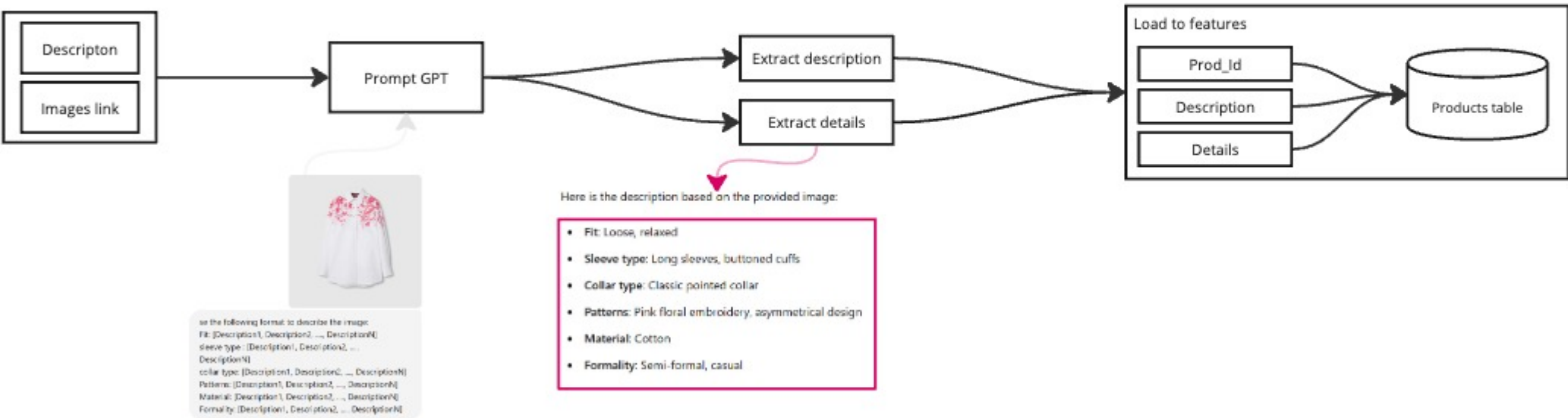


# Loading strategy

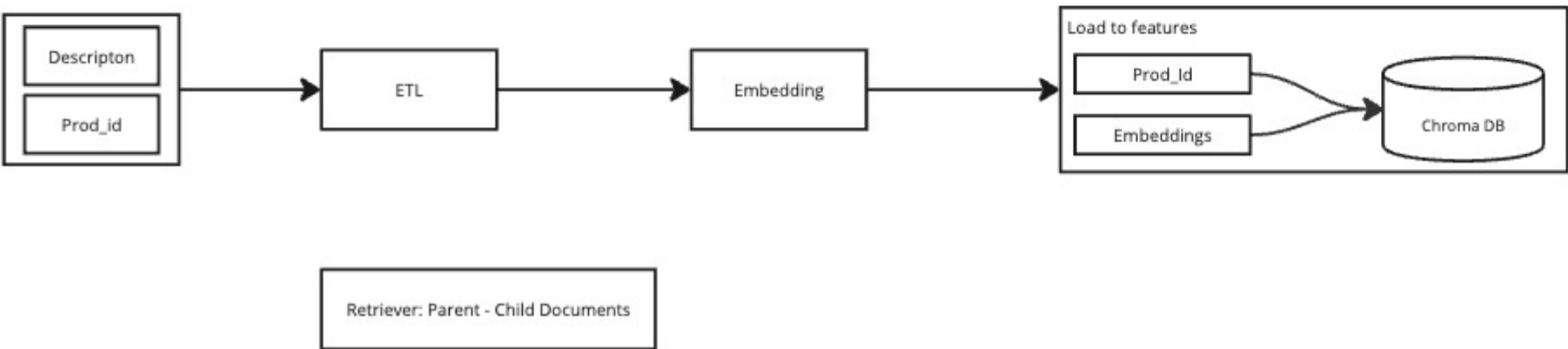
## Scrapping



## Feature creation

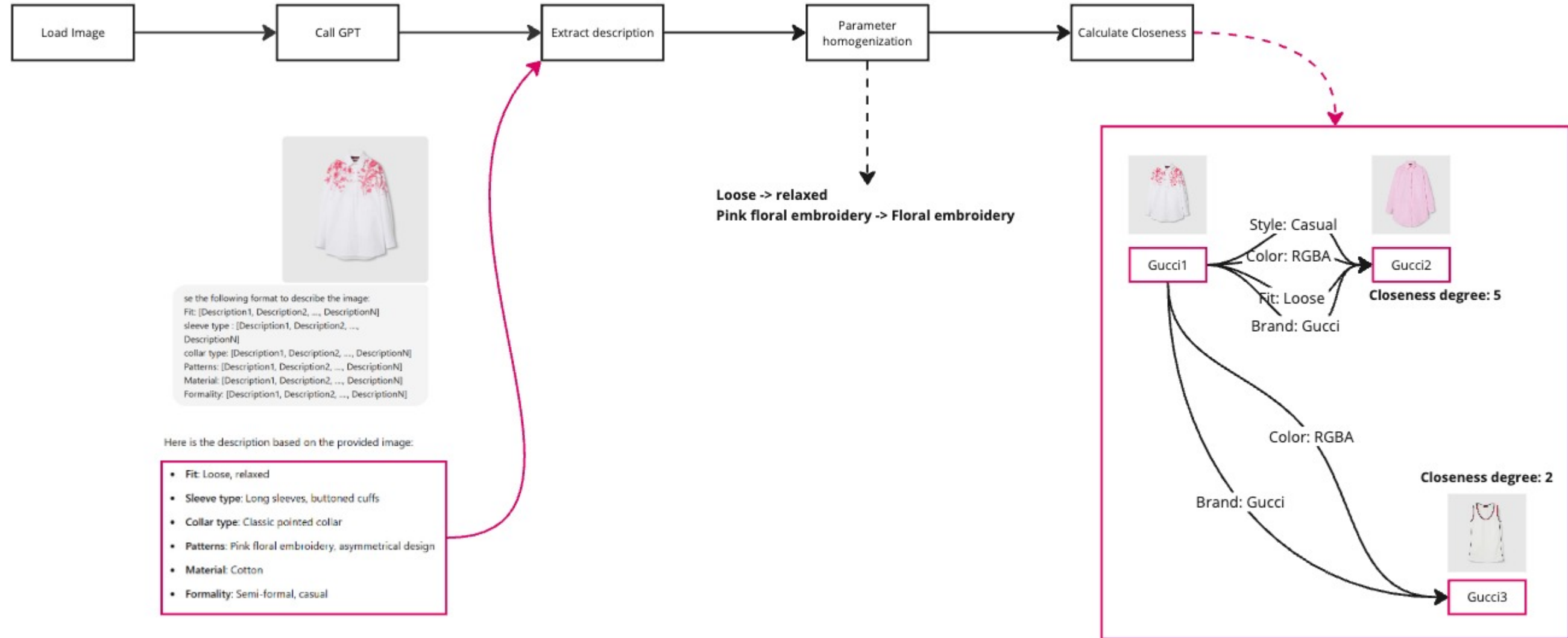


## Embeddings



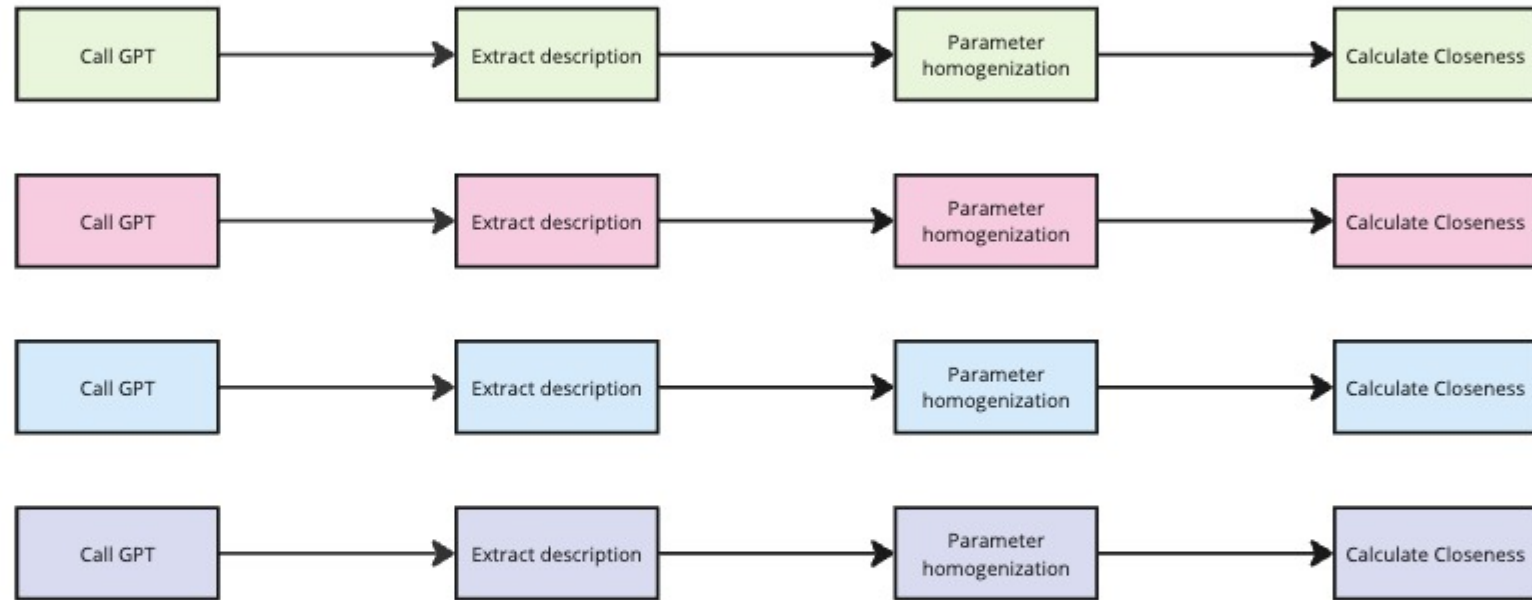
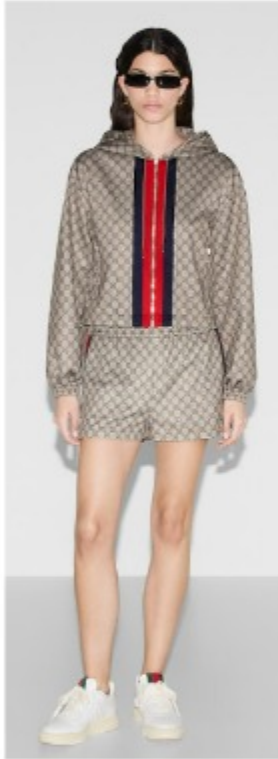
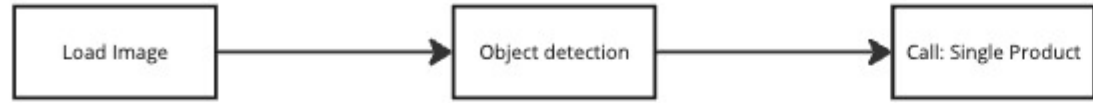
# Retrieval strategy: Single product

## Feature creation

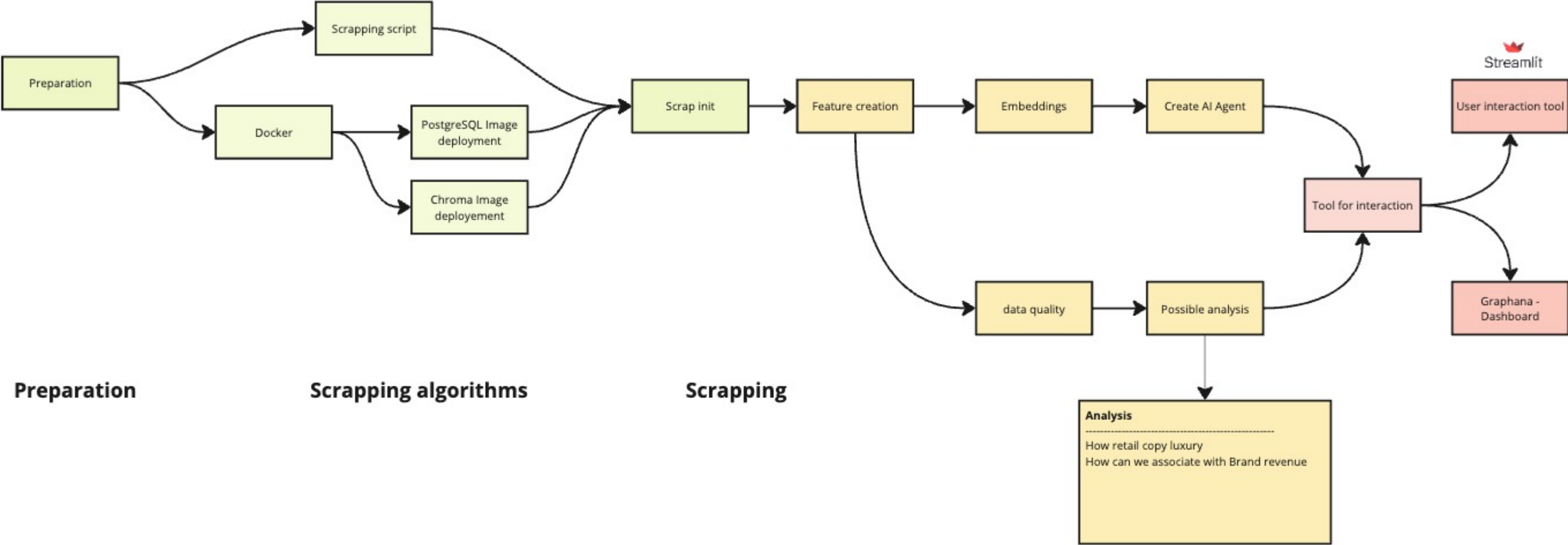


# Retrieval strategy: Clothing set

## Feature creation



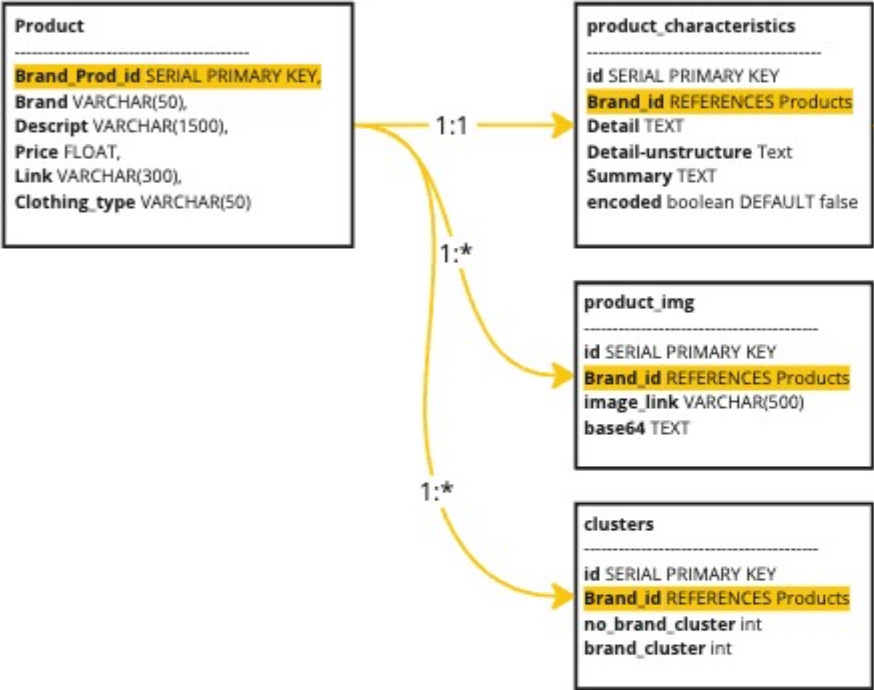
# Roadmap



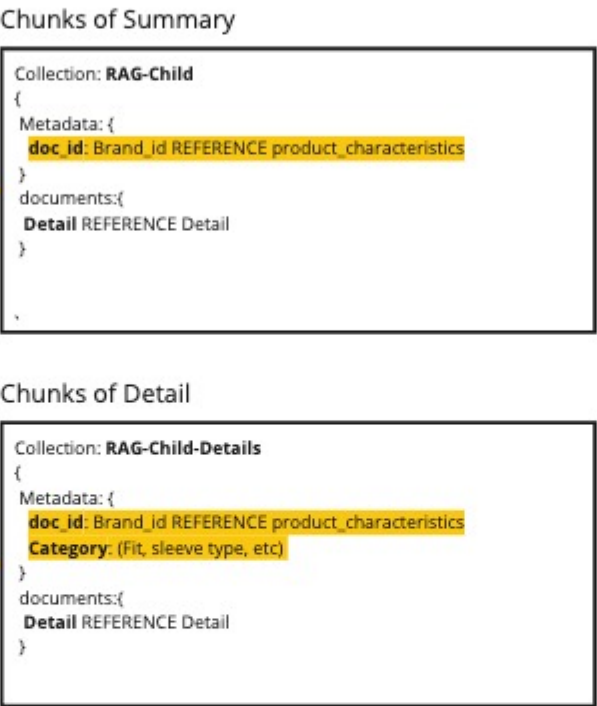
# Schemas

## Databases

### PostgreSQL: Relational database

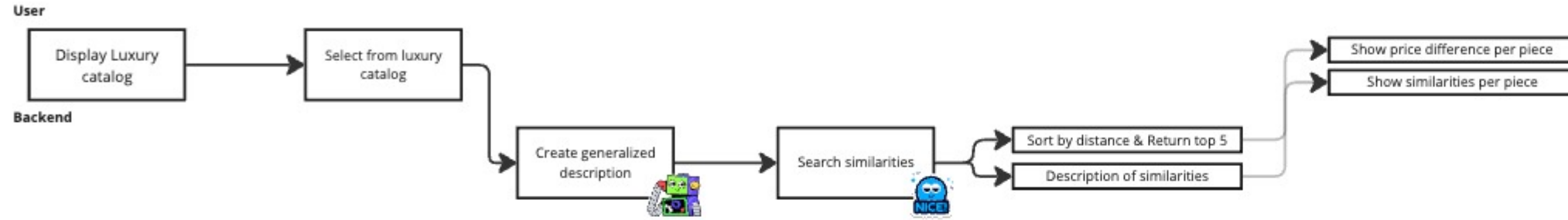


### ChromaDB: Vector database (Embedding algo: all-mpnet-base-v2)

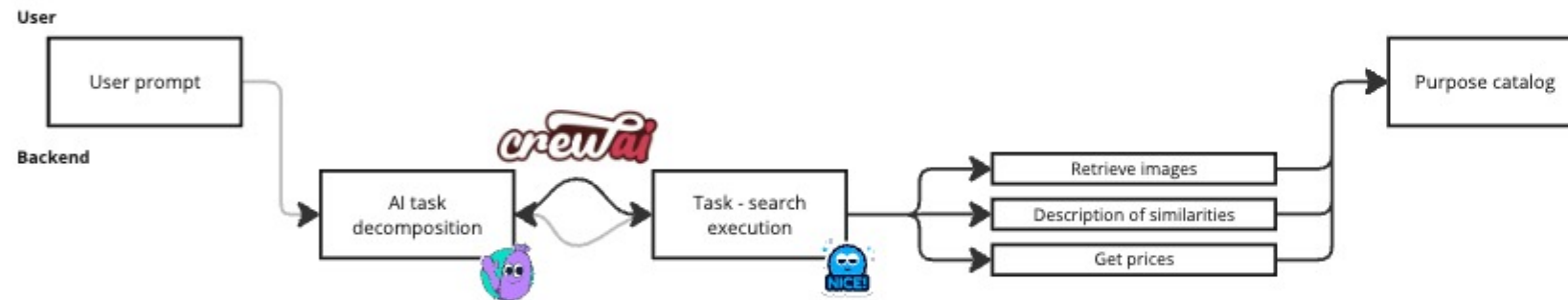


# Features & Agents

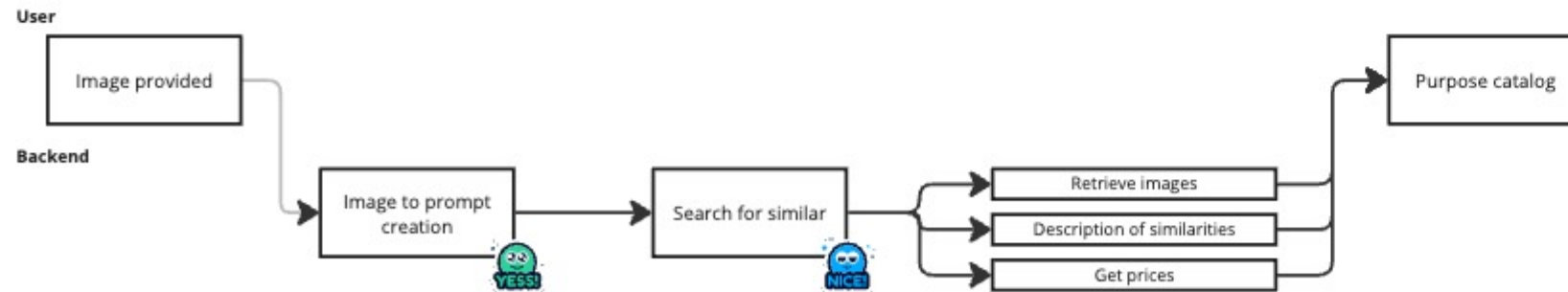
## Find similar pieces from luxury brands in retail brands



## Find pieces from user prompt description ( Text prompt to suggestions)

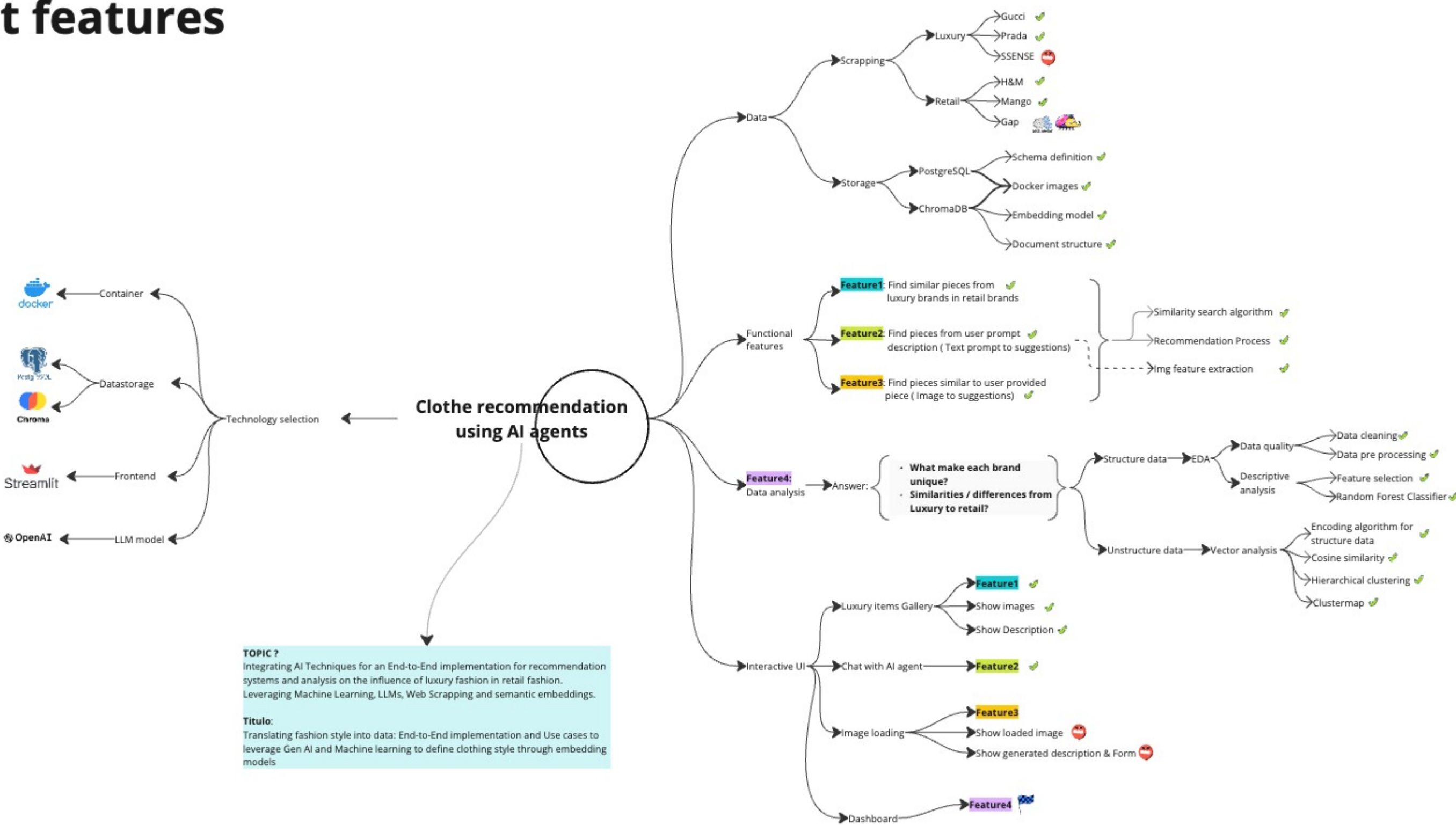


## Find pieces similar to user provided piece ( Image to suggestions)





# Project features

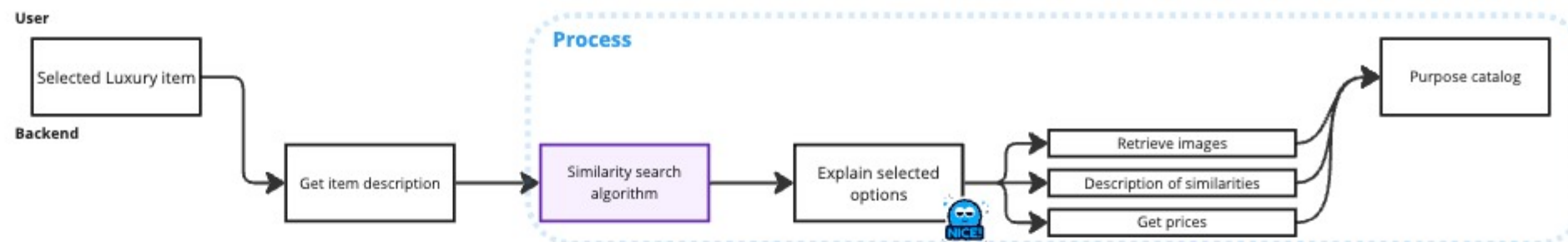


# Project features

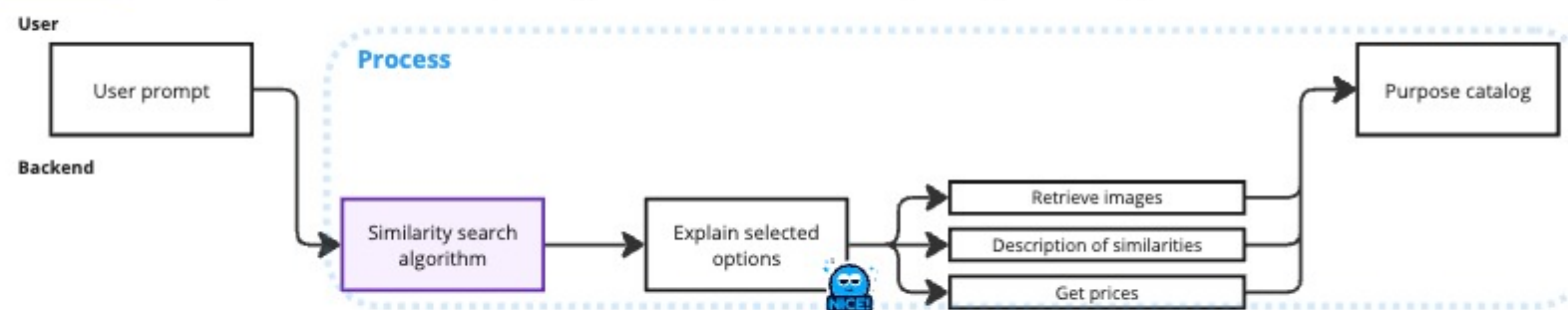
Clothe recommendation  
using AL agents

Functional  
features

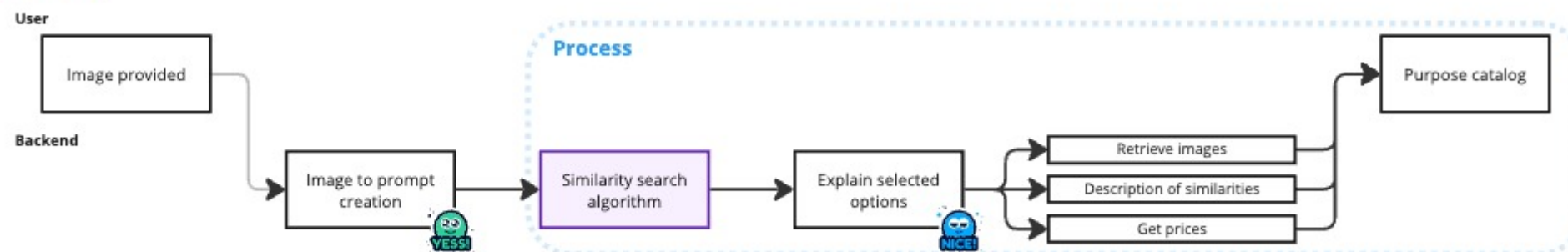
**Feature1:** Find similar pieces from luxury brands in retail brands



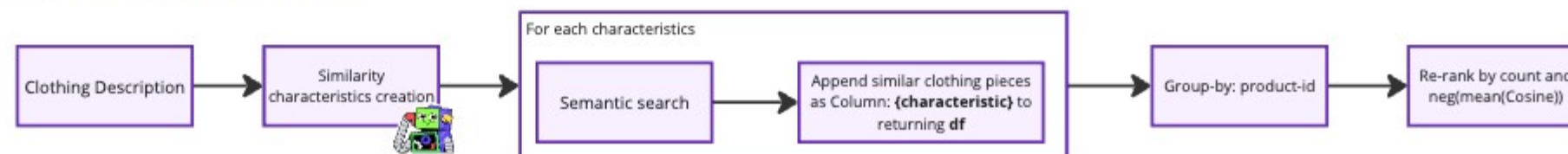
**Feature2:** Find pieces from user prompt description ( Text prompt to suggestions)



**Feature3:** Find pieces similar to user provided piece ( Image to suggestions)

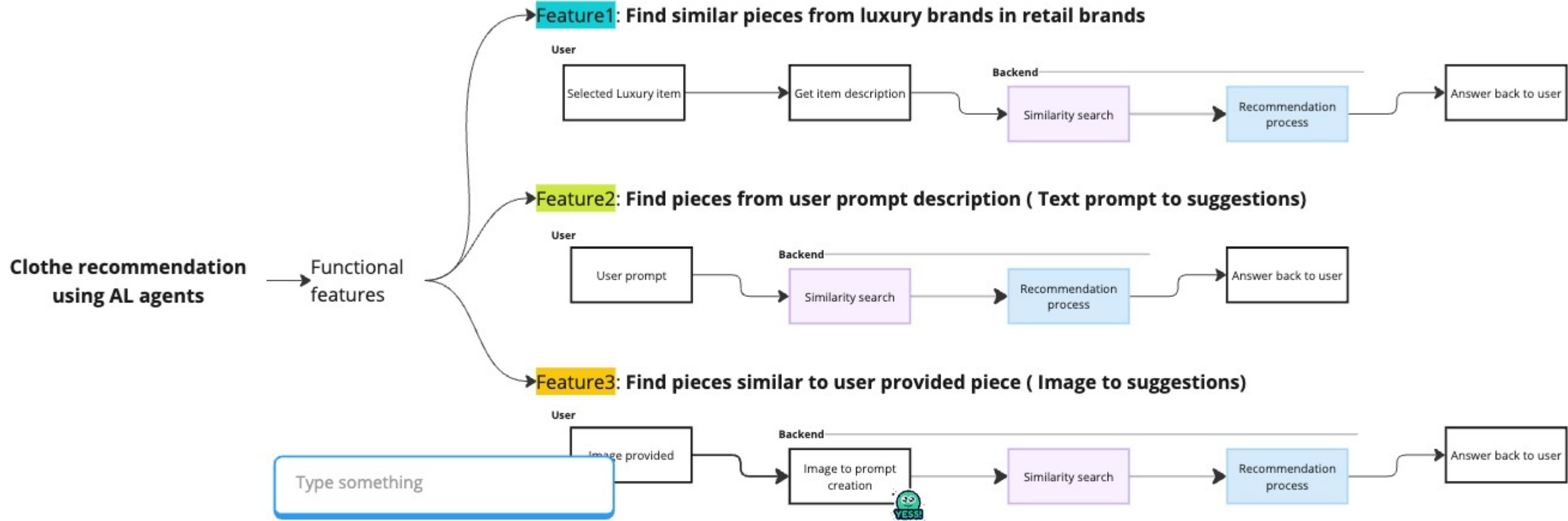


**Similarity search algorithm**

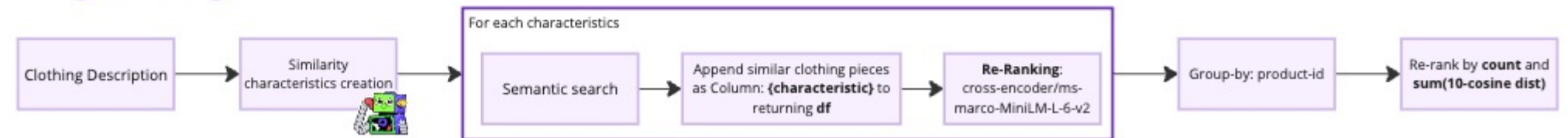




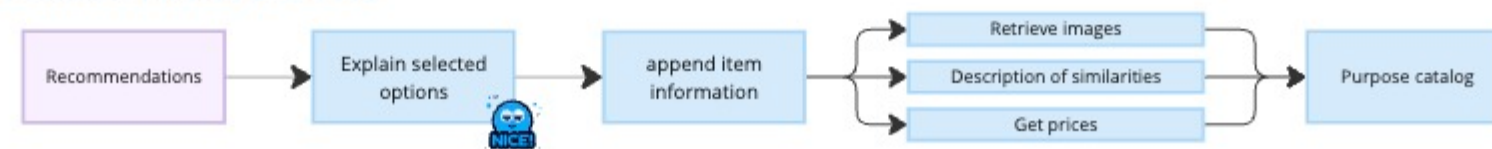
# Recommendation system features



## Similarity search algorithm

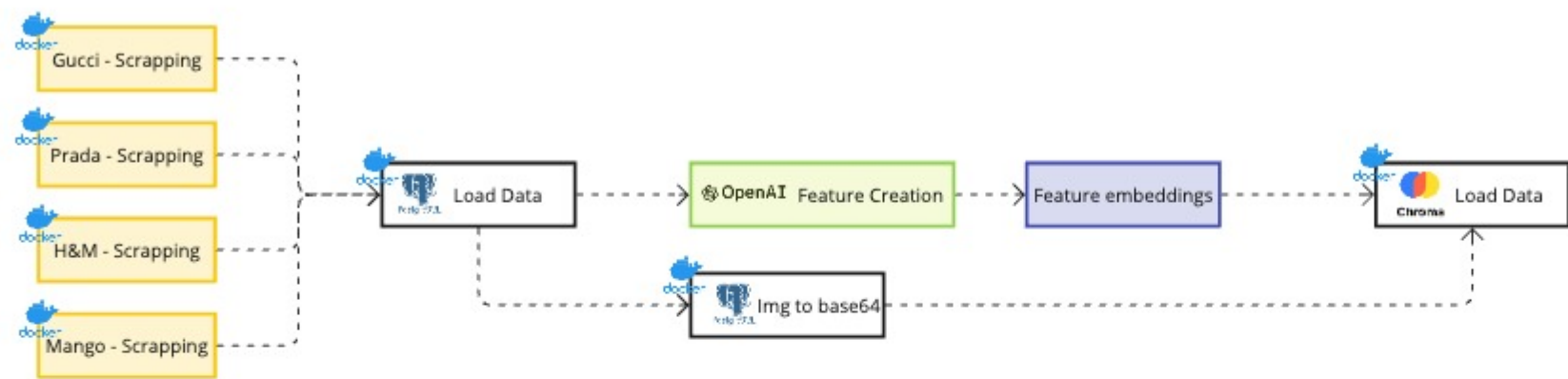


## Recommendation process



# Data Loading

## Pipeline:

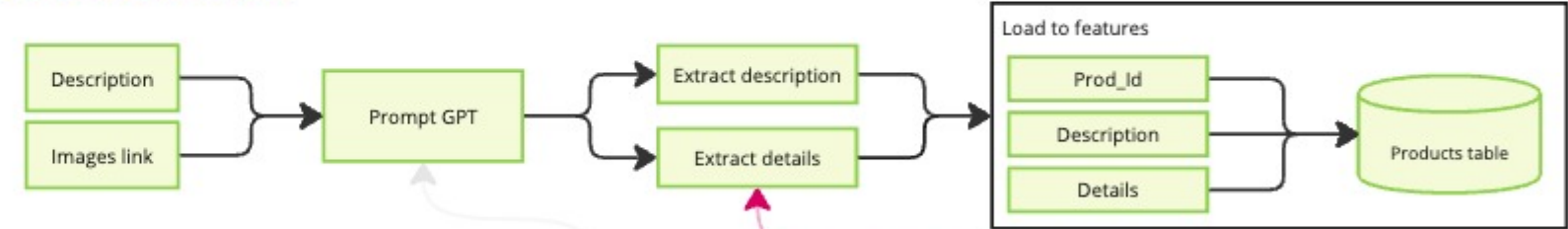


## Details:

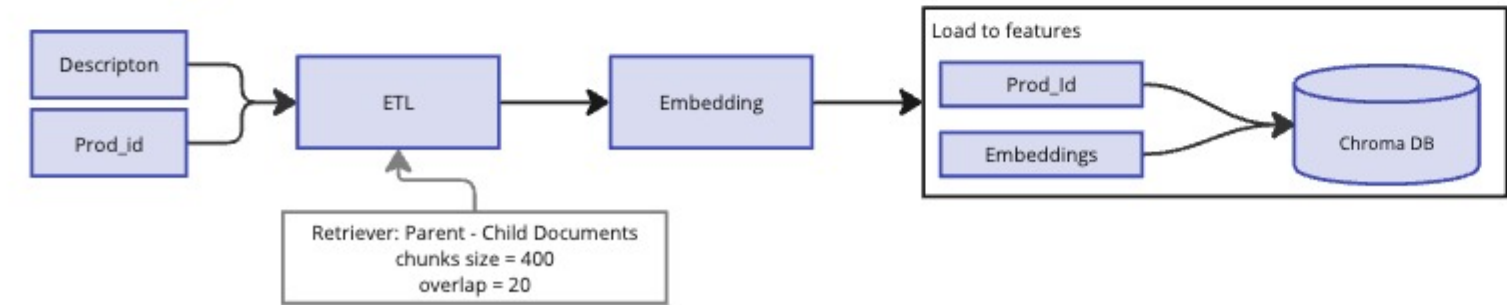
### Scrapping



### Feature creation



### Embeddings




use the following format to describe the image:  
Fit: (Description1, Description2, ..., DescriptionN)  
Sleeve type: (Description1, Description2, ..., DescriptionN)  
Collar type: (Description1, Description2, ..., DescriptionN)  
Patterns: (Description1, Description2, ..., DescriptionN)  
Material: (Description1, Description2, ..., DescriptionN)  
Formality: (Description1, Description2, ..., DescriptionN)

Here is the description based on the provided image:

- Fit: Loose, relaxed
- Sleeve type: Long sleeves, buttoned cuffs
- Collar type: Classic pointed collar
- Patterns: Pink floral embroidery, asymmetrical design
- Material: Cotton
- Formality: Semi-formal, casual


# Clothing Gallery



Luxury

Price: 650.0


Select



Luxury

Price: 1300.0


Select



Luxury

Price: 1100.0


Select



Luxury


Price: 980.0

Select




Luxury

Price: 850.0




Luxury

Price: 1400.0



Luxury

Price: 790.0



Luxury

Price: 850.0


Selected Item:



Brand: Luxury

Summary: The showcased top from Gucci is a floral lace blouse named "Top in pizzo floreale con Doppia G," inspired by the summer spirit and beach clubs. It features a fitted silhouette with a sleeveless design, making it ideal for warm weather. The neckline is a high, rounded style, which adds a touch of elegance. The material is a delicate floral lace that is slightly transparent, enhancing its airy and breathable quality. The predominant color is a deep navy blue, referred to as "Blu Scuro," which is complemented by intricate lace patterns that add texture and depth. The Double G embellishment, a signature Gucci detail, is subtly placed on the front, adding a luxurious touch. The top does not have a collar or pockets, maintaining a streamlined and sophisticated look. The fabric is lightweight and fluid, ensuring comfort and ease of movement. This top is suitable for semi-formal occasions, summer outings, or stylish beach gatherings, thanks to its chic design and breathable material.


Recommendations:




Brand: Retail

Price: 25.99

Reccomendation: This piece features a similar floral lace design and fitted silhouette, making it ideal for warm weather events, while also incorporating a sophisticated neckline that enhances its elegance.







Brand: Retail

Price: 39.99

Reccomendation: With a lightweight and breathable fabric, this blouse mirrors the airy quality of your Gucci top and includes intricate lace patterns, perfect for summer outings and semi-formal occasions.







Brand: I Retail

Price: 29.99

Reccomendation: This top shares the sleeveless design and luxurious lace texture, offering a chic and stylish look suitable for beach gatherings, much like your floral lace blouse.







Brand: Retail

Price: 39.99

Reccomendation: Featuring a high neckline and delicate lace details, this piece captures the essence of elegance and comfort, making it a great match for warm weather and semi-formal settings.






Brand: Retail

Price: 25.99

Reccomendation: This blouse combines a fitted silhouette with floral lace elements, similar to your Gucci top, ensuring a breathable and stylish option for summer events, while maintaining a sophisticated appearance.





# EDA

To maximize the use of all characteristics and ensure the GPT model can interpret the data effectively when implemented as a service.

0s

Detail \

0 \*Type: Shirt \n\*Fit: Regular fit \n\*Sleeve s...

1 \*Type: Shirt \n\*Fit: Regular fit \n\*Sleeve s...

2 \*Type: Shirt \n\*Fit: Regular fit \n\*Sleeve s...

3 \*Type: Top\n\*Fit: Regular fit\n\*Sleeve style: ...

4 \*Type: Shirt \n\*Fit: Regular fit \n\*Sleeve s...

Summary Brand Price \

0 The shirt depicted in the images is a Gucci Ox...

1 The showcased shirt is a luxurious Gucci creat...

2 The shirt showcased in the images is a Gucci p...

3 The showcased top from Gucci is a floral lace ...

4 The Gucci cotton poplin shirt, inspired by sum...

Brand

Price

Gucci

650.0

Gucci

1300.0

Gucci

1100.0

Gucci

980.0

Gucci

850.0

Link

0 <https://www.gucci.com/it/it/pr/women/ready-to-...>

1 <https://www.gucci.com/it/it/pr/women/ready-to-...>

2 <https://www.gucci.com/it/it/pr/women/ready-to-...>

3 <https://www.gucci.com/it/it/pr/women/ready-to-...>

4 <https://www.gucci.com/it/it/pr/women/ready-to-...>

1 to 8 of 8 entries

Filter

?

index	Unnamed: 0	id	Brand_id	Price
count	154.0	154.0	154.0	154.0
mean	76.5	77.5	77.5	502.53922077922067
std	44.60007473835292	44.60007473835292	44.60007473835292	666.3036071835377
min	0.0	1.0	1.0	5.99
25%	38.25	39.25	39.25	29.99
50%	76.5	77.5	77.5	39.99
75%	114.75	115.75	115.75	980.0
max	153.0	154.0	154.0	2500.0

Show

25

per page

il.

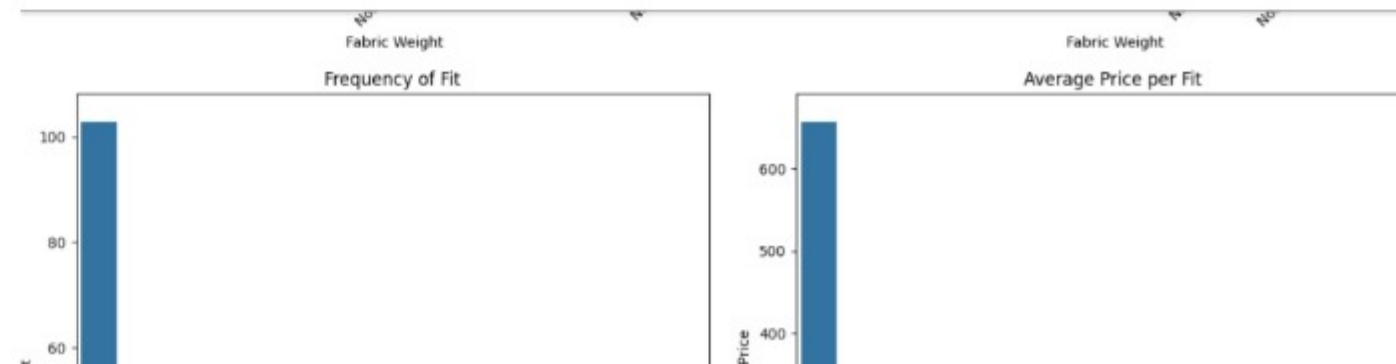
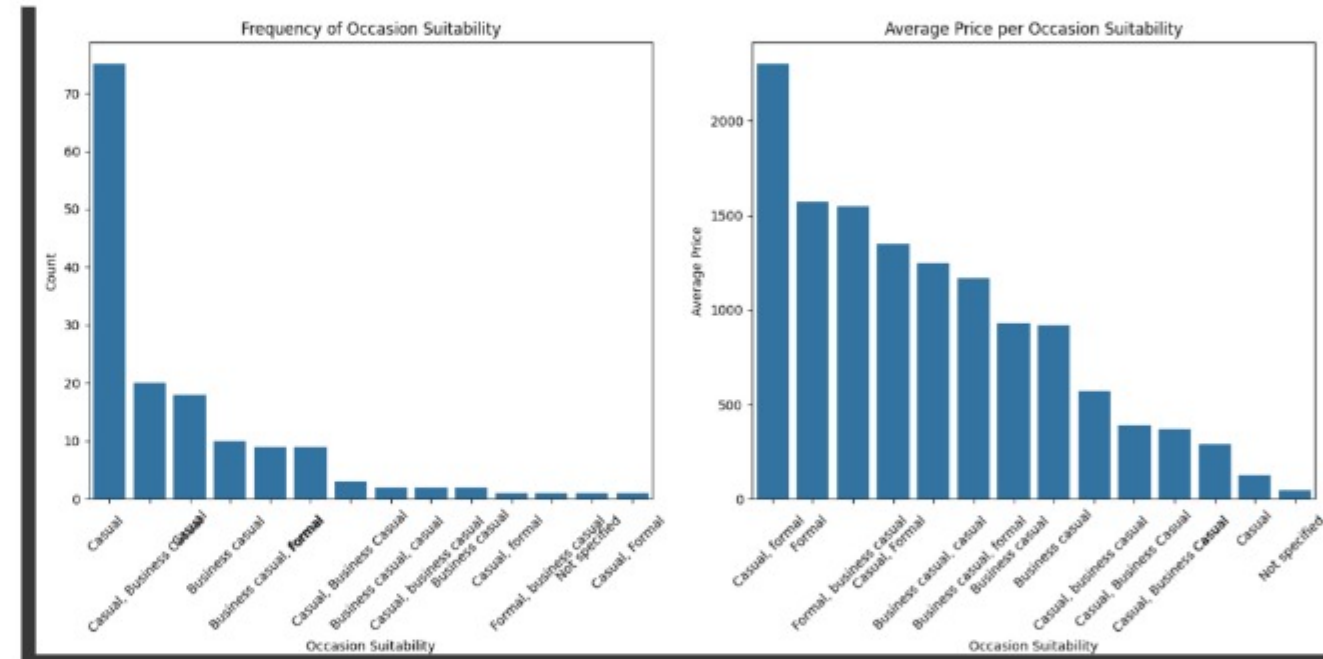
***characterstics importance***

```

→ Feature Importances:
      Feature      Importance
23      type      0.287784
10     material    0.206464
13     patterns    0.086180
7      formality   0.072294
14     patterns_placement 0.058960
2      colors      0.051973
1      collar_style 0.049909
12     occasion_suitability 0.037602
11     neckline    0.031234
3      details_and_embellishments 0.029694
18     season      0.022390
20     sleeve_style 0.013263
6      fluidity_of_fabric 0.010632
22     transparency 0.010171
19     shape       0.009442
5      fit         0.006761
9      length      0.005404
0      breathability 0.004456
16     pocket_presence 0.003317
4      fabric_weight 0.001543
21     texture     0.000525
8      lapel       0.000002
15     pocket_placement 0.000000
17     pocket_size 0.000000

```

## ***The distribution and average price for each characteristic***





Ask me anything about luxury brands:

Elegant and summery vibe. With relaxed fit with long sleeves and buttoned cuffs.

Search

Retail

Product ID: 120

Explanation: With a regular fit and fluid fabric, this shi...

Brand: Retail

Price: 39.99



Product ID: 136

Explanat Retail ; straight-fit shirt combines a regular fi...

Brand: Retail

Price: 39.99

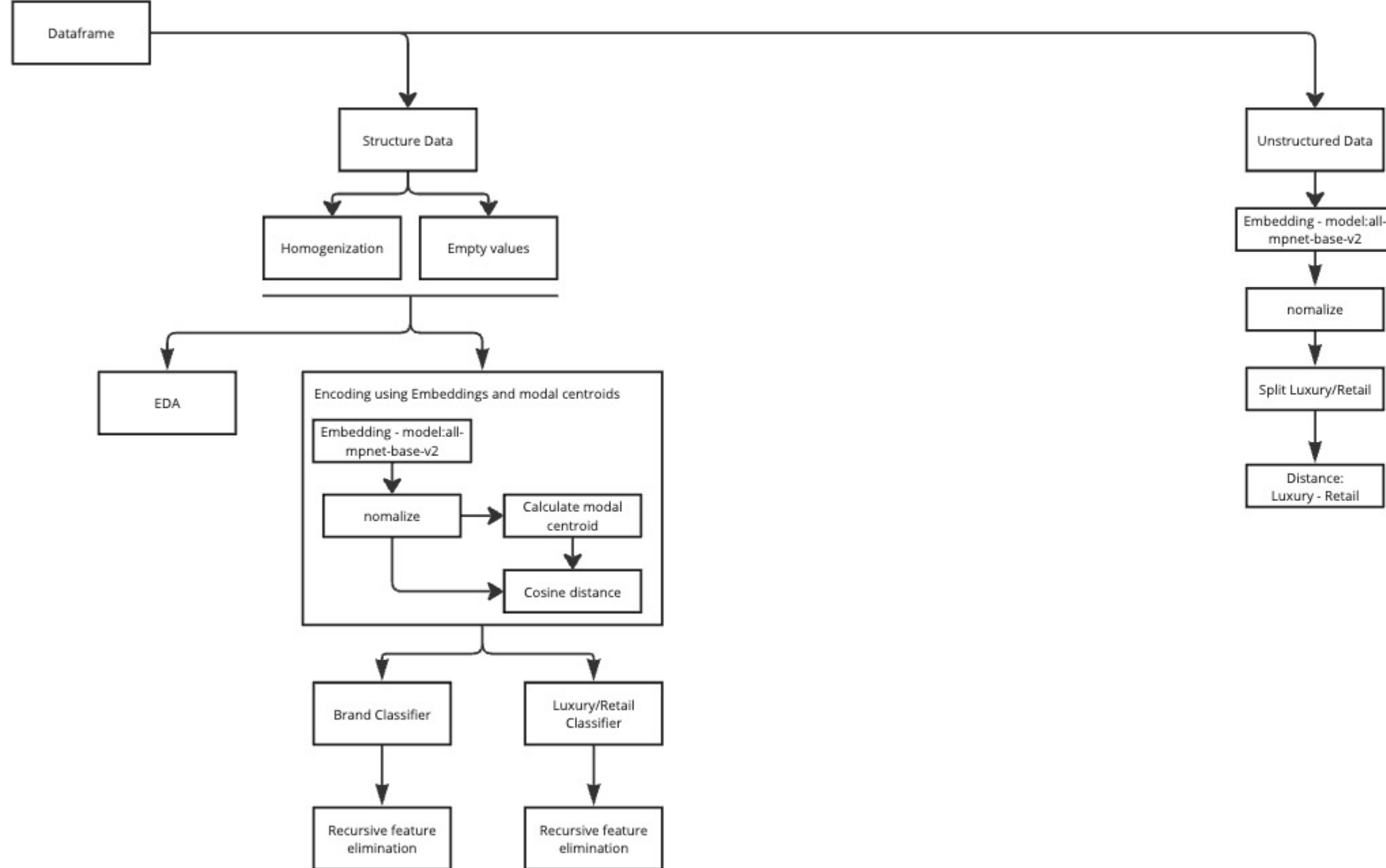


Product ID: 154

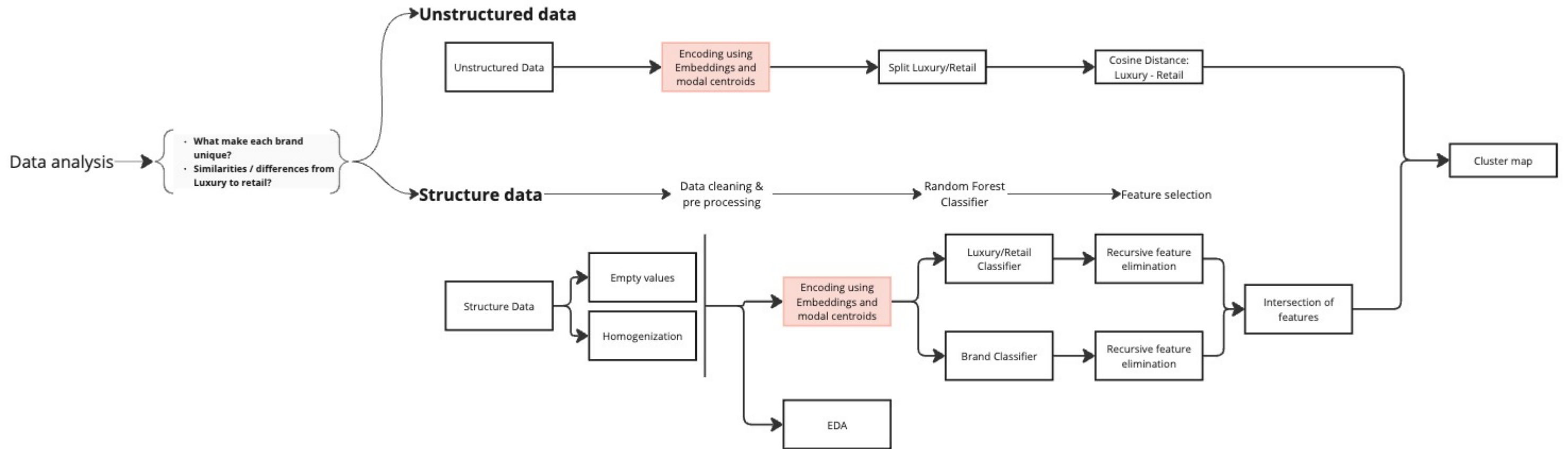
Explanation: This loose-fit top showcases a fluid fabric s...



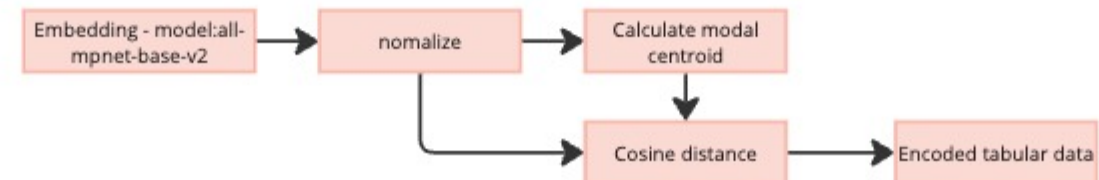
# Data Transformations



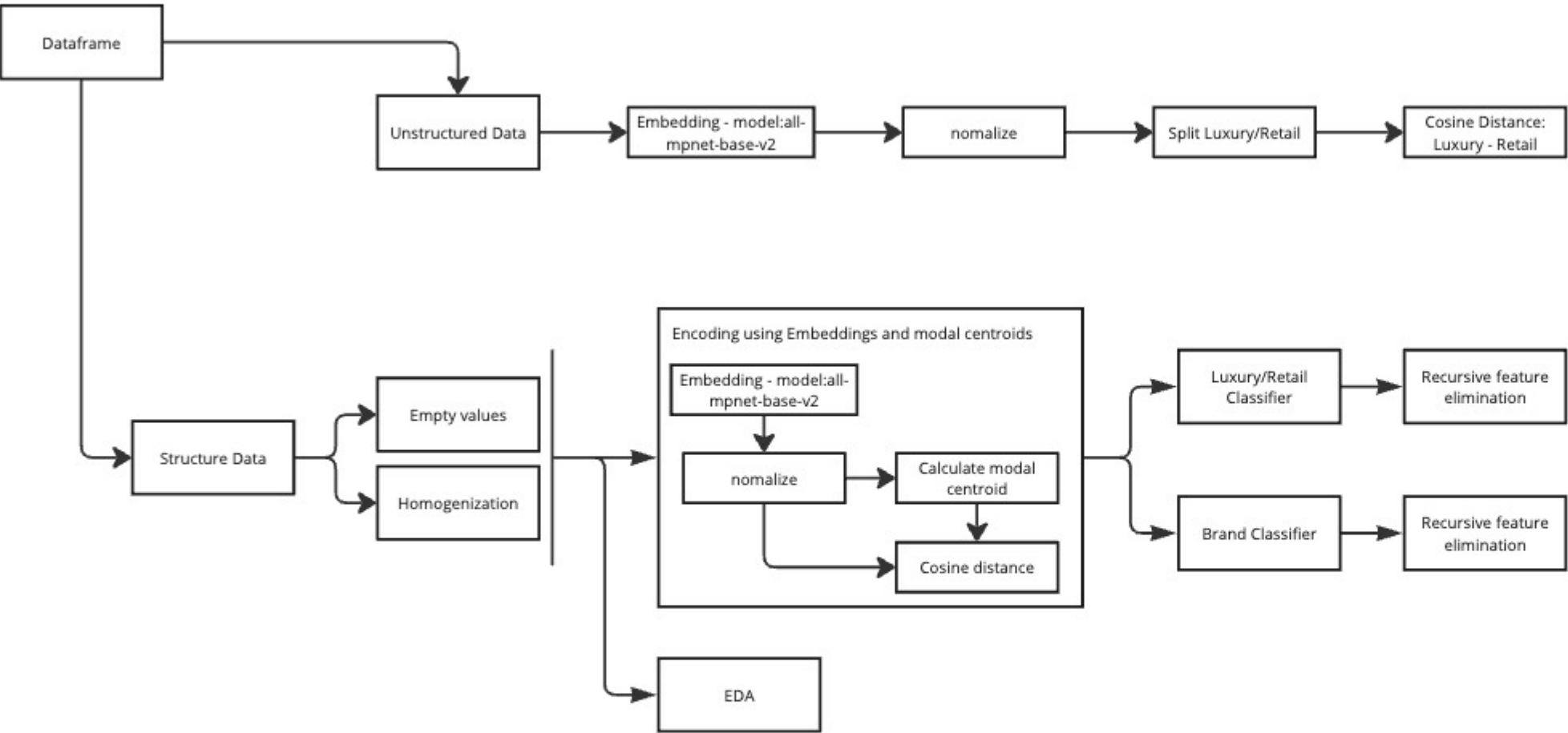
# Data Transformations



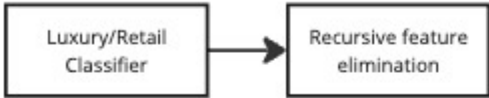
## Encoding using Embeddings and modal centroids



# Data Transformations

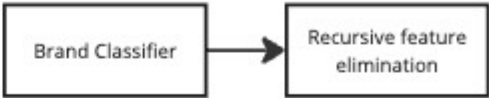


# Random Forest Classifier and Feature selection



	precision	recall	f1-score	support
0	0.91	0.95	0.93	22
1	0.88	0.78	0.82	9
accuracy			0.90	31
macro avg	0.89	0.87	0.88	31
weighted avg	0.90	0.90	0.90	31

	precision	recall	f1-score	support
0	0.95	0.95	0.95	22
1	0.89	0.89	0.89	9
accuracy			0.94	31
macro avg	0.92	0.92	0.92	31
weighted avg	0.94	0.94	0.94	31

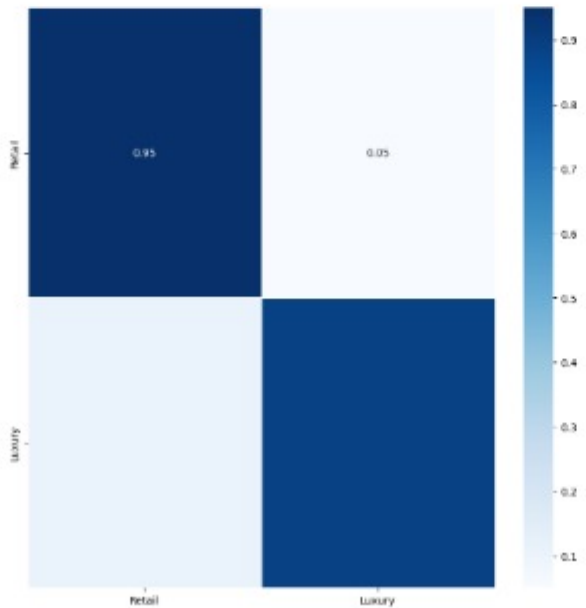


Classification Report:				
	precision	recall	f1-score	support
1	0.60	0.60	0.60	5
2	1.00	0.50	0.67	4
3	0.75	0.50	0.60	6
4	0.70	0.88	0.78	16
accuracy			0.71	31
macro avg	0.76	0.62	0.66	31
weighted avg	0.73	0.71	0.70	31

Classification Report:				
	precision	recall	f1-score	support
1	0.80	0.80	0.80	5
2	0.75	0.75	0.75	4
3	0.75	0.50	0.60	6
4	0.78	0.88	0.82	16
accuracy			0.77	31
macro avg	0.77	0.73	0.74	31
weighted avg	0.77	0.77	0.77	31

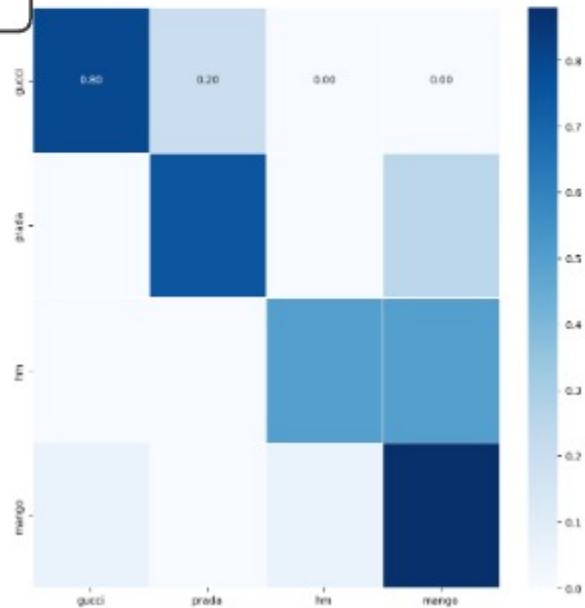
	Feature	Importance
10	neckline	0.171158
12	patterns	0.125399
9	material	0.100414
7	formality	0.097039
11	occasion_suitability	0.068921
2	colors	0.067145
18	type	0.061281
3	details_and_embellishments	0.058598
15	sleeve_style	0.042887
5	fit	0.039023
14	shape	0.036226
1	collar_style	0.031492
6	fluidity_of_fabric	0.025543
13	pocket_presence	0.019690
17	transparency	0.015196
19	pockets	0.013820
4	fabric_weight	0.008613
0	breathability	0.007722
8	length	0.007096
16	texture	0.002739

	Feature	Importance
2	neckline	0.325921
3	patterns	0.245219
0	formality	0.223547
1	material	0.205313



	Feature	Importance
9	material	0.120545
10	neckline	0.112104
2	colors	0.111265
12	patterns	0.095882
15	sleeve_style	0.060296
7	formality	0.056589
3	details_and_embellishments	0.054951
11	occasion_suitability	0.047067
5	fit	0.044797
18	type	0.043697
14	shape	0.042813
19	pockets	0.037680
1	collar_style	0.037670
13	pocket_presence	0.037589
6	fluidity_of_fabric	0.034248
4	fabric_weight	0.015976
0	breathability	0.015241
17	transparency	0.014005
8	length	0.013434
16	texture	0.004153

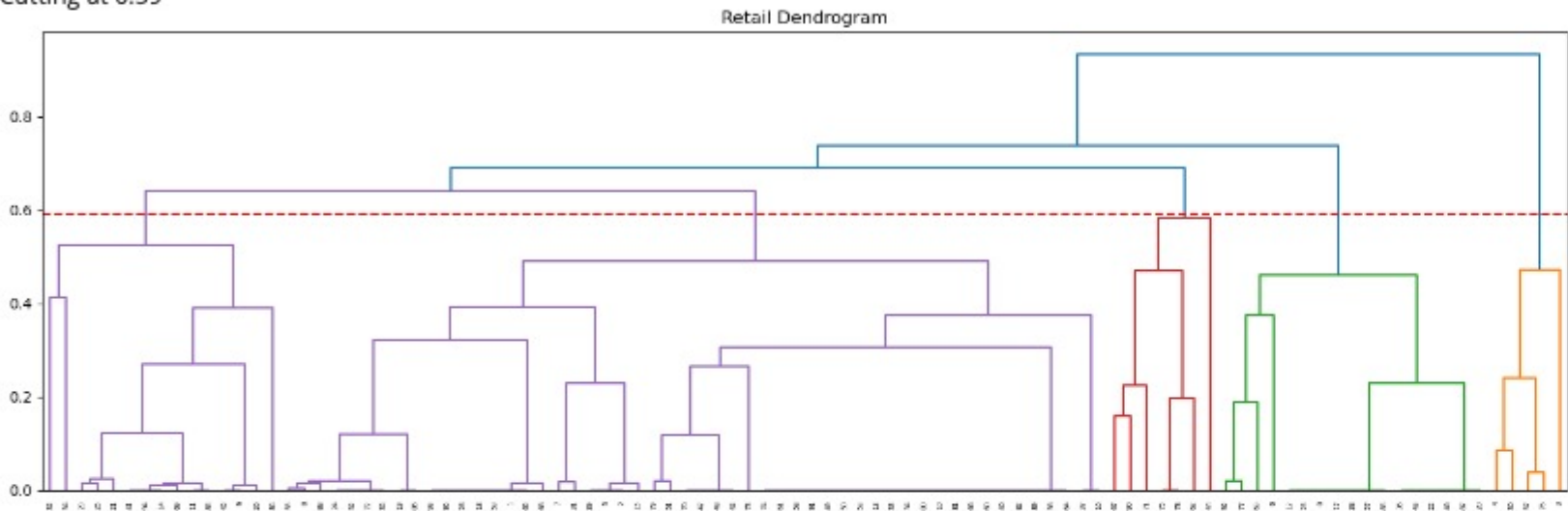
Feature Importances:		
	Feature	Importance
1	material	0.295627
2	neckline	0.246194
0	colors	0.191950
3	patterns	0.174954
4	sleeve_style	0.091275



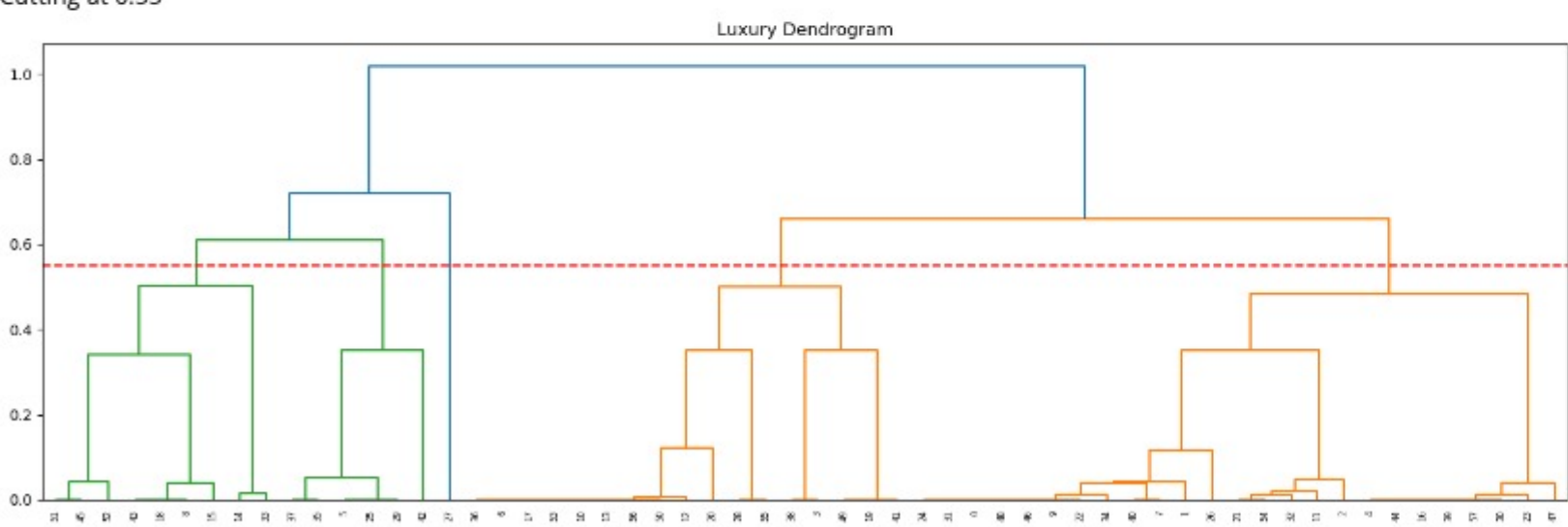


# Data Transformations

Cutting at 0.59

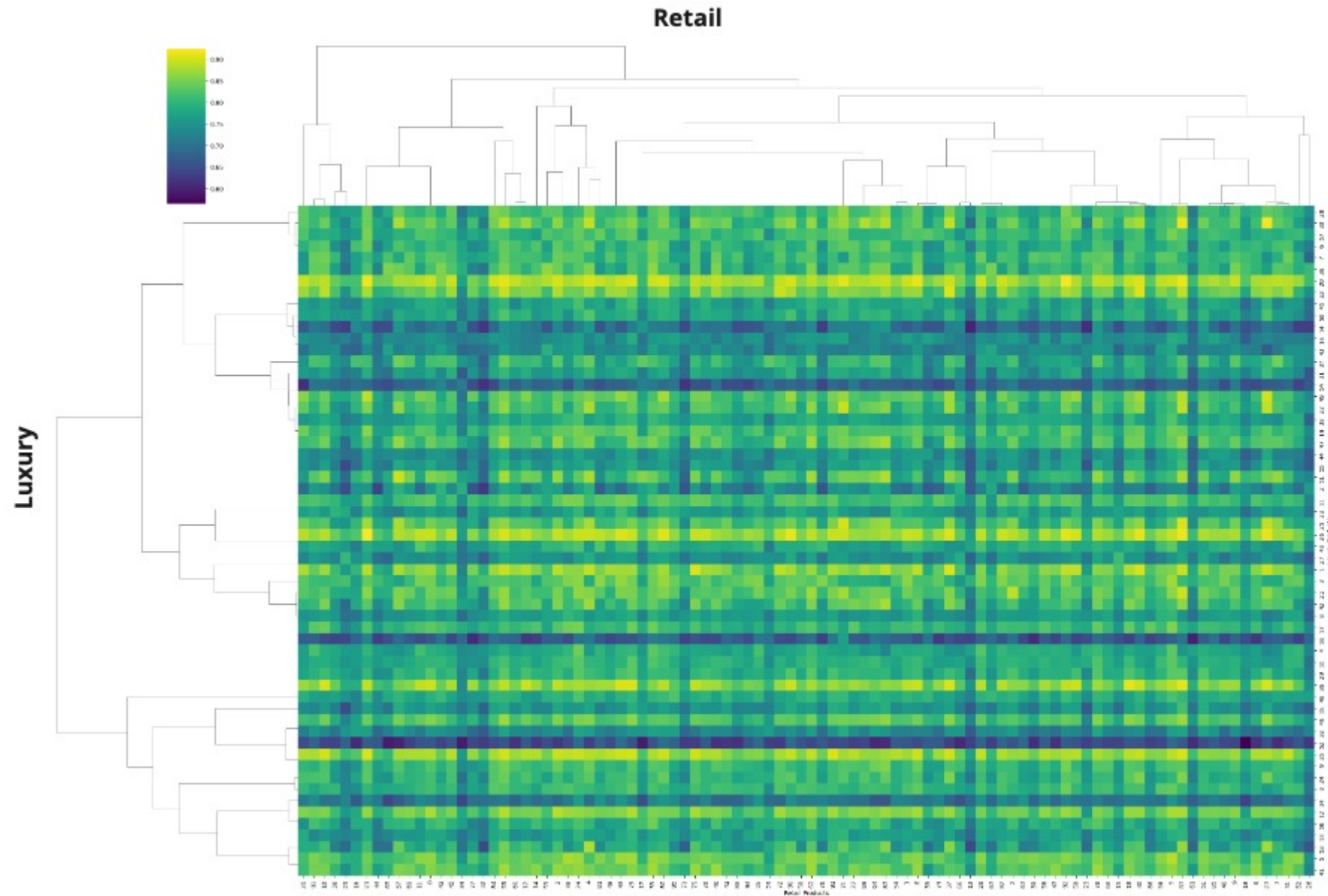


Cutting at 0.55



**EXPLAIN CLUSTERS**

# Data Transformations

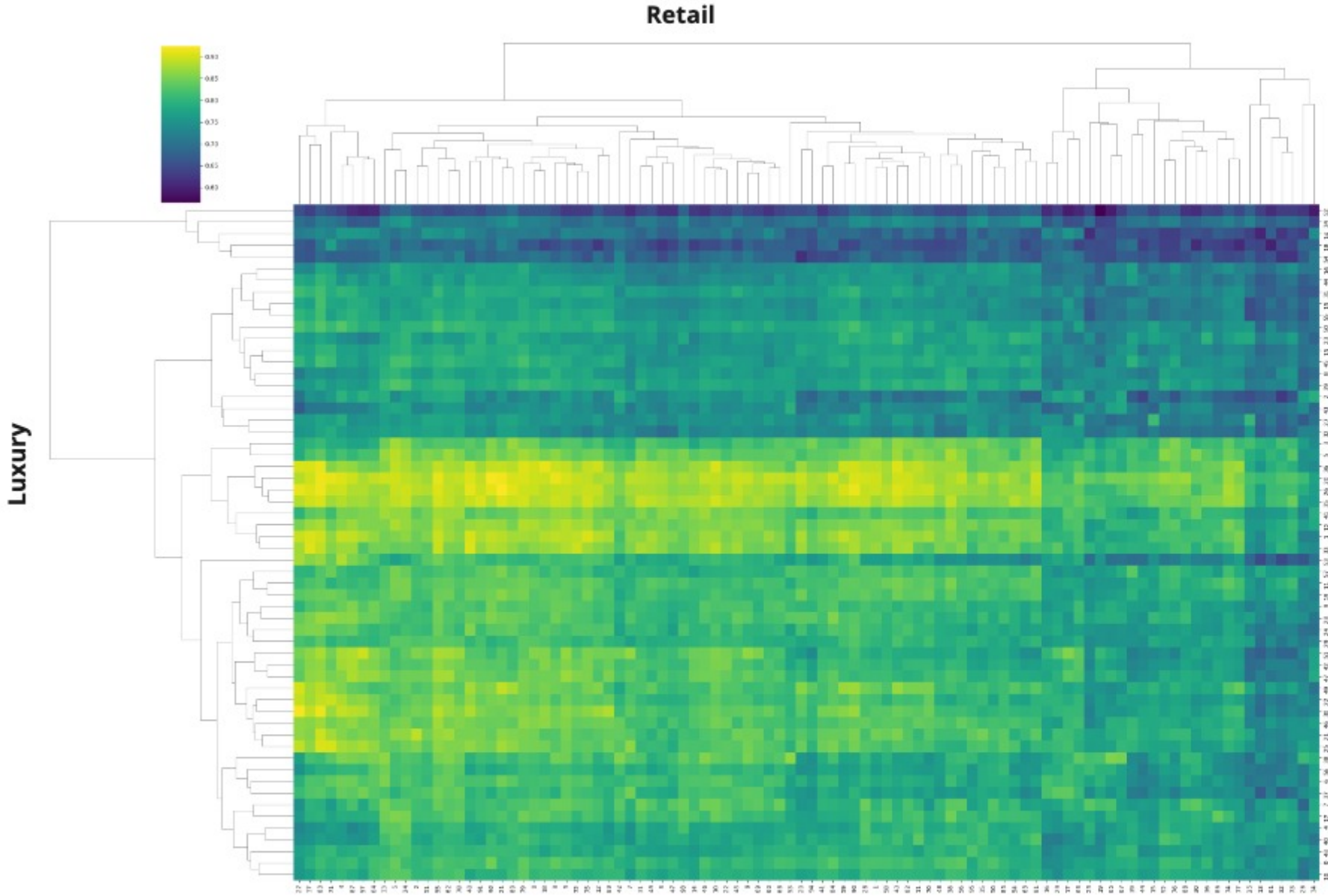


Heatmap with Hierarchical clustering linkage

## EXPLAIN:

What are the main copied and the main uniques

# Data Transformations

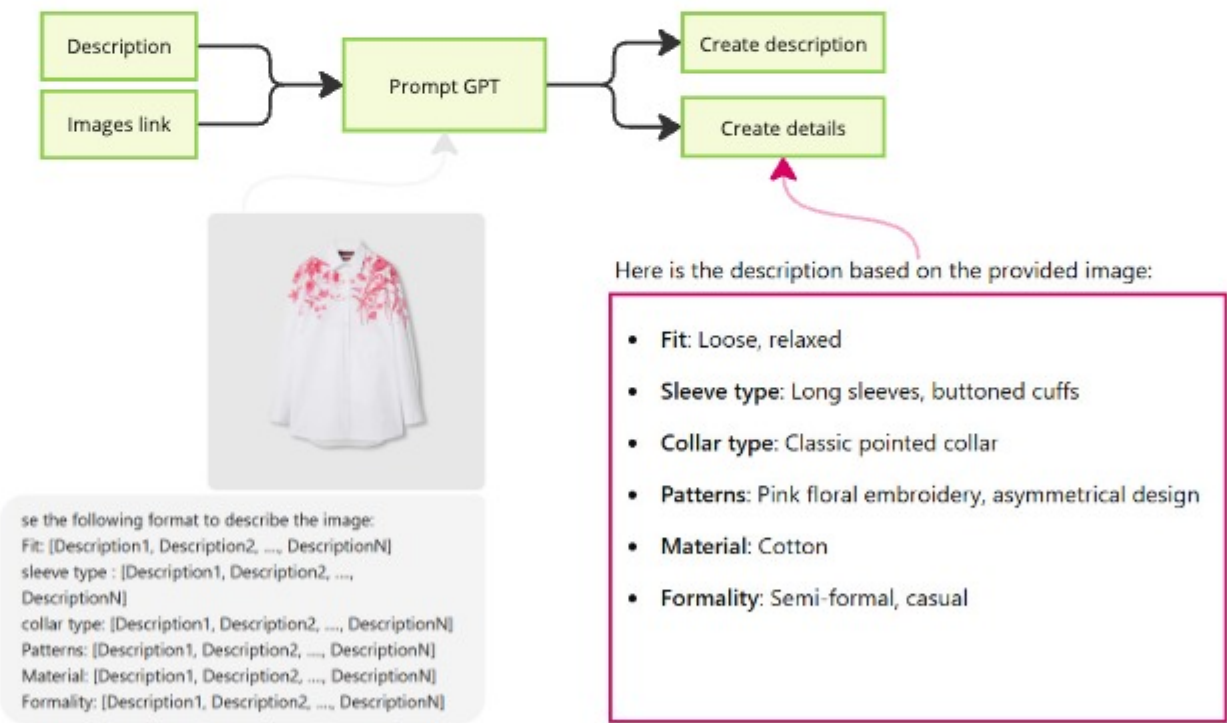
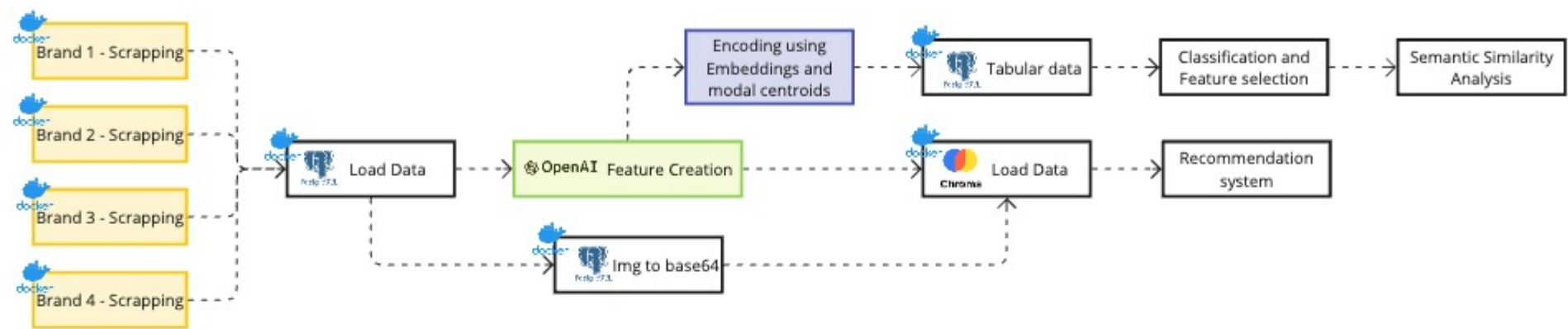


Heatmap without the hierarchical clustering sorting

**EXPLAIN:**  
What are the main copied and the main uniques

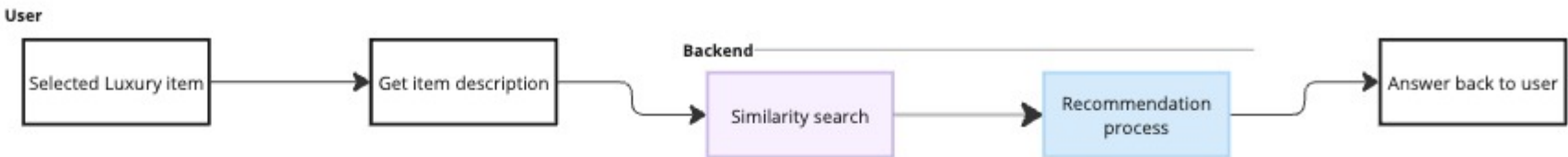
# Data Loading

## Pipeline:





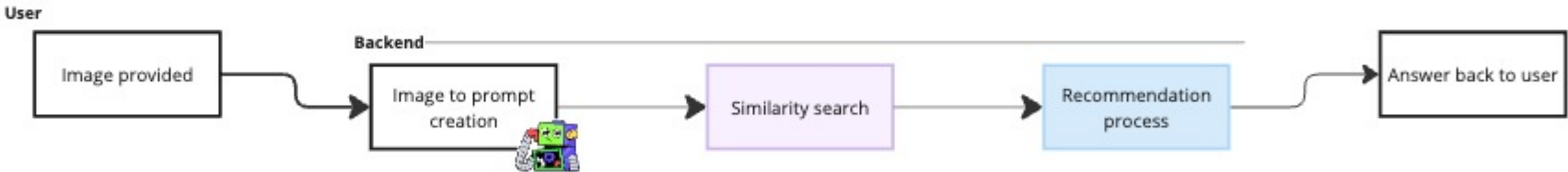
Find similar pieces from luxury brands in retail brands



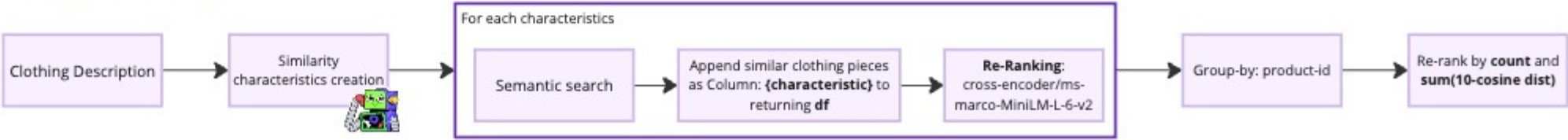
Find pieces from user prompt description ( Text prompt to suggestions)



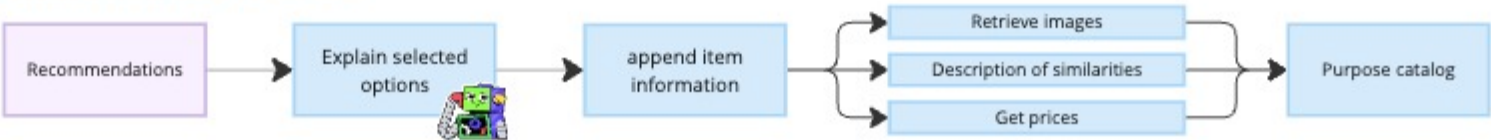
Find pieces similar to user provided piece ( Image to suggestions)



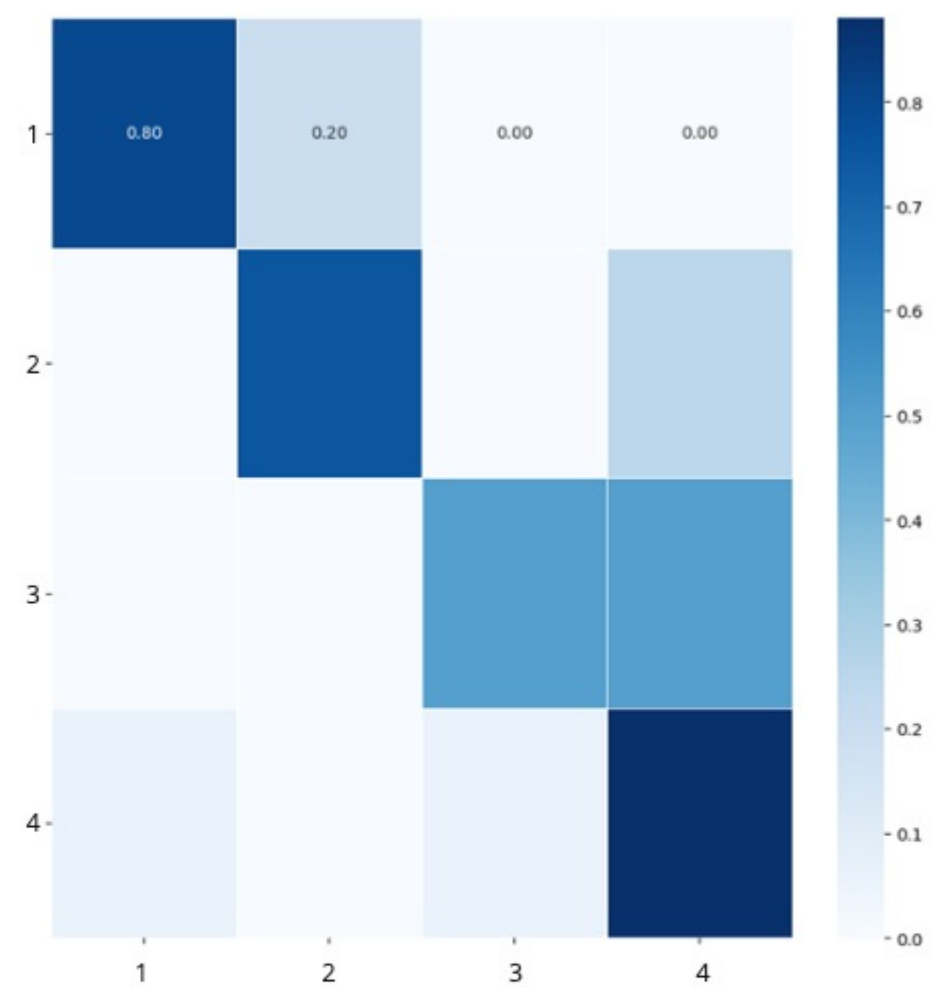
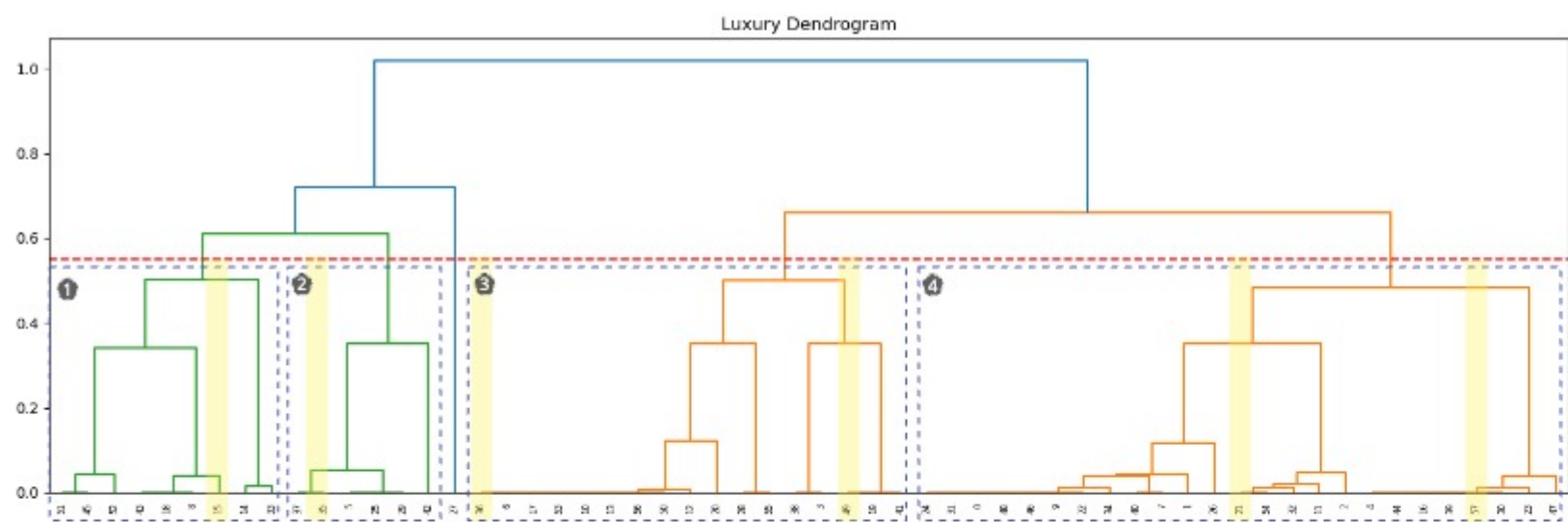
Similarity search algorithm



Recommendation process









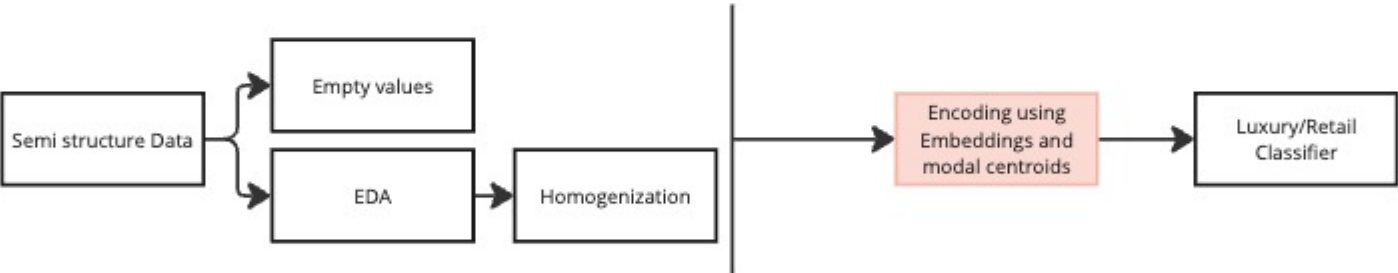
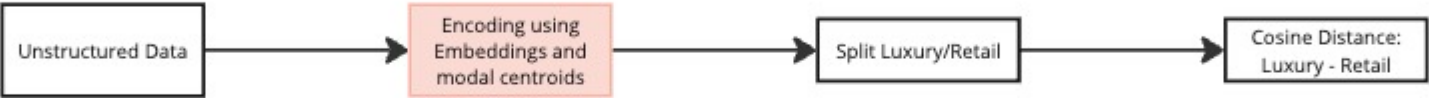
Luxury		Similarity		Retail	
<div>Prod 20</div> 	Most	<div>Prod 21</div> 	<b>Cosine similarity:</b> 91%  <b>Features</b> neckline: not applicable patterns: true formality: casual material: cotton colors: multicolor	<div>Prod 45</div> 	<b>Cosine similarity:</b> 89%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: polyester colors: white
neckline: not applicable patterns: true formality: formal material: silk colors: multicolor	Least	<div>Prod 34</div> 	<b>Cosine similarity:</b> 77%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: cotton colors: multicolor	<div>Prod 32</div> 	<b>Cosine similarity:</b> 82%  <b>Features</b> neckline: crew neck patterns: true formality: casual material: cotton colors: brown
<div>Prod 35</div> 	Most	<div>Prod 10</div> 	<b>Cosine similarity:</b> 89%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: cotton colors: white	<div>Prod 91</div> 	<b>Cosine similarity:</b> 90%  <b>Features</b> neckline: crew neck patterns: true formality: casual material: not specified colors: white
neckline: not applicable patterns: true formality: business casual material: cotton colors: white	Least	<div>Prod 26</div> 	<b>Cosine similarity:</b> 76%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: polyester colors: black	<div>Prod 61</div> 	<b>Cosine similarity:</b> 81%  <b>Features</b> neckline: not applicable patterns: true formality: business casual material: not specified colors: white
<div>Prod 19</div> 	Most	<div>Prod 43</div> 	<b>Cosine similarity:</b> 84%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: cotton colors: white	<div>Prod 91</div> 	<b>Cosine similarity:</b> 83%  <b>Features</b> neckline: crew neck patterns: true formality: casual material: not specified colors: white
neckline: not applicable patterns: true formality: business casual material: cotton colors: blue	Least	<div>Prod 26</div> 	<b>Cosine similarity:</b> 73%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: polyester colors: black	<div>Prod 88</div> 	<b>Cosine similarity:</b> 78%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: Polyester colors: Black
<div>Prod 36</div> 	Most	<div>Prod 27</div> 	<b>Cosine similarity:</b> 90%  <b>Features</b> neckline: V-neck patterns: true formality: business casual material: Polyester colors: brown	<div>Prod 83</div> 	<b>Cosine similarity:</b> 91%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: Polyester colors: Blue
neckline: not applicable patterns: true formality: business casual material: cotton colors: white	Least	<div>Prod 26</div> 	<b>Cosine similarity:</b> 74%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: polyester colors: black	<div>Prod 67</div> 	<b>Cosine similarity:</b> 78%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: Polyester colors: Brown
<div>Prod 35</div> 	Most	<div>Prod 5</div> 	<b>Cosine similarity:</b> 84%  <b>Features</b> neckline: not applicable patterns: true formality: casual material: not specified colors: white	<div>Prod 83</div> 	<b>Cosine similarity:</b> 82%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: polyester colors: blue
neckline: not applicable patterns: true formality: formal material: silk colors: multicolor	Least	<div>Prod 68</div> 	<b>Cosine similarity:</b> 79%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: polyester colors: white	<div>Prod 34</div> 	<b>Cosine similarity:</b> 75%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: cotton colors: multicolor
		<div>Prod 75</div> 	<b>Cosine similarity:</b> 89%  <b>Features</b> neckline: crew neck patterns: true formality: casual material: cotton colors: white	<div>Prod 17</div> 	<b>Cosine similarity:</b> 80%  <b>Features</b> neckline: crew neck patterns: true formality: casual material: cotton colors: black
		<div>Prod 13</div> 	<b>Cosine similarity:</b> 77%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: cotton colors: brown	<div>Prod 75</div> 	<b>Cosine similarity:</b> 84%  <b>Features</b> neckline: crew neck patterns: true formality: casual material: cotton colors: white
		<div>Prod 13</div> 	<b>Cosine similarity:</b> 74%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: cotton colors: brown	<div>Prod 43</div> 	<b>Cosine similarity:</b> 90%  <b>Features</b> neckline: crew neck patterns: true formality: casual material: not specified colors: white
		<div>Prod 13</div> 	<b>Cosine similarity:</b> 75%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: cotton colors: brown	<div>Prod 83</div> 	<b>Cosine similarity:</b> 81%  <b>Features</b> neckline: crew neck patterns: true formality: casual material: cotton colors: white
		<div>Prod 14</div> 	<b>Cosine similarity:</b> 76%  <b>Features</b> neckline: button-down patterns: true formality: casual material: cotton colors: multicolor	<div>Prod 34</div> 	<b>Cosine similarity:</b> 75%  <b>Features</b> neckline: V-neck patterns: true formality: casual material: cotton colors: multicolor



# Data Transformations

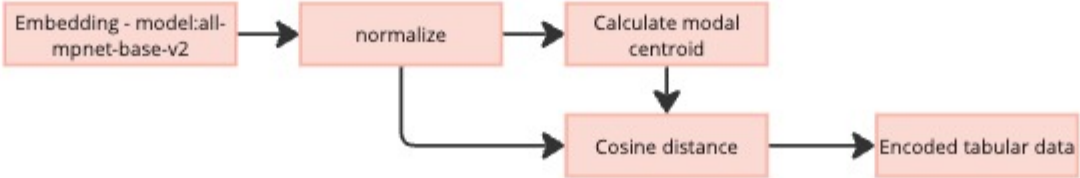
Data analysis → {  
• What make each brand unique?  
• Similarities / differences from Luxury to retail?  
}





























## Unstructured data



Cluster map

## Encoding using Embeddings and modal centroids



Luxury		Most similar				Least similar		
<div>Prod 20</div> <div></div> <div><b>Features</b> neckline: not applicable patterns: true formality: formal material: silk colors: multicolor</div>	<div>Prod 21</div> <div></div> <div><b>Cosine similarity:</b> 91% <b>Features</b> neckline: not applicable patterns: true formality: casual material: cotton colors: multicolor</div>	<div>Prod 45</div> <div></div> <div><b>Cosine similarity:</b> 89% <b>Features</b> neckline: V-neck patterns: true formality: casual material: polyester colors: white</div>	<div>Prod 55</div> <div></div> <div><b>Cosine similarity:</b> 91% <b>Features</b> neckline: V-neck patterns: true formality: casual material: polyester colors: white</div>	<div>Prod 34</div> <div></div> <div><b>Cosine similarity:</b> 77% <b>Features</b> neckline: V-neck patterns: true formality: casual material: cotton colors: multicolor</div>	<div>Prod 32</div> <div></div> <div><b>Cosine similarity:</b> 82% <b>Features</b> neckline: crew neck patterns: true formality: casual material: cotton colors: brown</div>	<div>Prod 17</div> <div></div> <div><b>Cosine similarity:</b> 80% <b>Features</b> neckline: crew neck patterns: true formality: casual material: cotton colors: black</div>		
<div>Prod 35</div> <div></div> <div><b>Features</b> neckline: not applicable patterns: true formality: business casual material: cotton colors: white</div>	<div>Prod 10</div> <div></div> <div><b>Cosine similarity:</b> 89% <b>Features</b> neckline: V-neck patterns: true formality: casual material: cotton colors: white</div>	<div>Prod 91</div> <div></div> <div><b>Cosine similarity:</b> 90% <b>Features</b> neckline: crew neck patterns: true formality: casual material: not specified colors: white</div>	<div>Prod 75</div> <div></div> <div><b>Cosine similarity:</b> 89% <b>Features</b> neckline: crew neck patterns: true formality: casual material: cotton colors: white</div>	<div>Prod 26</div> <div></div> <div><b>Cosine similarity:</b> 76% <b>Features</b> neckline: V-neck patterns: true formality: casual material: polyester colors: black</div>	<div>Prod 61</div> <div></div> <div><b>Cosine similarity:</b> 81% <b>Features</b> neckline: not applicable patterns: true formality: business casual material: not specified colors: white</div>	<div>Prod 13</div> <div></div> <div><b>Cosine similarity:</b> 77% <b>Features</b> neckline: V-neck patterns: true formality: casual material: cotton colors: brown</div>		
<div>Prod 19</div> <div></div> <div><b>Features</b> neckline: not applicable patterns: true formality: business casual material: cotton colors: blue</div>	<div>Prod 43</div> <div></div> <div><b>Cosine similarity:</b> 84% <b>Features</b> neckline: V-neck patterns: true formality: casual material: cotton colors: white</div>	<div>Prod 91</div> <div></div> <div><b>Cosine similarity:</b> 83% <b>Features</b> neckline: crew neck patterns: true formality: casual material: not specified colors: white</div>	<div>Prod 75</div> <div></div> <div><b>Cosine similarity:</b> 84% <b>Features</b> neckline: crew neck patterns: true formality: casual material: cotton colors: white</div>	<div>Prod 26</div> <div></div> <div><b>Cosine similarity:</b> 73% <b>Features</b> neckline: V-neck patterns: true formality: casual material: polyester colors: black</div>	<div>Prod 88</div> <div></div> <div><b>Cosine similarity:</b> 78% <b>Features</b> neckline: V-neck patterns: true formality: casual material: Polyester colors: Black</div>	<div>Prod 13</div> <div></div> <div><b>Cosine similarity:</b> 74% <b>Features</b> neckline: V-neck patterns: true formality: casual material: cotton colors: brown</div>		
<div>Prod 35</div> <div></div> <div><b>Features</b> neckline: not applicable patterns: true formality: formal material: silk colors: multicolor</div>	<div>Prod 5</div> <div></div> <div><b>Cosine similarity:</b> 84% <b>Features</b> neckline: not applicable patterns: true formality: casual material: not specified colors: white</div>	<div>Prod 83</div> <div></div> <div><b>Cosine similarity:</b> 82% <b>Features</b> neckline: V-neck patterns: true formality: casual material: polyester colors: blue</div>	<div>Prod 75</div> <div></div> <div><b>Cosine similarity:</b> 81% <b>Features</b> neckline: crew neck patterns: true formality: casual material: cotton colors: white</div>	<div>Prod 68</div> <div></div> <div><b>Cosine similarity:</b> 79% <b>Features</b> neckline: V-neck patterns: true formality: casual material: polyester colors: white</div>	<div>Prod 34</div> <div></div> <div><b>Cosine similarity:</b> 75% <b>Features</b> neckline: V-neck patterns: true formality: casual material: cotton colors: multicolor</div>	<div>Prod 14</div> <div></div> <div><b>Cosine similarity:</b> 76% <b>Features</b> neckline: button-down patterns: true formality: casual material: cotton colors: multicolor</div>		

Most

Least

Ask me anything about luxury brands:

Elegant and summery vibe. With relaxed fit with long sleeves and buttoned cuffs.


Search

Product ID: 120

Explanation: With a regular fit and fluid fabric, this shi...

Brand: Retail

Price: 39.99




Product ID: 136

Explanati Retail : straight-fit shirt combines a regular fi...

Brand: Retail

Price: 39.99




Product ID: 154

Explanation: This loose-fit top showcases a fluid fabric s...

Brand: Retail

Price: 29.99





ucci

1.0



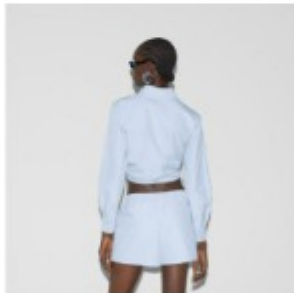
Luxury

Price: 980.0

Select



ucci



Gucci

Top 3 reccomendations



Brand: Retail

Price: 39.99

Recommendation: Featuring a high neckline and delicate lace details, this piece captures the essence of elegance and comfort, making it a great match for warm weather and semi-formal settings.



Brand: Retail

Price: 29.99

Recommendation: This top shares the sleeveless design and luxurious lace texture, offering a chic and stylish look suitable for beach gatherings, much like your floral lace blouse.



Brand: Retail

Price: 30.00

Recommendation: With a lightweight and breathable fabric, this blouse mirrors the airy quality of your Gucci top and includes intricate lace patterns, perfect for summer outings and semi-formal occasions.





Luxury

Luxury

Luxury

Luxury

Luxury

Luxury

Luxury

Luxury