



# **FASHION DATASET GATHERING, FILTERING AND STORING IN A DATABASE**

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# Aim of the bigger project : Fashion Trend Forecasting by using Machine Learning

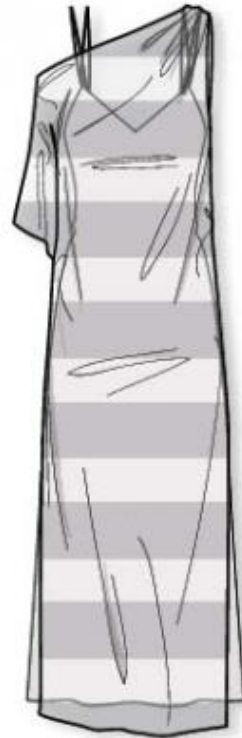
- Trend -  
The behavior of large group of people, that is accepted and followed extensively for a period of time.
- Fashion Trends -
- The direction of movement of public acceptance of color, texture, and silhouette in fashion.
- Newest styles and silhouettes
- Important colors for upcoming seasons
- Newest developments in the fiber and fabric markets

# Fashion Forecasting

- “Trends are profits waiting to happen”
- For mainstream brands, timing is essential
- Right product, Right place, Right time

KEY ITEMS | DRESSES • SS 18

*Adventurous Navy*



**BOLD COLOURED STRIPES**

| long layered dress | focus on shoulders |  
| transparencies |



19-4063 TCX



11-0901 TCX

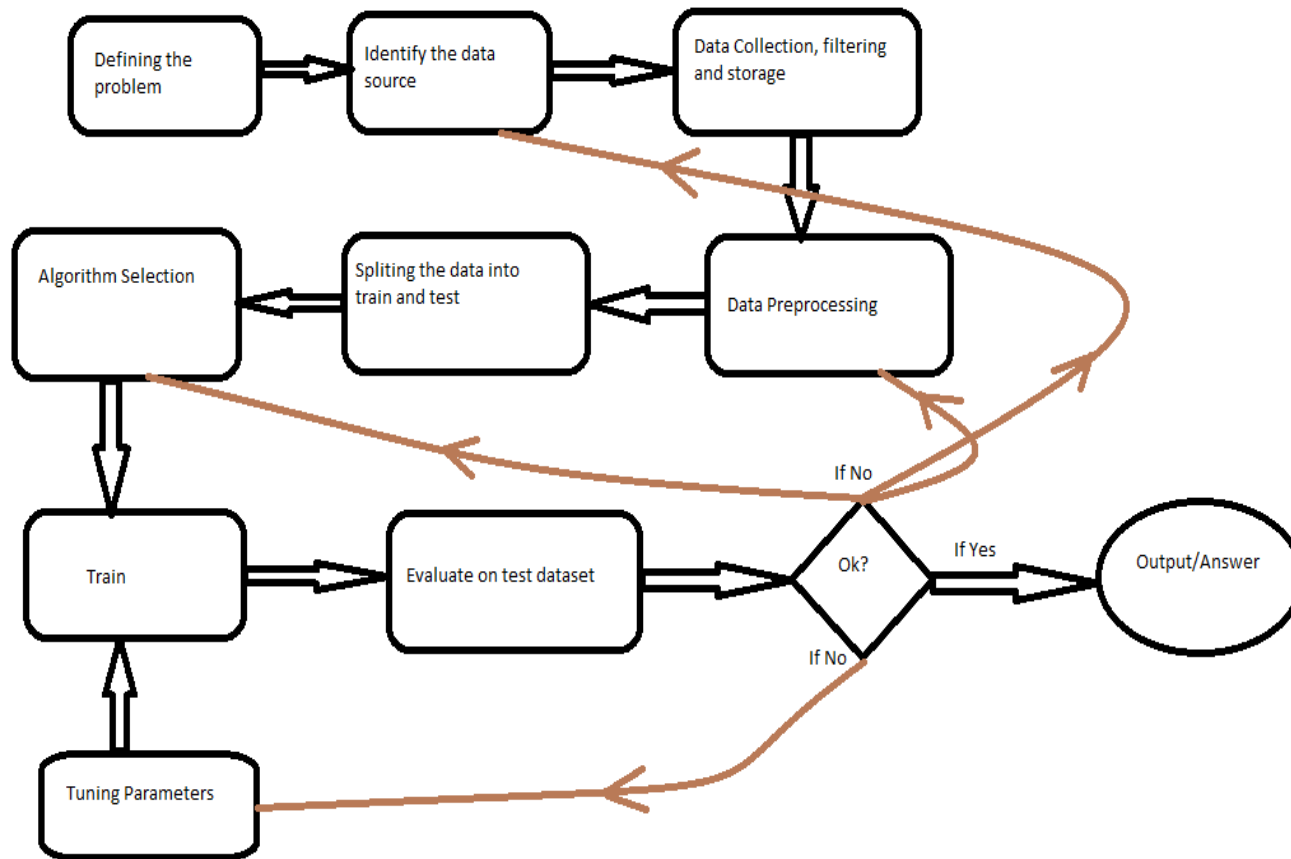


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WOMENSWEAR | DEVELOPMENT • SS 18

**5**forecaStore

# Traditional vs Our Intelligent Trend Forecasting Approach



- Social Networking and photo sharing websites are playing a major role in today's customer demands
- AI based approach to recognize and detect fashion trends from social networks and websites will be more accurate than traditional forecasting methods which mainly rely on the predictions of experienced experts.
- Significantly lesser time



TOP

WHITE



URBAN

STREETWEAR

SWEATSHIRT

OFF-WHITE



SKIRT

REGULAR

CHANEL  
TIMELESS

MINI



PINK

BLACK



DRESS

BROWN

BLACK

CHIC

BELT

OUTDOOR



BAG

CHLOÉ TESS

SADDLE BAG

BROWN



# Features and Labels

## Features -

- Category
- Design specification
- Location/Geography
- Gender
- Brand Name
- Price
- Color

## Label for Supervised Learning -

- Popularity rate

# Relevant data source

## Instagram –

- No of photos shared to date - 50 billion +
- The number of Instagram Likes per day:  
4.2 billion

## Twitter –

- Number of followers in Fashion industry – 100 million

## Popular Fashion Retailer websites-

- Chanel , Burberry, H&M, Dior, Hugo Boss ,  
etc.

What data are we collecting from the social networks and websites ?

- Images of the Fashion items – clothes, shoes , accessories, etc.
- Text – number of likes , comments , number of followers, location , name of brands, amount of price, product category, etc.

# Influencer Identification from Social Networks

- Who are Fashion Influencers ?

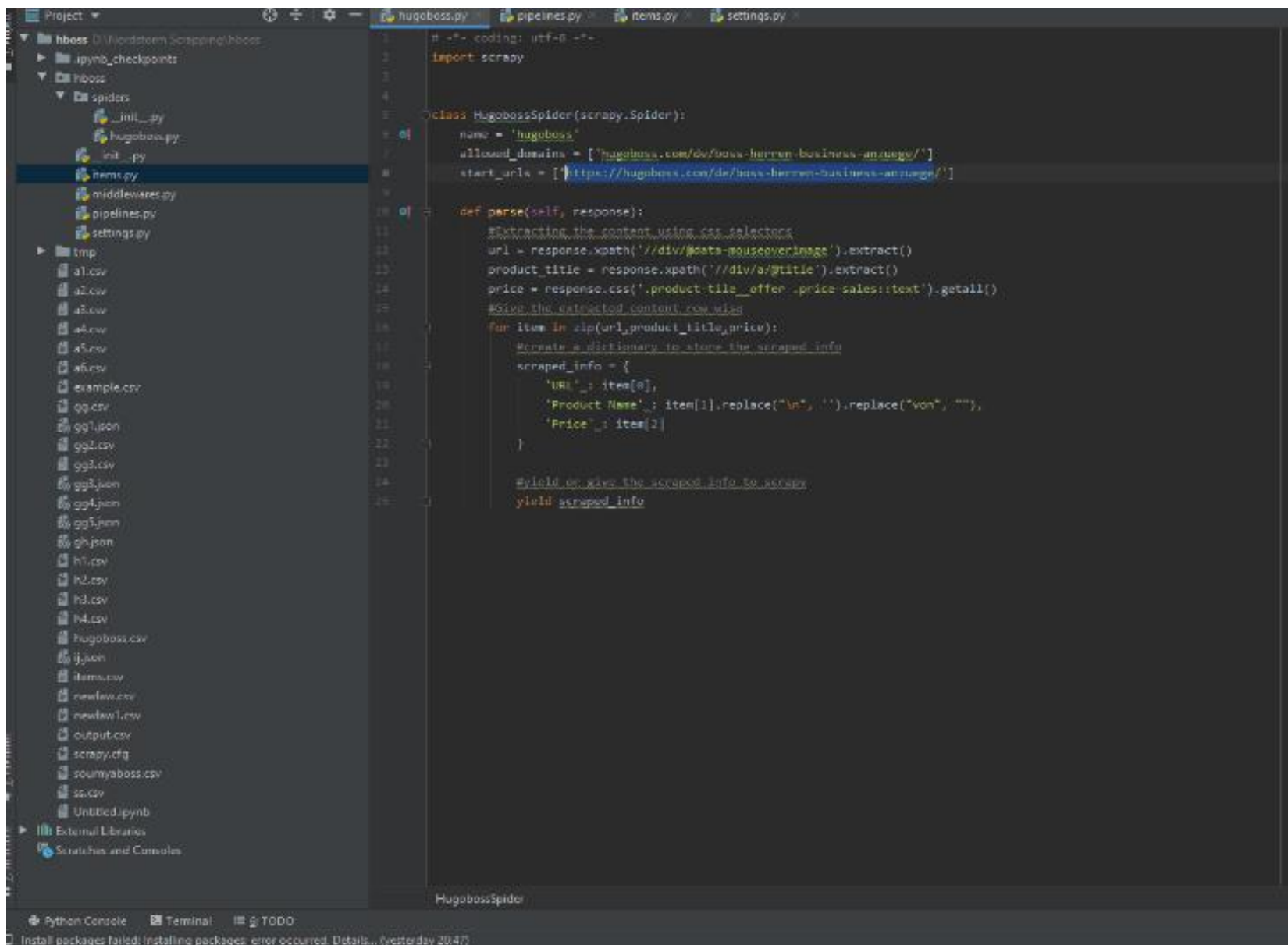
A fashion influencer is a personality that has a large number of followers on social media, creates mainly fashion content and has the power to influence the opinion and purchase behavior of others with their recommendations.

Brands endorse them to attend fashion shows, parties, designer dinners and exclusive trips and to wear their clothes on social media.

In 2017, Forbes named Chiara Ferragni, Danielle Bernstein, Julia Engel, Gabi Gregg, Jenn Im, Susanna Lau, Nicolette Mason, Simone Zippi Stardust, Aimee Song and Bryan Yambao, also known as Bryanboy, as the top influencers in the fashion category

- How do we identify influencers from social networks ?





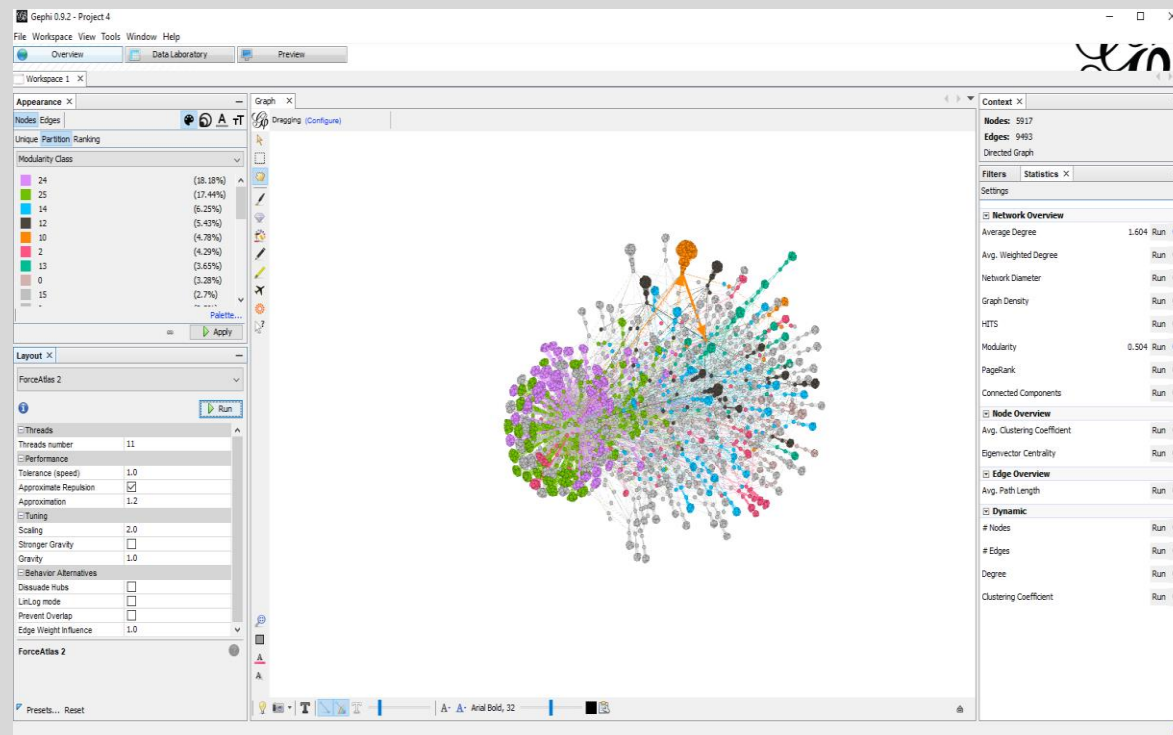
# Data Scraping using 'Scrapy'

- Scrapy is a free and open-source web-crawling framework written in Python.
- Scrapy has built-in support for extracting data from HTML sources using XPath expression and CSS expression.
- It can be Easily Extensible.
- It can able to extract the websites with 20 times faster than other frameworks like BeautifulSoup or Selenium.
- The scraped texts were saved in .csv format.



# Influencer Identification with ‘Gephi’

- Gephi is an open-source network analysis and visualization software package written in Java on the NetBeans platform.
- After exporting the data to Gephi from our CSV file, we used ‘Force Atlas 2’ to visualize the network and then from the ‘In-degree’ chart , we can determine about the influence of the profiles.



# Influencer determination from with 'Gephi' In-degree chart

Gephi 0.9.2 - Project 4

File Workspace View Tools Window Help

Overview Data Laboratory Preview

Workspace 1

Data Table

Nodes Edges Configuration Add node Add edge Search/Replace Import Spreadsheet Export table More actions Filter: Id

Id	Label	Interval	In-Degree	Out-Degree	Degree	Modularity Class
Open Twitter Page for This Person	Open Twitter Page for This Person		214	0	214	14
Yes	Yes		190	0	190	13
Follows	Follows		131	0	131	24
9/30/19 2:03	9/30/19 2:03		131	0	131	25
Mentions	Mentions		101	0	101	25
Tweet	Tweet		91	0	91	10
twitter.com	twitter.com		74	0	74	12
supersoftknits	supersoftknits		66	143	209	3
RT @SuperSoftKnits: #Ivory #Bolero #Cashm...	RT @SuperSoftKnits: #Ivory #Bolero #Cashm...		46	0	46	24
ivory bolero cashmere silk bridalbolero knit we...	ivory bolero cashmere silk bridalbolero knit we...		46	0	46	24
michelleroseg33	michelleroseg33		43	139	182	25
zencatpottery	zencatpottery		41	56	97	24
okrogules	okrogules		41	58	99	24
watsonsVintage	watsonsVintage		40	132	172	9
tanyawarren	tanyawarren		39	100	139	24
fast_shipper555	fast_shipper555		38	128	166	24
etsy	etsy		38	20	58	14
lampworkbench	lampworkbench		38	78	116	25
kanithascrafts	kanithascrafts		38	68	106	9
products_hot	products_hot		37	80	117	25
kathrynsscifts	kathrynsscifts		36	105	141	7
beachpause	beachpause		36	99	135	25
kneecree	kneecree		35	101	136	24
kaosonia	kaosonia		35	50	85	25
makaila410	makaila410		34	115	149	24
lynnrosedesign	lynnrosedesign		34	82	116	20
belleepoquec	belleepoquec		33	71	104	28
veron2v	veron2v		32	103	135	25
jewelr ymandave	jewelr ymandave		32	77	109	25
anderartstudio	anderartstudio		32	99	131	25
angieg3331	angieg3331		32	101	133	19
marthaperezbook	marthaperezbook		31	77	108	24
tsme29a	tsme29a		31	110	141	24
chestnutcrochet	chestnutcrochet		31	81	112	2

Add column Merge columns Delete column Clear column Copy data to other column Fill column with a value Duplicate column Create a boolean column from regex match Create column with list of regex matching groups Negate boolean values Convert column to dynamic

# Data Filtering by using ‘Pandas’

Data before  
being filtered

Removal of  
‘NaN’ and lines

Out[6]:

	URL	Product Name	Price
0	https://images.hugoboss.com/is/image/boss/hbeu...	In Italien gefertigte Chelsea Boots aus Leder ...	350,00 €
1	https://images.hugoboss.com/is/image/boss/hbeu...	NaN	350,00 €
2	https://images.hugoboss.com/is/image/boss/hbeu...	In Italien gefertigte Chelsea Boots aus Leder ...	199,00 €
3	https://images.hugoboss.com/is/image/boss/hbeu...	NaN	350,00 €
4	https://images.hugoboss.com/is/image/boss/hbeu...	Hybrid-Sneakers im Laufschuh-Stil mit Strickso...	150,00 €
5	https://images.hugoboss.com/is/image/boss/hbeu...	NaN	150,00 €
6	https://images.hugoboss.com/is/image/boss/hbeu...	In Italien gefertigte Chelsea Boots aus Leder ...	350,00 €
7	https://images.hugoboss.com/is/image/boss/hbeu...	NaN	199,00 €
8	https://images.hugoboss.com/is/image/boss/hbeu...	Hybrid-Sneakers mit feuchtigkeitsableitendem I...	99,00 €
9	https://images.hugoboss.com/is/image/boss/hbeu...	NaN	199,00 €
10	https://images.hugoboss.com/is/image/boss/hbeu...	Hybrid-Sneakers mit feuchtigkeitsableitendem I...	199,00 €
11	https://images.hugoboss.com/is/image/boss/hbeu...	NaN	350,00 €
12	https://images.hugoboss.com/is/image/boss/hbeu...	Chelsea Boots aus poliertem Leder mit gelasert...	299,00 €
13	https://images.hugoboss.com/is/image/boss/hbeu...	NaN	550,00 €
14	https://images.hugoboss.com/is/image/boss/hbeu...	Sneakers aus Velours- und Nappaleder	230,00 €
15	https://images.hugoboss.com/is/image/boss/hbeu...	NaN	199,00 €
16	https://images.hugoboss.com/is/image/boss/hbeu...	Hausschuhe aus Veloursleder mit Gummisohlen	350,00 €
17	https://images.hugoboss.com/is/image/boss/hbeu...	NaN	199,00 €
18	https://images.hugoboss.com/is/image/boss/hbeu...	Sneakers aus Velours- und Nappaleder	250,00 €
19	https://images.hugoboss.com/is/image/boss/hbeu...	NaN	150,00 €
20	https://images.hugoboss.com/is/image/boss/hbeu...	Sneakers aus Kunstleder im Retro-Look mit tran...	550,00 €
21	https://images.hugoboss.com/is/image/boss/hbeu...	NaN	199,00 €
22	https://images.hugoboss.com/is/image/boss/hbeu...	In Italien gefertigte Derbys aus geprägtem Lac...	550,00 €
23	https://images.hugoboss.com/is/image/boss/hbeu...	NaN	199,00 €
24	https://images.hugoboss.com/is/image/boss/hbeu...	In Italien gefertigte Lowtop Sneakers mit Meis...	170,00 €
25	https://images.hugoboss.com/is/image/boss/hbeu...	NaN	99,00 €
26	https://images.hugoboss.com/is/image/boss/hbeu...	In Italien gefertigte Derbys aus gewalktem Led...	199,00 €
27	https://images.hugoboss.com/is/image/boss/hbeu...	NaN	199,00 €
28	https://images.hugoboss.com/is/image/boss/hbeu...	Ledersneakers im Laufschuh-Stil mit Monogramm...	195,00 €
29	https://images.hugoboss.com/is/image/boss/hbeu...	NaN	195,00 €
30	https://images.hugoboss.com/is/image/boss/hbeu...	Leder-Sneakers mit Einsätzen aus grobem Mesh	195,00 €

In [9]: `data= data.dropna()  
data`

Out[9]:

	URL	Product Name	Price
0	https://images.hugoboss.com/is/image/boss/hbeu...	In Italien gefertigte Chelsea Boots aus Leder ...	350,00 €
2	https://images.hugoboss.com/is/image/boss/hbeu...	In Italien gefertigte Chelsea Boots aus Leder ...	199,00 €
4	https://images.hugoboss.com/is/image/boss/hbeu...	Hybrid-Sneakers im Laufschuh-Stil mit Strickso...	150,00 €
6	https://images.hugoboss.com/is/image/boss/hbeu...	In Italien gefertigte Chelsea Boots aus Leder ...	350,00 €
8	https://images.hugoboss.com/is/image/boss/hbeu...	Hybrid-Sneakers mit feuchtigkeitsableitendem I...	99,00 €
10	https://images.hugoboss.com/is/image/boss/hbeu...	Hybrid-Sneakers mit feuchtigkeitsableitendem I...	199,00 €
12	https://images.hugoboss.com/is/image/boss/hbeu...	Chelsea Boots aus poliertem Leder mit gelasert...	299,00 €
14	https://images.hugoboss.com/is/image/boss/hbeu...	Sneakers aus Velours- und Nappaleder	230,00 €
16	https://images.hugoboss.com/is/image/boss/hbeu...	Hausschuhe aus Veloursleder mit Gummisohlen	350,00 €
18	https://images.hugoboss.com/is/image/boss/hbeu...	Sneakers aus Velours- und Nappaleder	250,00 €
20	https://images.hugoboss.com/is/image/boss/hbeu...	Sneakers aus Kunstleder im Retro-Look mit tran...	550,00 €
22	https://images.hugoboss.com/is/image/boss/hbeu...	In Italien gefertigte Derbys aus geprägtem Lac...	550,00 €
24	https://images.hugoboss.com/is/image/boss/hbeu...	In Italien gefertigte Lowtop Sneakers mit Meis...	170,00 €
26	https://images.hugoboss.com/is/image/boss/hbeu...	In Italien gefertigte Derbys aus gewalktem Led...	199,00 €
28	https://images.hugoboss.com/is/image/boss/hbeu...	Ledersneakers im Laufschuh-Stil mit Monogramm...	195,00 €
30	https://images.hugoboss.com/is/image/boss/hbeu...	Leder-Sneakers mit Einsätzen aus grobem Mesh	195,00 €
32	https://images.hugoboss.com/is/image/boss/hbeu...	In Italien gefertigte Derbys aus pflanzlich ge...	299,00 €
34	https://images.hugoboss.com/is/image/boss/hbeu...	Leder-Sneakers mit Einsätzen aus grobem Mesh	170,00 €
36	https://images.hugoboss.com/is/image/boss/hbeu...	Laufschuhe aus poliertem Leder mit cognacfarbe...	199,00 €
38	https://images.hugoboss.com/is/image/boss/hbeu...	Hybrid-Sneakers mit feuchtigkeitsableitendem I...	299,00 €

# How the collected data now looks like

- Scraped T-shirt Images from Hugo Boss website



# How the collected data now looks like

- Twitter scraped data from an influencer with username 'supersoftknits'

fx	30																	
	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	created_at	date	time	timezone	user_id	username	name	tweet	mentions	urls	photos	retweets_count	likes_count	hashtags	link	quote_url	reply_to	retweet_date
2	1570465796000	2019-10-07	18:29:56	W. Europe Dayli	2593453063	supersoftknits	Soft Knits	#Ivory #Bolero # [etsy]		['https://etsy.me/', 'https://pbs.twimg.com/media/']		8	4	['#ivory', '#bolero']	<a href="https://twitter.com/SuperSoftKnits/">https://twitter.com/SuperSoftKnits/</a>		['user_id': '2593453063', 'username': 'supersoftknits']	
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23	1566895046000	2019-08-27	10:37:26	W. Europe Dayli	2593453063	supersoftknits	Soft Knits	#Bridal #bolero # [etsy]		['https://etsy.me/', 'https://pbs.twimg.com/media/']		10	5	['#bridal', '#bolero']	<a href="https://twitter.com/SuperSoftKnits/">https://twitter.com/SuperSoftKnits/</a>		['user_id': '2593453063', 'username': 'supersoftknits']	
24	1566750945000	2019-08-25	18:35:45	W. Europe Dayli	2593453063	supersoftknits	Soft Knits	#Ivory #Bolero # [etsy]		['https://etsy.me/', 'https://pbs.twimg.com/media/']		24	15	['#ivory', '#bolero']	<a href="https://twitter.com/SuperSoftKnits/">https://twitter.com/SuperSoftKnits/</a>		['user_id': '2593453063', 'username': 'supersoftknits']	
25	1566588374000	2019-08-23	21:26:14	W. Europe Dayli	2593453063	supersoftknits	Soft Knits	#Bridal #bolero # [etsy]		['https://etsy.me/', 'https://pbs.twimg.com/media/']		58	30	['#bridal', '#bolero']	<a href="https://twitter.com/SuperSoftKnits/">https://twitter.com/SuperSoftKnits/</a>		['user_id': '2593453063', 'username': 'supersoftknits']	
26	1566110376000	2019-08-18	8:39:36	W. Europe Dayli	2593453063	supersoftknits	Soft Knits	#Bridal #bolero # [etsy]		['https://etsy.me/', 'https://pbs.twimg.com/media/']		11	4	['#bridal', '#bolero']	<a href="https://twitter.com/SuperSoftKnits/">https://twitter.com/SuperSoftKnits/</a>		['user_id': '2593453063', 'username': 'supersoftknits']	
27	1565923900000	2019-08-16	4:51:40	W. Europe Dayli	2593453063	supersoftknits	Soft Knits	#Ivory #Bolero # [etsy]		['https://etsy.me/', 'https://pbs.twimg.com/media/']		17	8	['#ivory', '#bolero']	<a href="https://twitter.com/SuperSoftKnits/">https://twitter.com/SuperSoftKnits/</a>		['user_id': '2593453063', 'username': 'supersoftknits']	
28	1565211311000	2019-08-07	22:55:11	W. Europe Dayli	2593453063	supersoftknits	Soft Knits	#Ivory #Wedding [etsy]		['https://etsy.me/', 'https://pbs.twimg.com/media/']		26	13	['#ivory', '#wedding']	<a href="https://twitter.com/SuperSoftKnits/">https://twitter.com/SuperSoftKnits/</a>		['user_id': '2593453063', 'username': 'supersoftknits']	
29	1564941290000	2019-08-04	19:54:50	W. Europe Dayli	2593453063	supersoftknits	Soft Knits	#Ivory #Bolero # [etsy]		['https://etsy.me/', 'https://pbs.twimg.com/media/']		12	3	['#ivory', '#bolero']	<a href="https://twitter.com/SuperSoftKnits/">https://twitter.com/SuperSoftKnits/</a>		['user_id': '2593453063', 'username': 'supersoftknits']	
30	1564563807000	2019-07-31	11:03:27	W. Europe Dayli	2593453063	supersoftknits	Soft Knits	#Bridal #bolero # [etsy]		['https://etsy.me/', 'https://pbs.twimg.com/media/']		16	10	['#bridal', '#bolero']	<a href="https://twitter.com/SuperSoftKnits/">https://twitter.com/SuperSoftKnits/</a>		['user_id': '2593453063', 'username': 'supersoftknits']	
31	1564335623000	2019-07-28	19:40:23	W. Europe Dayli	2593453063	supersoftknits	Soft Knits	#Ivory #Bolero # [etsy]		['https://etsy.me/', 'https://pbs.twimg.com/media/']		21	8	['#ivory', '#bolero']	<a href="https://twitter.com/SuperSoftKnits/">https://twitter.com/SuperSoftKnits/</a>		['user_id': '2593453063', 'username': 'supersoftknits']	
32	1564050273000	2019-07-25	12:24:33	W. Europe Dayli	2593453063	supersoftknits	Soft Knits	#Ivory #bolero # [etsy]		['https://etsy.me/', 'https://pbs.twimg.com/media/']		14	9	['#ivory', '#bolero']	<a href="https://twitter.com/SuperSoftKnits/">https://twitter.com/SuperSoftKnits/</a>		['user_id': '2593453063', 'username': 'supersoftknits']	
33	1564046490000	2019-07-25	10:50:49	W. Europe Dayli	2593453063	supersoftknits	Soft Knits	#Ivory #Bolero # [etsy]		['https://etsy.me/', 'https://pbs.twimg.com/media/']		8	7	['#ivory', '#bolero']	<a href="https://twitter.com/SuperSoftKnits/">https://twitter.com/SuperSoftKnits/</a>		['user_id': '2593453063', 'username': 'supersoftknits']	
34	1563969500000	2019-07-24	13:58:20	W. Europe Dayli	2593453063	supersoftknits	Soft Knits	#Bridal #bolero # [etsy]		['https://etsy.me/', 'https://pbs.twimg.com/media/']		8	6	['#bridal', '#bolero']	<a href="https://twitter.com/SuperSoftKnits/">https://twitter.com/SuperSoftKnits/</a>		['user_id': '2593453063', 'username': 'supersoftknits']	
35	15630608609000	2019-07-20	9:43:29	W. Europe Dayli	2593453063	supersoftknits	Soft Knits	#Ivory #Bolero # [etsy]		['https://etsy.me/', 'https://pbs.twimg.com/media/']		5	10	['#ivory', '#bolero']	<a href="https://twitter.com/SuperSoftKnits/">https://twitter.com/SuperSoftKnits/</a>		['user_id': '2593453063', 'username': 'supersoftknits']	
36	1563459506000	2019-07-18	16:18:26	W. Europe Dayli	2593453063	supersoftknits	Soft Knits	#Ivory #Bolero # [etsy]		['https://etsy.me/', 'https://pbs.twimg.com/media/']		14	10	['#ivory', '#bolero']	<a href="https://twitter.com/SuperSoftKnits/">https://twitter.com/SuperSoftKnits/</a>		['user_id': '2593453063', 'username': 'supersoftknits']	



Documents

Aggregations

Explain Plan

Indexes

FILTER

INSERT DOCUMENT

VIEW

LIST

TABLE

```
URL: "https://images.hugoboss.com/is/image/boss/hbeu50414734_401_200"
Product Name: "In Italien gefertigte Chelsea Boots aus Leder mit Outlast®-Innenfutter"
Price: "199,00 €"
```

```
_id: ObjectId("5d9a0363bdc3629f01efe300")
: 4
URL: "https://images.hugoboss.com/is/image/boss/hbeu50407672_105_200"
Product Name: "Hybrid-Sneakers im Laufschuh-Stil mit Stricksocken"
Price: "150,00 €"
```

```
> _id: ObjectId("5d9a0363bdc3629f01efe301")
: 6
URL: "https://images.hugoboss.com/is/image/boss/hbeu50415982_001_200"
Product Name: "In Italien gefertigte Chelsea Boots aus Leder mit Outlast®-Innenfutter"
Price: "350,00 €"
```

```
_id: ObjectId("5d9a0363bdc3629f01efe302")
: 8
URL: "https://images.hugoboss.com/is/image/boss/hbeu50420914_001_200"
Product Name: "Hybrid-Sneakers mit feuchtigkeitsableitendem Innenfutter"
Price: "99,00 €"
```

```
_id: ObjectId("5d9a0363bdc3629f01efe303")
: 12
URL: "https://images.hugoboss.com/is/image/boss/hbeu50422647_100_200"
Product Name: "Chelsea Boots aus poliertem Leder mit gelaserten Details"
Price: "299,00 €"
```

```
_id: ObjectId("5d9a0363bdc3629f01efe304")
: 14
URL: "https://images.hugoboss.com/is/image/boss/hbeu50420200_460_200"
Product Name: "Sneakers aus Velours- und Nappaleder"
Price: "230,00 €"
```

```
_id: ObjectId("5d9a0363bdc3629f01efe305")
: 16
URL: "https://images.hugoboss.com/is/image/boss/hbeu50422650_001_200"
Product Name: "Hausschuhe aus Veloursleder mit Gummisohlen"
Price: "350,00 €"
```

# Data Storing in MongoDB

- It's a query language that is rich and supports text search, aggregation features, and CRUD operations.
- It requires lesser input and output operations due to embedded data models, unlike relational databases. MongoDB indexes also support faster queries.
- It employs multiple storage engines, thereby ensuring the right engine is used for the right workload, which in turn enhances performance.

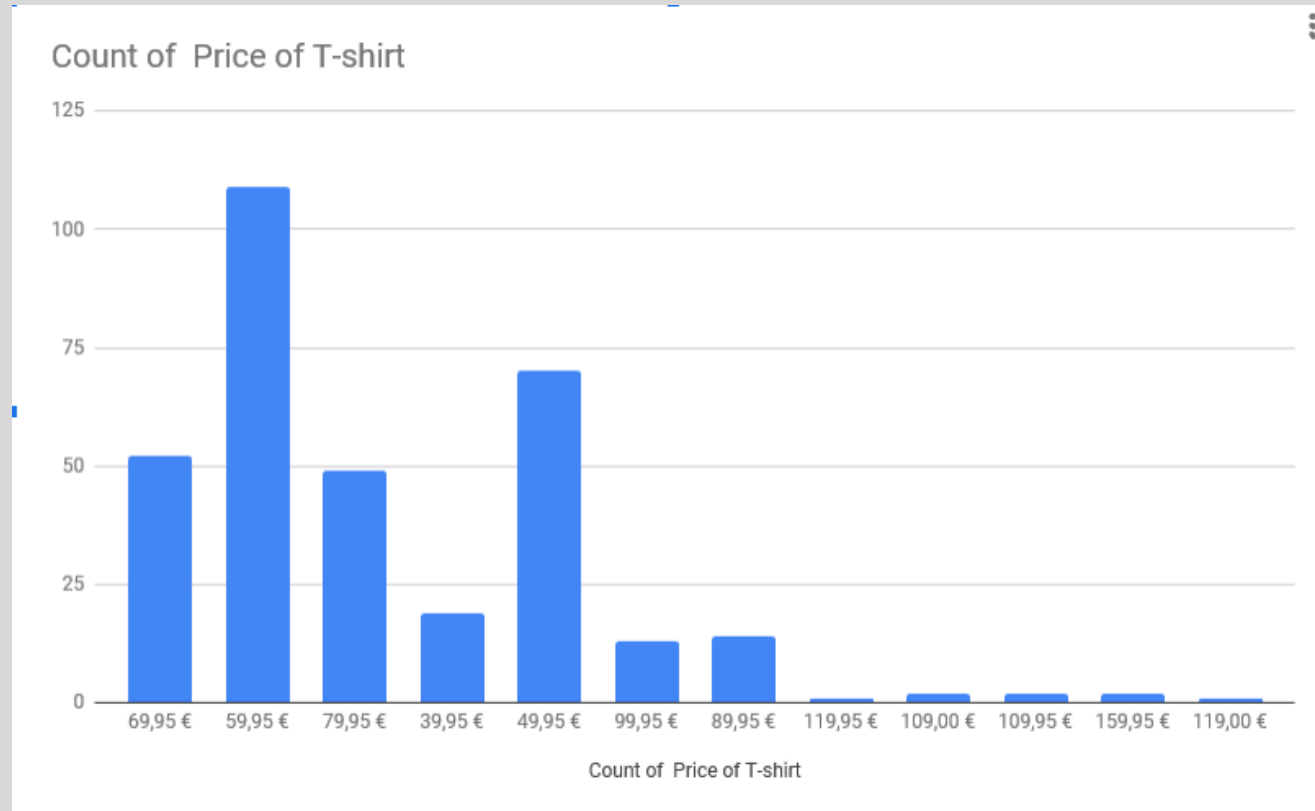
# Statistics of dataset collected

INSTAGRAM	TWITTER	HUGOBOSS
Total Images : 10K	Tweets : 15k	Clothing items : 3k( Images, Image URLs, product name and product price)
Total Comments : 65K	Community : Cashmere	Clothing type: 80
Community : Cashmere		Online Shop

# Chart Analysis of Hugo Boss collected data



# Chart Analysis of Hugo Boss collected data



# Next Steps

Implementation of machine learning techniques to forecast fashion trends will take place.



Thank You