

## " Evaluation and testing result Clothing store Recommendation system "

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This evaluation report has main two parts ; the first one has the past purchased model with the query models and the second part has the model of past purchased items recommendation alone for a customer. For the first part 13 people were given the chance to use our system and search for items through the three models which are the tfidf query , the bert query and the bert query along with the past purchases model and they gave us the feedback, this table has the main results and in the upcoming pages each experiment is attached with more details. The results are analyzed in the main report.

EXPIREMENT NUM	Arabic Query	Query	Most relevant model
1		White dress cotton	Bert query
2		Red trouser menswear	Bert query
3		Green button shirt menswear upper body	Bert
4		Pyjama set kids red	Past purchases query model
5		Pink Skirt with flowers	Past purchases query
6		Vest top women black	Bert query
7		Blue blazer ladieswear with buttons	Tf-idf
8		Pink Skirt with flowers	Tf-idf
9		Leggings cotton purple	Tf-idf
10		Dress girls sleeveless	Tf-idf
11	حلق ذهبي صغير	Gold earrings	Tf-idf
12	شنطة للظهر سودا	Black backpack	Tf-idf
13		White Beanie kids	Tf-idf

Table 1: Main Testing Queries

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# Evaluation of the Query and past purchased merged system:

## EXPERIMENT #1:

Query	Result from tf-idf	Result from Bert query	Result from Bert query and past purchases	Comparison between results
White dress cotton	Perfect dresses and white	All of the results were dresses and all were white	Only one result was relevant and brought back a dress	Bert query  Bert and past purchases  Tf-idf

Table 2: experiment 1 observations

```
Results using tfidf query:
with query: white dress cotton dress white
singa dress garment full body pattern white dusty light ladieswear womens tailor ladies knee length pleat chiffon narrow shoulder strap tie belt waist line
singa dress garment full body solid black dark ladieswear womens tailor ladies knee length pleat chiffon narrow shoulder strap tie belt waist line
singa dress garment full body solid dark red medium ladieswear womens tailor ladies knee length pleat chiffon narrow shoulder strap tie belt waist line
singa dress garment full body pattern white dusty light ladieswear womens tailor ladies short sleeveless cr pe weave pleat top small open back line
katsu dress garment full body pattern white light ladieswear womens tailor ladies short sleeveless cr pe weave pleat top small open back line
nova dress garment full body pattern light beige dusty white ladieswear womens tailor ladies short straight cut airy chiffon neck pleat front double layer yoke gather shoulder back narrow tie belt waist line
tulip dress garment full body pattern white dusty light ladieswear womens tailor ladies knee length airy chiffon neck detail shoulder short cap sleeves button front elastication back waist sew tie belt satin line
masa dress garment full body solid white dusty light ladieswear womens tailor ladies sleeveless knee length weave fabric detachable belt waist cover metal buckle line
teddy dress garment full body stripe white dusty light ladieswear womens tailor ladies knee length weave fabric collar neck conceal button front sleeves pleat cuff seam detachable ring belt waist unlined
malva dress garment full body solid white dusty light ladieswear womens tailor ladies sleeveless knee length weave fabric collar neck open conceal button front seam waist belt metal ring unlined
```

Figure 1: tf-idf recommendation

```
Results using Bert query:
Results using all:
with query: white dress cotton
singa dress garment full body pattern white dusty light ladieswear womens tailor ladies knee length pleat chiffon narrow shoulder strap tie belt waist line
inani dress garment full body solid white dusty light ladieswear womens tailor ladies flare calf length satin neck small stand collar long tie front short wide raglan sleeves tiers hem line
nova dress garment full body pattern white dusty light ladieswear womens tailor ladies sleeveless cr pe weave neck small stand collar gather shoulder seam tie waist line
sunflower dress garment full body pattern white dusty light ladieswear womens everyday collection ladies calf length airy cotton v-neck smock bodice neck narrow adjustable shoulder strap unlined
sorrell dress garment full body pattern white dusty light ladieswear womens everyday collection ladies calf length soft viscose weave neck conceal button front yoke pleat back drop shoulder short sleeves sew turn unlined
nova dress garment full body stripe white dusty light ladieswear womens tailor ladies sleeveless cr pe weave neck small stand collar gather shoulder seam tie waist line
tulip dress garment full body pattern white dusty light ladieswear womens tailor ladies knee length airy chiffon neck detail shoulder short cap sleeves button front elastication back waist sew tie belt satin line
singa dress garment full body solid dark red medium ladieswear womens tailor ladies knee length pleat chiffon narrow shoulder strap tie belt waist line
Florence dress garment full body pattern white light ladieswear womens everyday collection ladies straight cut knee length airy viscose weave open button back neck trumpet sleeves unlined
Florence dress garment full body pattern white light ladieswear womens everyday collection ladies straight cut knee length airy viscose weave open button back neck trumpet sleeves unlined
```

Figure 2: Bert query recommendation

```
Results using Bert query + past purchases:
Results using all + past g:
with query: white dress cotton
five piece six set garment full body pattern light pink dusty baby girl jersey fancy size children dress sweatshirt top two pair leggings soft cotton long sleeves flounce trim sleeved fabric press stud one shoulder except open button back neck cover elastic
major set garment full body pattern light turquoise dusty baby boy jersey fancy size children soft cotton shirt press stud one shoulder except two long sleeved top lightweight print sweatshirt fabric rib around neckline cuff hem pair joggers elasticated waist
major set garment full body solid pattern dark green medium dusty baby boy jersey fancy size children soft cotton shirt press stud one shoulder except two long sleeved top lightweight print sweatshirt fabric rib around neckline cuff hem pair joggers elasticated waist
ceramse set garment full body check dark blue baby boy weave size children jersey knit six long sleeved shirt waistcoat bow tie pair trousers cotton button collar front cuff lightly brush back make line fabric adjustable elastic strap plastic fastener elastic
fun fancy reversible seamed sweater garment upper body greenish khaki dark green kid boy jersey children size baby long sleeved top soft sweatshirt fabric reversible notiv front normal sequins rib around neckline cuff hem brush inside
major set garment full body six solid pattern dark grey baby boy jersey fancy size children soft cotton shirt press stud one shoulder except two long sleeved top lightweight print sweatshirt fabric rib around neckline cuff hem pair joggers elasticated waist
clara long jumpsuit pyjama playsuit nightwear pattern greenish khaki medium dusty green young girl jersey fancy children size baby short sleeved soft viscose open button back neck elasticated seam waist decorative bow front calf length legs
ceramse set garment full body stripe dark grey medium dusty baby boy weave size children jersey knit six long sleeved shirt waistcoat bow tie pair trousers cotton button collar front cuff lightly brush back make line fabric adjustable elastic strap plastic fastener
pickle jumpsuit pyjama playsuit nightwear front print grey dusty light young girl jersey fancy children size baby sleeveless soft low neckline decorative crossover strap back elasticated seam waist side pocket short legs
jason cardigan set shirt garment upper body solid dark blue kid boy children size baby bow tie cotton weave collar button front long sleeves cuff fine knit soft neck rib around neckline hem pre adjustable elastic strap plastic fastener back
its using all:
```

Figure 3: Bert query + past purchases recommendation

## EXPERIMENT #2:

Query	Result from tf-idf	Result from Bert query	Result from Bert query and past purchases	Comparison between results
Red trouser menswear trouser men	All of them were trousers but not red	All of them were trousers but not red	All of them were trousers but not red <b>but it got</b> with denim and jeans which is more formal and closer to the past purchases.	Bert query  Bert and past purchases  Tf-idf

Table 3: experiment 2 observations

```
Results: Results using df_all:
with query: Red trouser menswear
slim straight pkt trousers garment lower body denim dark grey menswear men pocket jeans wash regular waist button fly legs
slim straight pkt trousers garment lower body denim dark grey menswear men pocket jeans wash regular waist button fly legs
slim straight pkt trousers garment lower body denim dark blue menswear men pocket jeans wash regular waist button fly legs
skinny pkt trash trousers garment lower body denim light grey dusty menswear men pocket low rise jeans wash stretch hard wear detail button fly legs
slim straight pkt trousers garment lower body denim dark blue medium dusty menswear men pocket jeans wash regular waist button fly legs
slim straight premiumprice trousers garment lower body denim dark blue menswear men pocket jeans wash regular waist button fly legs
slim straight pkt trousers garment lower body denim light blue menswear men pocket jeans wash regular waist button fly legs
slim pkt trousers garment lower body denim dark blue menswear men pocket jeans wash stretch regular waist button fly legs
skinny pkt midnight trousers garment lower body denim dark grey menswear men pocket jeans wash stretch regular waist button fly legs
slim pkt trousers garment lower body denim grey medium dusty menswear men pocket jeans wash stretch regular waist button fly legs
```

Figure 4: Bert query recommendation

```
Results: Results tfidf query:
with query: red trousers menswear trousers men
straight pkt trousers garment lower body denim light blue dusty menswear men pocket jeans wash regular waist button fly legs
straight pkt trousers garment lower body denim blue dusty light menswear men pocket jeans wash regular waist button fly legs
slim straight pkt trousers garment lower body denim light blue dusty menswear men pocket jeans wash regular waist button fly legs
slim straight pkt trousers garment lower body denim light blue menswear men pocket jeans wash regular waist button fly legs
slim straight pkt trousers garment lower body denim blue light menswear men pocket jeans wash regular waist button fly legs
straight pkt trousers garment lower body denim blue medium dusty menswear men pocket jeans wash regular waist button fly legs
slim straight pkt trousers garment lower body denim dark blue menswear men pocket jeans wash regular waist button fly legs
slim straight pkt trousers garment lower body denim blue medium dusty menswear men pocket jeans wash regular waist button fly legs
slim straight pkt trousers garment lower body denim blue medium dusty menswear men pocket jeans wash regular waist button fly legs
slim straight pkt trousers garment lower body denim blue medium dusty menswear men pocket jeans wash regular waist button fly legs
```

Figure 5: tf-idf recommendation

```
Results using df_all + cust_g:
with query: red trousers menswear trousers men
slim straight pkt trousers garment lower body denim light blue menswear men pocket jeans wash regular waist button fly legs
slim straight premiumprice trousers garment lower body denim dark blue menswear men pocket jeans wash regular waist button fly legs
slim straight pkt trousers garment lower body denim dark blue menswear men pocket jeans wash regular waist button fly legs
slim straight pkt trousers garment lower body denim dark grey menswear men pocket jeans wash regular waist button fly legs
slim straight pkt trousers garment lower body denim dark grey menswear men pocket jeans wash regular waist button fly legs
slim straight pkt trousers garment lower body denim blue light menswear men pocket jeans wash regular waist button fly legs
slim straight pkt trousers garment lower body denim dark blue medium dusty menswear men pocket jeans wash regular waist button fly legs
slim straight premiumprice trousers garment lower body denim blue light menswear men pocket jeans wash regular waist button fly legs
slim straight pkt trousers garment lower body denim blue medium menswear men pocket jeans wash regular waist button fly legs
skinny malcolm zip fly trousers garment lower body denim light blue dusty menswear men pocket jeans stretch regular waist button legs
```

Figure 6: past purchases + query recommendation

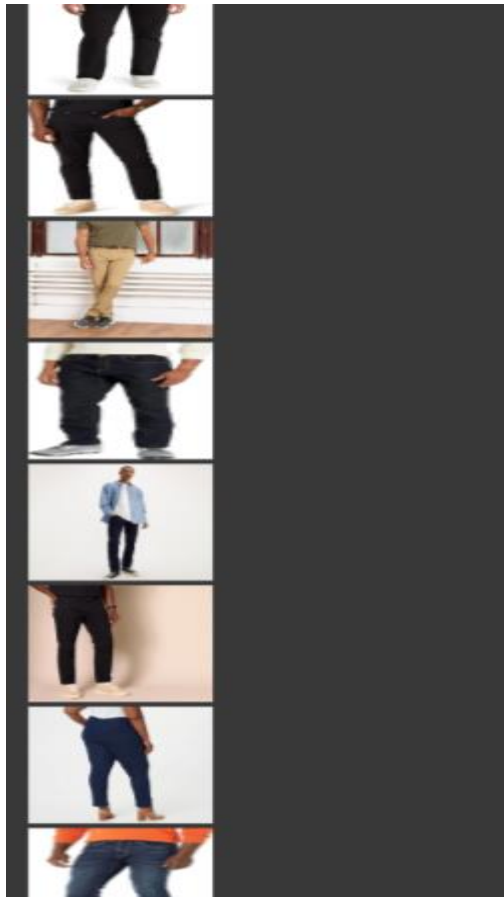


Figure 7: trousers brought back from the system

The images were relevant too.

### EXPERIMENT #3:

Query	Result from tf-idf	Result from Bert query	Result from Bert query and past purchases	Comparison between results
Green button shirt menswear upper body	All of returned items are shirts which is good, but not green	All of returned items are shirts which is good, also there were some green and all were menswear stuff so its good	2 of the returned items were green and 6 were shirts and they looked like the past purchased items.	Bert Bert and past purchased items TF-IDF

Table 4: experiment 3 observations

```
Results: Results using df.all:
with query: green button shirt menswear upper body green button shirt menswear upper body green button shirt menswear upper body
martini tee shirt garment upper body front print light yellow jersey fancy menswear contemporary smart cotton
raven pocket tee shirt garment upper body solid greenish khaki dark green knitwear menswear men edition straight cut soft cotton jersey relax style open chest short slit side
peter polo shirt garment upper body stripe dark red light basic jersey menswear men underwear short sleeved soft collar button placket
mike tee shirt garment upper body front print green bright jersey fancy menswear contemporary casual soft cotton
wow print tee shirt garment upper body front greenish khaki medium dusty green jersey fancy menswear contemporary street soft cotton round neckline motif
roll tee shirt garment upper body solid dark green khaki jersey basic menswear men underwear round neck cotton chest pocket short sleeves sew turn
martini tee shirt garment upper body front print dark grey jersey fancy menswear contemporary smart cotton
peter polo shirt garment upper body stripe dark blue medium dusty light basic jersey menswear men underwear short sleeved soft collar button placket
neck slim fit shirt garment upper body stripe dark red light basic jersey menswear men underwear soft cotton
neck slim fit shirt garment upper body stripe dark red light basic jersey menswear men underwear soft cotton
```

Figure 8: Bert query recommendation

```
Results: Results tfidf query:
with query: shirt Green button shirt menswear upper body shirt men
neck slim fit shirt garment upper body stripe red bright light basic jersey menswear men underwear soft cotton
neck slim fit shirt garment upper body stripe dark red light basic jersey menswear men underwear soft cotton
neck slim fit shirt garment upper body stripe dark red light basic jersey menswear men underwear soft cotton
neck slim fit shirt garment upper body stripe dark red light basic jersey menswear men underwear round soft cotton
neck slim fit shirt garment upper body stripe dark red light basic jersey menswear men underwear round soft
neck slim fit shirt garment upper body stripe dark red light basic jersey menswear men underwear round soft
neck slim fit shirt garment upper body stripe dark red light basic jersey menswear men underwear soft
neck slim fit shirt garment upper body stripe dark red light basic jersey menswear men underwear soft
neck slim fit shirt garment upper body solid dark red light basic jersey menswear men underwear round soft
neck slim fit shirt garment upper body melange red medium dusty basics menswear men underwear jersey basic soft cotton
[33370, 33373, 33369, 33371, 33372, 38, 37, 33376, 33374, 33377]
```

Figure 9: tf-idf recommendation

```
Results: Results using df.all + cust.q:
with query: green button shirt menswear upper body green button shirt menswear upper body green button shirt menswear upper body green button shirt menswear upper body
pack bowtie pin tie accessories pattern dark blue small menswear men set bow lapel pre jacquard weave adjustable strap fasten back metal decorative flower fabric length width
jam flannel set pyjama nightwear check dark red medium lounge menswear men underwear pyjama soft cotton long sleeved shirt notch lapels button front open chest pocket bottom elasticated waist side sea
raven pocket tee shirt garment upper body solid greenish khaki dark green knitwear menswear men edition straight cut soft cotton jersey relax style open chest short slit side
jacob cardigan set shirt garment upper body stripe blue medium kid boy children size baby bow tie long sleeved soft fine knit cotton neck button front rib around neckline cuff hem weave collar adjustable p
peter polo shirt garment upper body stripe dark blue medium light basic jersey menswear men underwear short sleeved soft collar button placket
peter polo shirt garment upper body stripe greenish khaki dusty light green basic jersey menswear men underwear short sleeved soft collar button placket
rockford pcs set taller waistcoat garment upper body structure dark blue kid boy shirt children size baby long sleeved bow tie cotton weave collar button front cuff adjustable elastic strap plastic fastene
peter polo shirt garment upper body stripe dark red light basic jersey menswear men underwear short sleeved soft collar button placket
```

Figure 10: past purchases + query recommendation

#### EXPERIMENT #4:

Query	Result from tf-idf	Result from Bert query	Result from Bert query and past purchases	Comparison between results
Pyjama set kids red	All were pyjamas but not red	All were pyjamas but not red	All were pyjamas but not red and more were like my past purchases	Bert + past purchases Bert Tf-idf

Table 5: experiment 4 observations

```
Display Comparison
Results: Results tfidf query:
with query: pyjama set kids red pyjama
velour pyjama jumpsuit playsuit nightwear application light pink dusty baby size children essentials complement one pyjama appliqué front press stud side leg
velour pyjama jumpsuit playsuit nightwear application light pink dusty baby size children essentials complement one pyjama appliqué front press stud side leg
velour pyjama jumpsuit playsuit nightwear application white light baby size children essentials complement one pyjama appliqué front press stud side leg
velour pyjama jumpsuit playsuit nightwear application light turquoise dusty baby size children essentials complement one pyjama appliqué front press stud side leg
velour pyjama jumpsuit playsuit nightwear application light pink dusty baby size children essentials complement one pyjama appliqué detail front feet press stud along one side leg
velour feet top pyjama jumpsuit playsuit nightwear application white light baby size children essentials complement one pyjama appliqué front press stud side leg
velour feet top pyjama jumpsuit playsuit nightwear pattern white light baby size children essentials complement one pyjama appliqué front press stud side leg
velour feet top pyjama jumpsuit playsuit nightwear application light turquoise dusty baby size children essentials complement one pyjama appliqué front press stud side leg
[3370, 33373, 33369, 33371, 33372, 38, 37, 33376, 33374, 33377]
```

Figure 11: tf-idf recommendation

```
Results: Results using df.all:
with query: pyjama set kids red Pyjama set kids red Pyjama set kids red Pyjama set kids red Pyjama set kids red
velour pyjama jumpsuit playsuit nightwear application light pink dusty baby size children essentials complement one pyjama appliqué front press stud side leg
velour pyjama jumpsuit playsuit nightwear application light pink dusty baby size children essentials complement one pyjama appliqué front press stud side leg
velour pyjama jumpsuit playsuit nightwear application light pink dusty baby size children essentials complement one pyjama appliqué detail front feet press stud along one side leg
velour pyjama jumpsuit playsuit nightwear application dark blue baby size children essentials complement one pyjama appliqué front press stud side leg
velour pyjama jumpsuit playsuit nightwear application light turquoise dusty baby size children essentials complement one pyjama appliqué front press stud side leg
velour pyjama jumpsuit playsuit nightwear application white light baby size children essentials complement one pyjama appliqué detail front feet press stud along one side leg
velour pyjama jumpsuit playsuit nightwear application white light baby size children essentials complement one pyjama appliqué front press stud side leg
pyjama jumpsuit playsuit nightwear pattern light green baby size children essentials complement pyjama soft organic cotton jersey short sleeves legs press stud fasteners
pyjama jumpsuit playsuit nightwear front print light green baby size children essentials complement pyjama soft organic cotton jersey short sleeves legs press stud fasteners
fleece pyjama jumpsuit playsuit nightwear pattern light pink dusty baby size children essentials complement one pyjama soft fasten front along leg rib cuff hem
```

Figure 12: Bert query recommendation

```
Results using df_all + cust_q:
with query: pylana set kids red pylana set kids red pylana set kids red pylana set kids red pylana set kids red pylana set kids red pylana set kids red pylana set kids red
fun fleece set hat beanie accessories front print light pink dusty kid girl big acc children swimwear baby outerwear mittens soft motif appliques top ear flap rib cuff line
velour pylana jumpsuit playsuit nightwear application light pink dusty baby size children essentials complement one pylana applique front press stud side leg
velour pylana jumpsuit playsuit nightwear application light pink dusty baby size children essentials complement one pylana applique front press stud side leg
velour pylana jumpsuit playsuit nightwear application light pink dusty baby size children essentials complement pylana applique detail front feet press stud along one side leg
velour pylana jumpsuit playsuit nightwear application light turquoise dusty baby size children essentials complement one pylana applique front press stud side leg
pylana jumpsuit playsuit nightwear front print light green baby size children essentials complement pylana soft organic cotton jersey short sleeves legs press stud fasteners
fleece pylana jumpsuit playsuit nightwear pattern light pink dusty baby size children essentials complement one pylana soft fasten front along leg rib cuff hem
fleece pylana jumpsuit playsuit nightwear pattern light pink dusty baby size children essentials complement one pylana soft fasten front along leg rib cuff hem
```

Figure 13: past purchases + query recommendation

## EXPERIMENT #5:

Query	Result from tf-idf	Result from Bert query	Result from Bert query and past purchases	Comparison between results
Pink Skirt with flowers	Perfect results, all were skirts and 9 out of 10 were pink	Skirts but only one pink	ALL were skirts and they were all pink	Past purchases TF-IDF Bert

Table 6: experiment 5 observations

```
Results: Results tfidf query:
with query: skirt skirt pink lower body skirt
odill skirt garment lower body pattern light pink dusty jersey ladieswear womens trend fancy long mesh embroidery wide elasticsation waist conceal zip one side underskirt
odill skirt garment lower body embroidery black dark jersey ladieswear womens trend fancy long mesh wide elasticsation waist conceal zip one side underskirt
flamingo skirt garment lower body pattern light pink dusty jersey ladieswear womens trend fancy long pleat mesh elasticsation waist underskirt
glow skirt garment lower body pattern light pink ladieswear womens tailor pleat weave conceal zip one side line
tanja skirt garment lower body pattern light pink divide collection long airy weave elasticsation waist high slit side short underskirt
tanja skirt garment lower body pattern light pink divide collection long airy weave elasticsation waist high slit side short underskirt
coco skirt garment lower body structure light pink dusty ladieswear womens tailor short line sturdy textured weave high waist conceal zip back satin inner
rosie skirt garment lower body solid light pink dusty ladieswear womens tailor short weave sew wrapover conceal zip side wide flounce hem
florida skirt garment lower body solid light pink dusty ladieswear womens tailor pleat calf length weave fabric high elasticsation waist unlined
mae skirt garment lower body solid light pink dusty trousers ladieswear womens trend calf length mesh crinkle chiffon tiers conceal zip side underskirt
```

Figure 14: tf-idf recommendation

```
Display Comparison
Results: Results using df_all:
with query: skirt pink flowers lower body skirt pink flowers lower body skirt pink flowers lower body skirt pink flowers lower body skirt pink flowers lower body
miyabi dress garment full body colour black pink bright young girl children size baby skirt girls airy chiffon butterfly sleeves open button back neck elasticsation seam waist jersey line
miyabi dress garment full body colour black light blue dusty young girl children size baby skirt girls airy chiffon butterfly sleeves open button back neck elasticsation seam waist jersey line
miyabi dress garment full body colour black light turquoise young girl children size baby skirt girls airy chiffon short cap sleeves open button back neck elasticsation seam waist jersey line
miyabi dress garment full body colour black light blue dusty young girl children size baby skirt girls lightweight transparent weave round neckline open button back neck short butterfly sleeves narrow elasticsation seam waist
tomo dress garment full body solid red bright young girl children size baby skirt girls sleeveless chiffon elasticsation around neckline elasticsation seam waist asymmetric vertical flounce line
kenta lace blouse garment upper body light pink young girl dress children size baby skirt girls soft open button back neck long trumpet sleeves jersey line
miyabi dress garment full body colour black light turquoise young girl children size baby skirt girls lightweight transparent weave round neckline open button back neck short butterfly sleeves narrow elasticsation seam waist
lexi shirt garment upper body check pink dusty light young girl dress children size baby skirt girls soft cotton flannel collar button front chest pocket long sleeves cuff
tomo dress garment full body solid pink bright young girl children size baby skirt girls sleeveless airy weave elasticsation around neckline elasticsation seam waist flare vertical flounce round asymmetric hem line
alfons dress garment full body solid light pink dusty young girl children size baby skirt girls chiffon wide neckline small open button back neck length flounce sleeves elasticsation seam waist line
```

Figure 15: Bert query recommendation

```
ts: Results using df_all + cust_q:
with query: pink skirt flowers skirt pink skirt flowers skirt pink skirt flowers skirt pink skirt flowers skirt pink skirt flowers skirt pink skirt flowers skirt
marja sequins dress garment full body sequin light pink kid girl children size baby skirt girls sleeveless line weave fabric reversible front normal round neckline open button
marja sequins dress garment full body sequin pink bright kid girl children size baby skirt girls sleeveless line weave fabric reversible front normal round neckline open button
dolly dress garment full body solid light pink dusty kid girl jersey fancy children size baby cotton print motif reversible sequins front normal elasticsation seam waist decorative
cleo sleeveless dress garment full body pattern light pink kid girl children size baby skirt girls shirt soft cotton weave collar button placket chest pocket side detachable
fun fleece set hat beanie accessories front print light pink dusty kid girl big acc children swimwear baby outerwear mittens soft motif appliques top ear flap rib cuff line
marja sequins dress garment full body sequin light pink kid girl children size baby skirt girls sleeveless mesh embroidery reversible normal open button back neck line
```

Results using df\_all:  
christmas calendar accessories solid white light jewellery ladies ladieswear womens small advent paper gold colour print motifs satin ribbon hang windows contain different

Figure 16: past purchases + query recommendation



## EXPERIMENT #6:

Query	Result from tf-idf	Result from bert query	Result from bert query and past purchases	Comparison between results
Black vest top women upper	they were all for the upper body parts and 6 of them were vests and all of them were back	8 out of 10 were relevant so that's good	2 out of 10 returned were vests, while the others were jumpsuits and black	bert query Tf-idf Then bert and past purchases

Figure 17: Experiment 6 observations

[illegible]

Figure 18: past purchases + query recommendation

## EXPERIMENT #7:

Arabic Query:	<input type="text" value="Type Arabic query here"/>
Translate Arabic to English	
English Que...	<input type="text" value="Blue blazer ladieswear with button"/>
Query recommendation BERT	
Past Purchase recommendation BERT	
Query and past purchase recommendation BERT	
Show past purchase for customer	
result with tfidf	
result with count vectorizer	
result with knn	
Display Top 10	
Display Comparison	

Figure 19: query 7 interface



Query	Result from tf-idf	Result from bert query	Result from bert query and past purchases	Comparison between results
Blue blazer ladieswear with buttons	It was perfect and returned bunch of blue blazers with buttons	Less results with buttons from the tf-idf model. Some products were retrieved but they were non-relevant	I didn't find the best options because my past purchases didn't have any blue or blazer items So it recommended me blue tops but not blazers	The best one was tfidf Then bert query Then bert and past purchases

Table 7 :experiment 7 observations

Results: Results using df\_all:  
with query: blue blazer button ladieswear  
terrier blazer garment upper body solid black dark suit ladieswear womens tailor dress short gently fit jacket cr pe weave button chain fasten front line  
mariette blazer garment upper body solid dark blue suit ladieswear womens tailor dress fit jacket weave fabric notch lapels jet front pocket decorative button cuff single back vent line  
mariette blazer garment upper body solid grey dusty light suit ladieswear womens tailor dress fit jacket weave fabric notch lapels jet front pocket decorative button cuff single back vent line  
mariette blazer garment upper body solid red medium dusty suit ladieswear womens tailor dress fit jacket weave fabric notch lapels jet front pocket decorative button cuff single back vent line  
mariette blazer garment upper body solid light grey dusty suit ladieswear womens tailor dress fit jacket weave fabric notch lapels jet front pocket decorative button cuff single back vent line  
ariella blazer garment upper body stripe dark yellow suit jacket ladieswear womens everyday collection dress textured cotton blend peak lapels button front welt pocket long sleeves decorative cuff line  
mariette blazer garment upper body solid black dark suit ladieswear womens tailor dress fit jacket weave fabric notch lapels jet front pocket decorative button cuff single back vent line  
mariette blazer garment upper body solid white light suit ladieswear womens tailor dress fit jacket weave fabric notch lapels jet front pocket decorative button cuff single back vent line  
mariette blazer garment upper body solid dark grey suit ladieswear womens tailor dress fit jacket weave fabric notch lapels jet front pocket decorative button cuff single back vent line  
mariette blazer garment upper body solid dark green medium dusty suit ladieswear womens tailor dress fit jacket weave fabric notch lapels jet front pocket decorative button cuff single back vent line

Results using df\_all:

Figure 20: Bert query recommendation

Results tfidf query:  
with query: blue blazer ladieswear button  
terrier blazer garment upper body solid black dark suit ladieswear womens tailor dress short gently fit jacket cr pe weave button chain fasten front line  
ariella blazer garment upper body stripe white light suit jacket ladieswear womens everyday collection dress textured cotton blend peak lapels button front welt pocket long sleeves decorative cuff line  
ariella blazer garment upper body stripe dark yellow suit jacket ladieswear womens everyday collection dress textured cotton blend peak lapels button front welt pocket long sleeves decorative cuff line  
valkyria blazer garment upper body solid black dark suit ladieswear womens tailor dress gently fit jacket cr pe weave notch lapels button front flap pocket length sleeves gather single back vent line  
day blazer garment upper body solid black dark suit ladieswear womens tailor dress fit collarless jacket linen blend welt front pocket length sleeves gather button  
mariette blazer garment upper body solid black dark suit ladieswear womens tailor dress fit jacket weave fabric notch lapels jet front pocket decorative button cuff single back vent line  
nikki blazer garment upper body solid black dark suit ladieswear womens tailor dress jacket weave fabric shawl collar pocket side seam length gather sleeves fasteners line  
capri blazer garment upper body solid black dark suit ladieswear womens everyday collection dress straight cut weave fabric notch lapels button front welt pocket flap decorative cuff line  
donna blazer garment upper body solid light pink dusty suit ladieswear womens tailor dress fit jacket weave fabric conceal hook eye fasten front flap pocket gather length sleeves line

Figure 21: tf-idf recommendation



day blazer garment upper bod



Figure 22: pictures returned from experiment 7

## EXPERIMENT #8:

Query	Result from tf-idf	Result from Bert query	Result from Bert query and past purchases	Comparison between results
Purple leggings cotton lower body	All Relevant, 5 are cotton but not purple	Perfect results all of them were relevant, they were all tights and leggings. 3 of them were cotton and the remaining were jersey but not purple too.	Got back 5 results with leggings which is very good. The remaining things were cotton too	Tf-idf Bert Query Bert Query with past purchases

Table 8: experiment 8 observations

Results using df\_all + cust\_g:  
with query: purple leggings cotton lower body  
manchester rib jumpsuit pyjama playsuit nightwear solid light grey dusty lingerie tights ladieswear womens sock tigh sleeveless cotton jersey narrow adjustable shoulder strap elasticated seam drawstring waist over:  
dolly set pyjama nightwear stripe light pink dusty lingerie tights ladieswear womens sock tigh pyjamas soft viscose weave short neck top adjustable flounce trim shoulder strap elasticated waist  
olga pyjama set nightwear front print dark red lingerie tights ladieswear womens sock tigh pyjamas oversized top sweatshirt fabric pair leggings jersey drop shoulder long sleeves rib around neckline cuff h  
gala jumpsuit bridal pyjama playsuit nightwear solid light beige dusty lingerie tights ladieswear womens sock tigh softly drape satin lace trim neck front back narrow adjustable shoulder strap deep armholes side p  
dolly set pyjama nightwear stripe light blue lingerie tights ladieswear womens sock tigh pyjamas soft viscose weave short neck top adjustable flounce trim shoulder strap elasticated waist  
olga pyjama set nightwear front print dark blue lingerie tights ladieswear womens sock tigh pyjamas soft cotton blend long sleeved top sweatshirt fabric longer style rib around neckline cuff hem leggings pattern j  
doris set leggings tights garment lower body structure dark beige kid girl knitwear children size baby hoodie soft fine rib knit viscose blend long sleeved cuff hem skinny fit easy pull elasticated waist  
rodeo jumpsuit playsuit garment full body solid white dusty light trouser ladieswear womens everyday collection trousers sleeveless ankle length sturdy cotton twill adjustable shoulder strap button top patch front j  
olga pyjama set nightwear front print light pink dusty lingerie tights ladieswear womens sock tigh pyjamas soft cotton blend long sleeved top sweatshirt fabric longer style rib around neckline cuff hem leggings pa

Figure 23: past purchased + Bert recommendation

Results using df\_all:  
with query: purple leggings cotton lower body  
long leggings petite tights garment lower body solid black dark jersey basic ladieswear womens everyday basics soft cotton  
seamless leggings plain tights garment lower body solid black dark basic lingerie ladieswear womens nightwear sock tigh high waisted jersey wide waist panel design minimum number seam comfortable fit increase mobi  
pola seamless leggings tights garment lower body solid black dark jersey basic ladieswear womens everyday basics high waisted microfibre wide waist panel design minimum number seam comfortable fit increase mobility  
pola seamless leggings tights garment lower body solid black dark jersey basic ladieswear womens everyday basics high waisted microfibre wide waist panel design minimum number seam comfortable fit increase mobility  
fleece leggings tights garment lower body solid black dark basic lingerie ladieswear womens nightwear sock tigh opaque soft thermal inside elastication waist hem  
pirate leggings pack tights garment lower body solid black dark jersey basic ladieswear womens everyday basics length stretch elasticated waist  
glossy leggings tights garment lower body solid black dark basic lingerie ladieswear womens nightwear sock tigh opaque jersey sheer elasticated waist  
luxe leggings tights garment lower body glitter metallic black dark basic lingerie ladieswear womens nightwear sock tigh contain glittery thread elasticated waist  
basic leggings crop tights garment lower body solid black dark jersey ladieswear fancy length elasticated waist  
long leggings tights garment lower body solid black dark jersey basic ladieswear womens everyday basics make cotton blend elasticated waist content organic

Figure 24: Bert recommendation

## EXPERIMENT #9:

Query	Result from tf-idf	Result from Bert query	Result from Bert query and past purchases	Comparison between results
dress sleeveless pink dress full body	the results were very relevant, all were dresses and all pink	All returned items were dresses , most of them were pink, 6 of them were sleeveless	Four of them were relevant, and some of them were pink. The other results were not dresses but sleeveless tops	Tf-idf Bert Query Bert Query with past purchases

Table 9: experiment 9 observations

## EXPERIMENT #10:

Arabic Query:

Translate Arabic to English

English Que...

Query recommendation BERT

Past Purchase recommendation BERT

Query and past purchase recommendation BERT

Show past purchase for customer

result with tfidf

result with count vectorizer

result with knn

Display Top 10

Display Comparison

Figure 25: query 10 interface

Query	Result from tf-idf	Result from Bert query	Result from Bert query and past purchases	Comparison between results
حلّق ذهبي صغير	Perfect results all of them were relevant, it had a variety of earrings types with multiple materials	First three Results were perfect but after that I got some non-relevant ones such as small bag but gold so it caught two words of the query	It brought back accessories but Not earrings , and the past purchases had no earrings in . so maybe because of that	Tf-idf  Bert Query  Bert Query with past purchases

Table 10: experiment 10 observations

I got these relevant pictures but lots of non-relevant pictures too.



Figure 26: earrings from query using Bert



*Figure 27: earrings from using tf-idf*

## EXPERIMENT #11:

Query	Result from tf-idf	Result from bert query	Result from bert query and past purchases	Comparison between results
شنطة للظهر سودا	Very good results, all of them were relevant, the first 9 of 10 were black so that's super good	It was pretty good with all relevant results too	The first 5 results were relevant but the others were not but had the black color in common	Tf-idf BertQuery PastPurchases+BertQuery

Table 11: experiment 11 observations



Figure 28: pictures returned from exp 11



Figure 29: pictures returned from exp 11

## EXPERIMENT #12:

Query	Result from tf-idf	Result from bert query	Result from bert query and past purchases	Comparison between results
children white beanie accessories	All were relevant with different	It was pretty good with all relevant results. All of them were beanies with white and light colors.	5 of the results were considered as relevant because I had past purchases that is similar to what I searched for	Tf-idf Bert Query Bert Query + past purchases

Table 12: experiment 12 observations

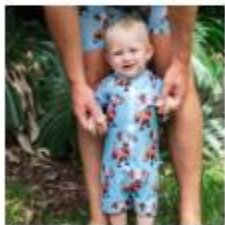


Figure 30: pictures returned from experiment 12



[illegible]

Results: rib around neckline cuff hem scallop sock sock rock tights glitter metallic black dark black ~~shobak~~ sock ~~lingeries~~ ~~lingeries~~ nightwear ~~sock~~ ~~high~~ sock tights finge knit sock scallop edge sca light white jersey basic ladieswear ladieswear women casual black dark light beige jersey round hem slightly longer bra titty shirt body solid white light white jersey basic ladies sleeveless dress cr pe weave neck small stand collar gather shoulder seam tie waist line nova dress garment full body pattern black dark ladieswear ladieswear women tailor dress ladies sl dress cr pe weave neck small stand collar gather shoulder seam tie waist line nova dress garment full body stripe white dusty light white dress ladieswear ladieswear women tailor dress ladies sleeveless d jacket weave fabric nont lapels welt front pocket flap fasteners line jazz blouse garment upper body stripe dark green dark green blouse ladieswear ladieswear women tailor blouse ladies sleeveless st leggings sturdy jersey elasticated waist dress garment full body pattern black dark black ladieswear ladieswear women everyday clothing dress ladies short skirt dress weave fabric round short jersey dress round neckline drop shoulder short sleeves pattern sock sock tights pattern light grey dusty light grey shobakack sock lingerie tights ladieswear women nightwear sock tights tig blend basic hood hoodie garment upper body front print light yellow bright yellow jersey ladieswear ladieswear women casual jersey fancy top sport sweatshirt fabric text print motif jersey line drawstring ho light white cuff hem soft brush inside ~~gala~~ blouse garment upper body solid yellow medium dusty yellow blouse ladieswear ladieswear women tailor blouses blouse soft weave narrow collar conceal button front lon strap round short jersey short sleeves pattern black dark black ladieswear ladieswear women casual jersey tunic crinkle cotton weave embroidery neck tie neckline lengths sleeves round hem slightly longer black ~~dangle~~ hood hoodie garment upper body neckline cuff hem orbit hotpants short garment lower body solid dark grey dark grey ladies sport bottom sport sport ladies sport jersey fancy short sports tights fast dry functional fabric weave waistband con shoulder black round hem slightly longer black ven shell top blouse garment upper body pattern light yellow light yellow ladies top ladieswear ladieswear blouses short sleeved blouse viscose cr pe weave open co

[illegible]

Results:	Results using cust_q: with query:
	<p>cezanee set garment full body check dark blue baby boy weave size children jersey knit mix long sleeved shirt waistcoat bow tie pair trousers cotton button collar front cuff lightly brush back make line fa</p> <p>cezanee set garment full body stripe dark grey medium dusty baby boy weave size children jersey knit mix long sleeved shirt waistcoat bow tie pair trousers cotton button collar front cuff lightly brush bac</p> <p>cezanee waistcoat set garment full body check black dark baby boy weave size children jersey knit mix long sleeved shirt bow tie pair trousers cotton button front cuff lightly brush adjustable elastic str</p> <p>gala jumpsuit bridal pyjama playsuit nightwear solid light beige dusty lingerie ties ladieswear womens sock high softly drape satin lace trim neck front bar narrow adjustable shoulder strap deep armhol</p> <p>manchester rib jumpsuit pyjama playsuit nightwear solid light grey dusty lingerie ties ladieswear womens sock high sleeved cotton jersey narrow adjustable shoulder strap elasticated seam drawstring w</p> <p>vea pcs gift set garment full body front print light pink dusty newborn baby size children essentials complement jersey fancy long sleeved bodysuit pair leggings one pyjamas shirt hat soft organic cotton</p> <p>bahamas jumpsuit playsuit garment full body stripe light blue trouser ladieswear womens everyday collection trousers weave fabric wide flounce trim shoulder strap sock bodice elastication small roll top</p> <p>rodeo jumpsuit playsuit garment full body solid white dusty light trouser ladieswear womens everyday collection trousers sleeveless ankle length sturdy cotton twill adjustable shoulder strap front top pat</p> <p>dolly set pyjama nightwear stripe light pink dusty lingerie ties ladieswear womens sock high pyjamas soft viscose weave short neck top adjustable flounce trim shoulder strap elasticated waist</p> <p>dolly set pyjama nightwear stripe light blue lingerie ties ladieswear womens sock high pyjamas soft viscose weave short neck top adjustable flounce trim shoulder strap elasticated waist</p>

For a with customer id=” 001ae5408a043f64bccd32beffe2730151414cbdf18a6eb3cc8d30bdca605652”, the past purchased items had so much features in common with the ones recommended by the system. Both lists focused on items as nightwear sets highlighting comfort with the elasticated waists and soft materials. While also focusing on the same colors, it has been noticed that both lists had solid colors such as black, white, light grey and dark blue. Another matched feature was regarding the materials and fabrics which both lists had jersey and weave and its also registered in the testing report. For the upper body garment, both lists had tops and blouses with the focus on specific features as narrow shoulder straps and button fronts. For the lower body garments, both of them had trousers denim and joggers. Lastly, the full body garments were similar so both recommended jumpsuits, dresses and sets.