



# Optimisation de l'analyse clients

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# Projet Centre Commercial

Pourquoi étudier les clients d'un centre commercial ?

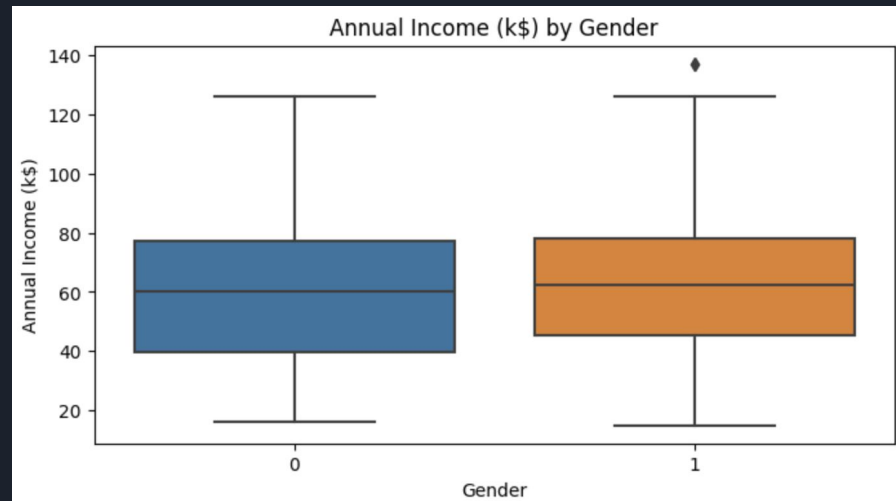
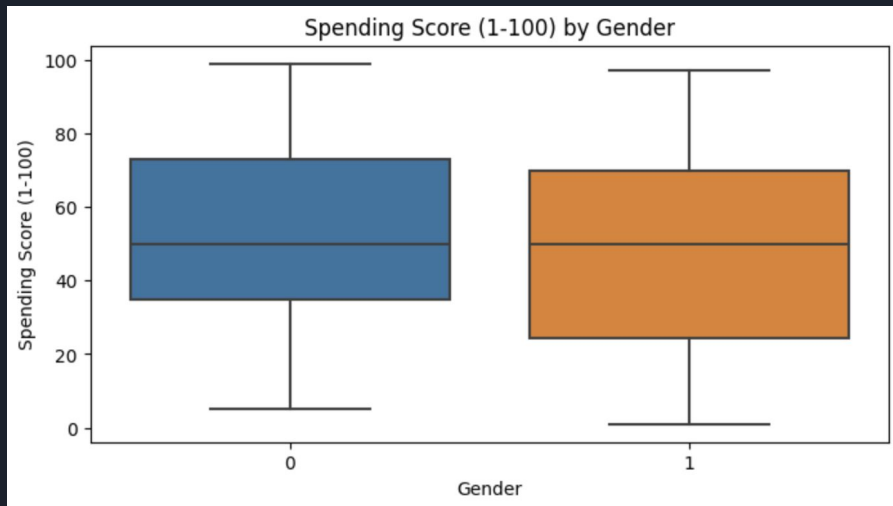


# Dataset

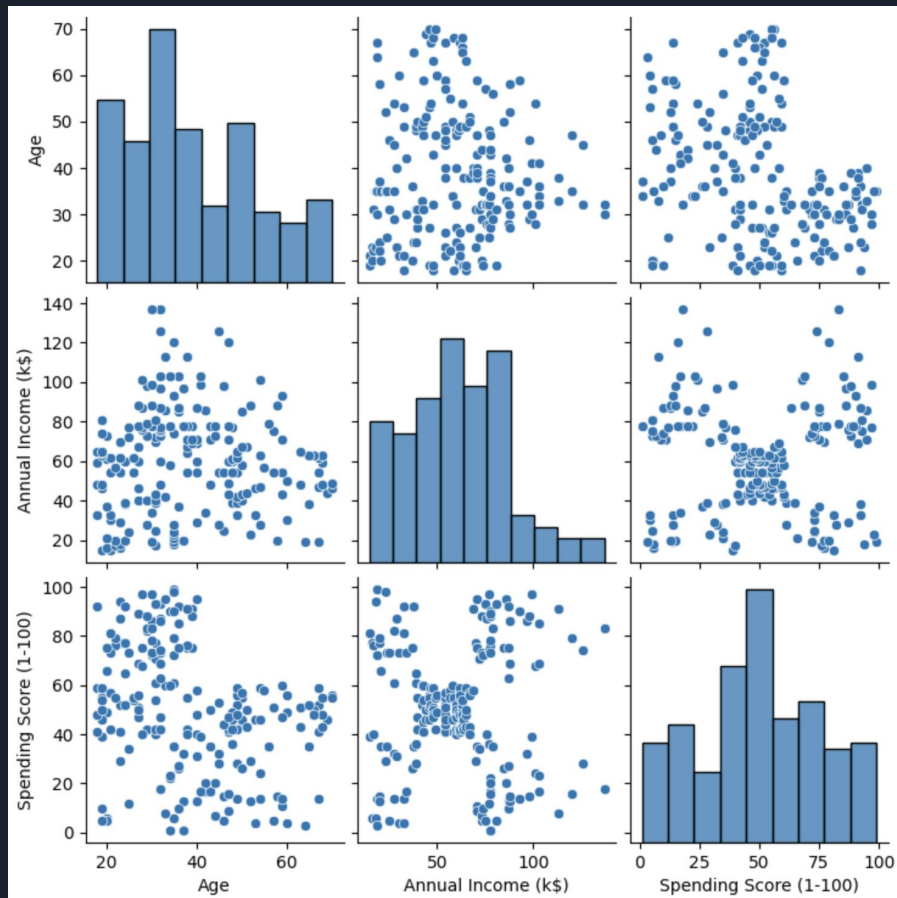
	<b>CustomerID</b>	<b>Gender</b>	<b>Age</b>	<b>Annual Income (k\$)</b>	<b>Spending Score (1-100)</b>
0	1	Male	19	15	39
1	2	Male	21	15	81
2	3	Female	20	16	6
3	4	Female	23	16	77
4	5	Female	31	17	40

200 entrées

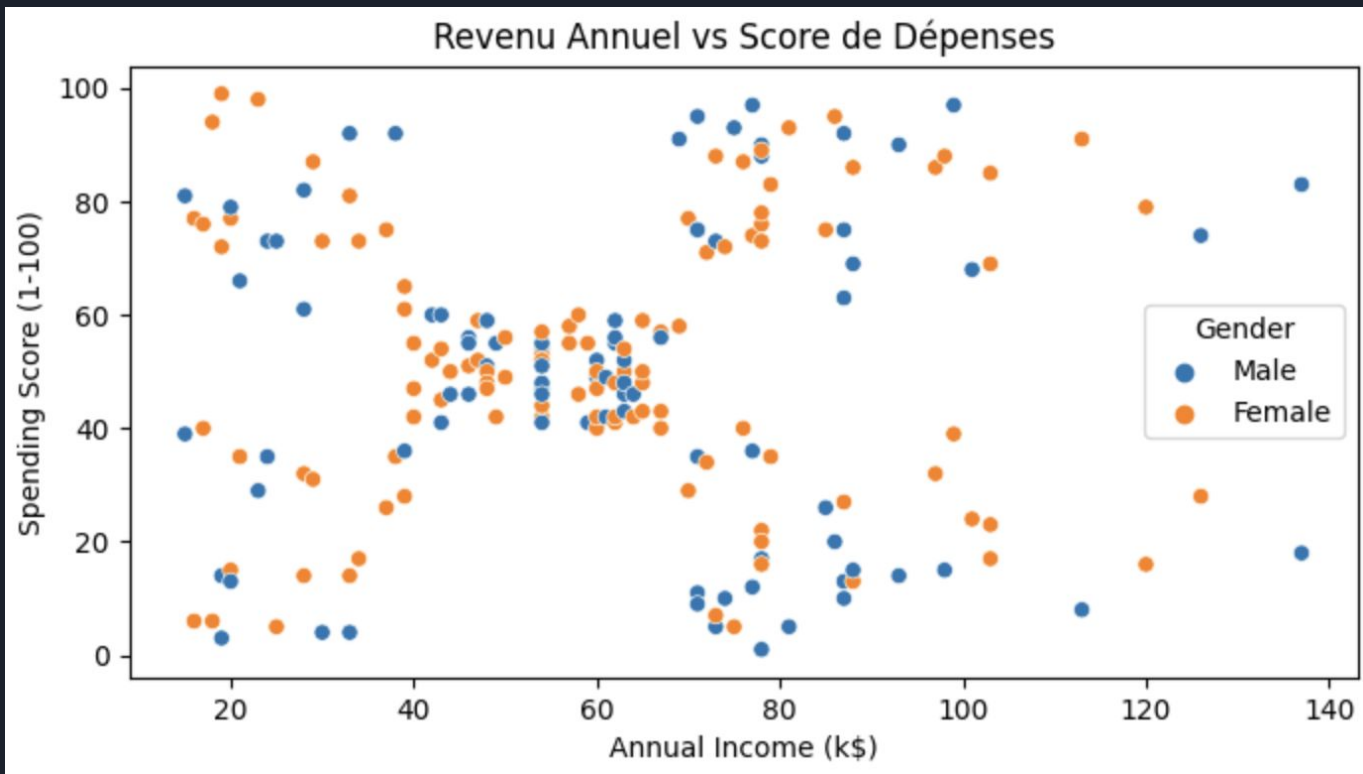
# EDA



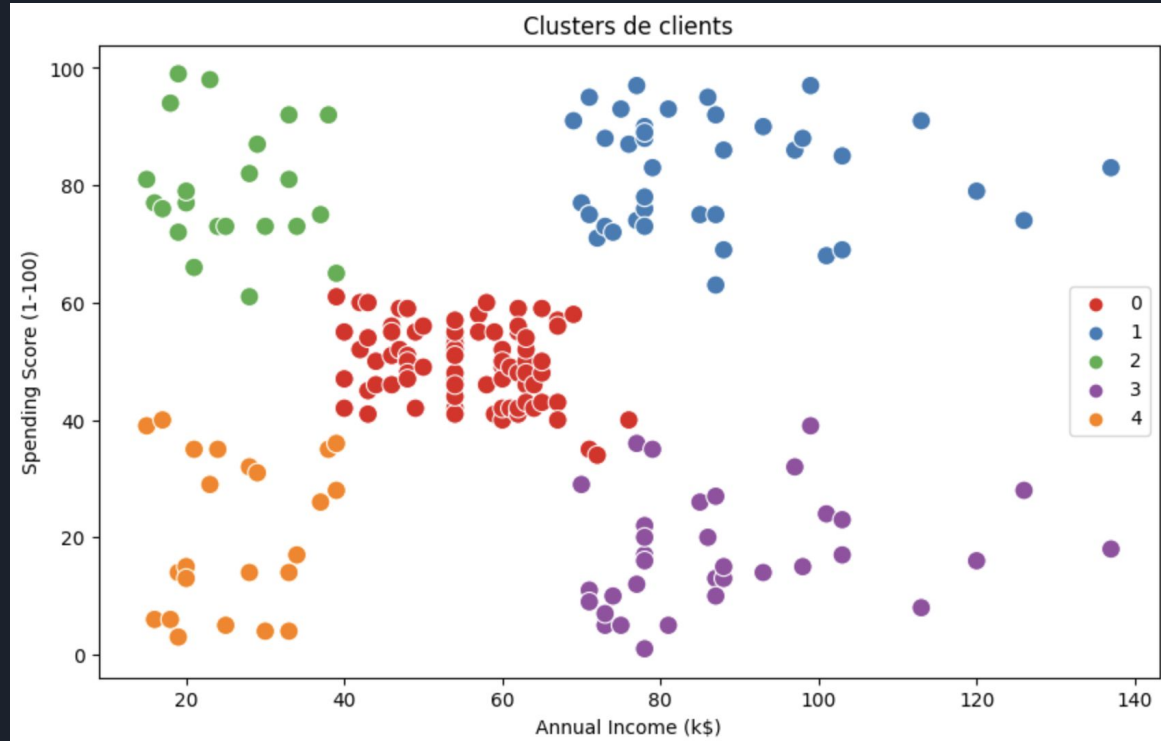
# EDA



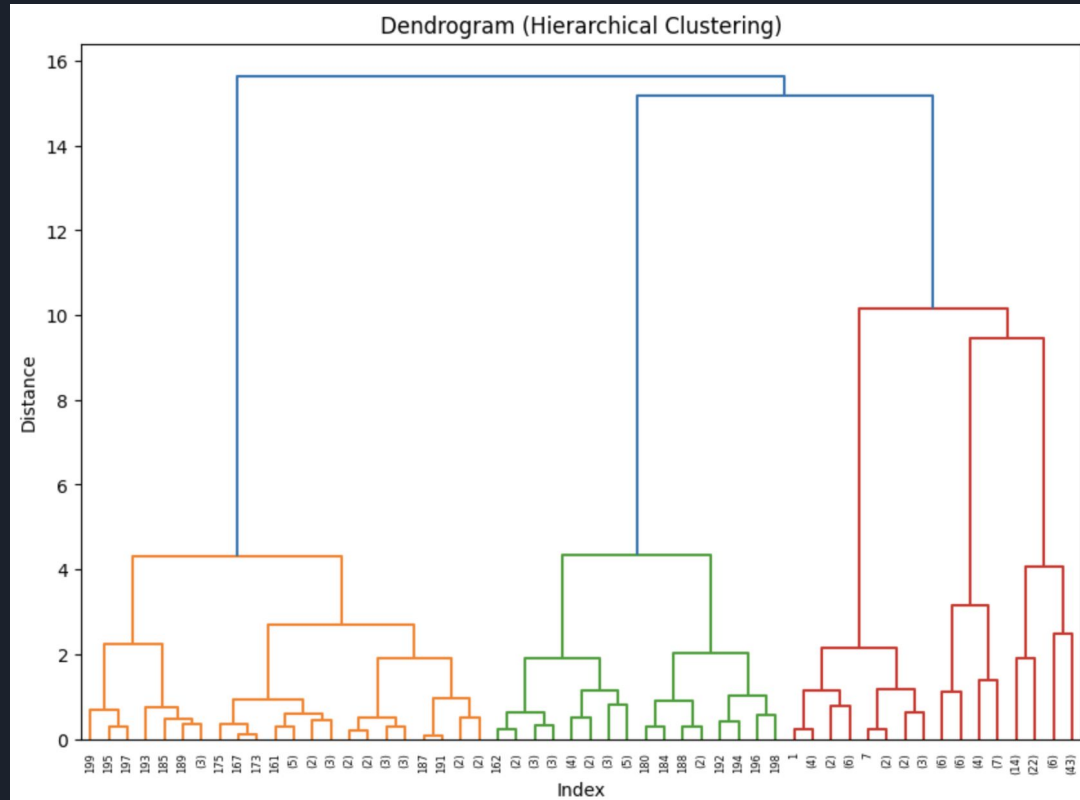
# EDA



# Clustering (Kmeans)

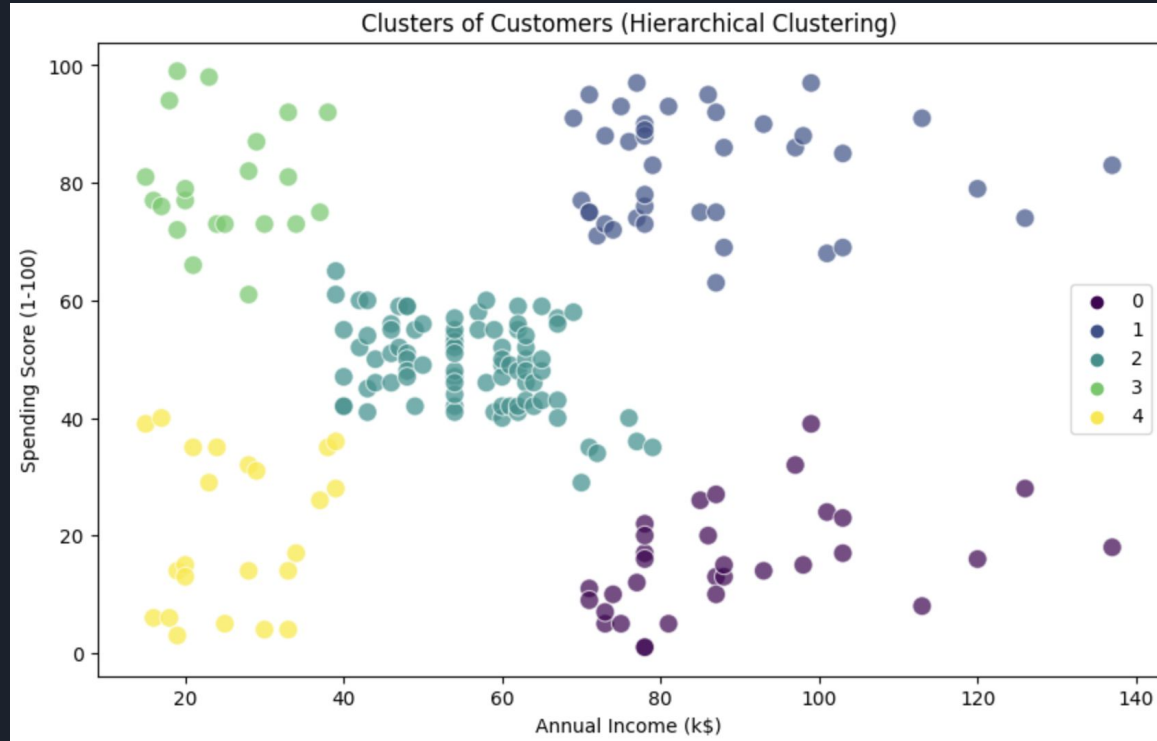


# Clustering (Hierarchical Clustering)

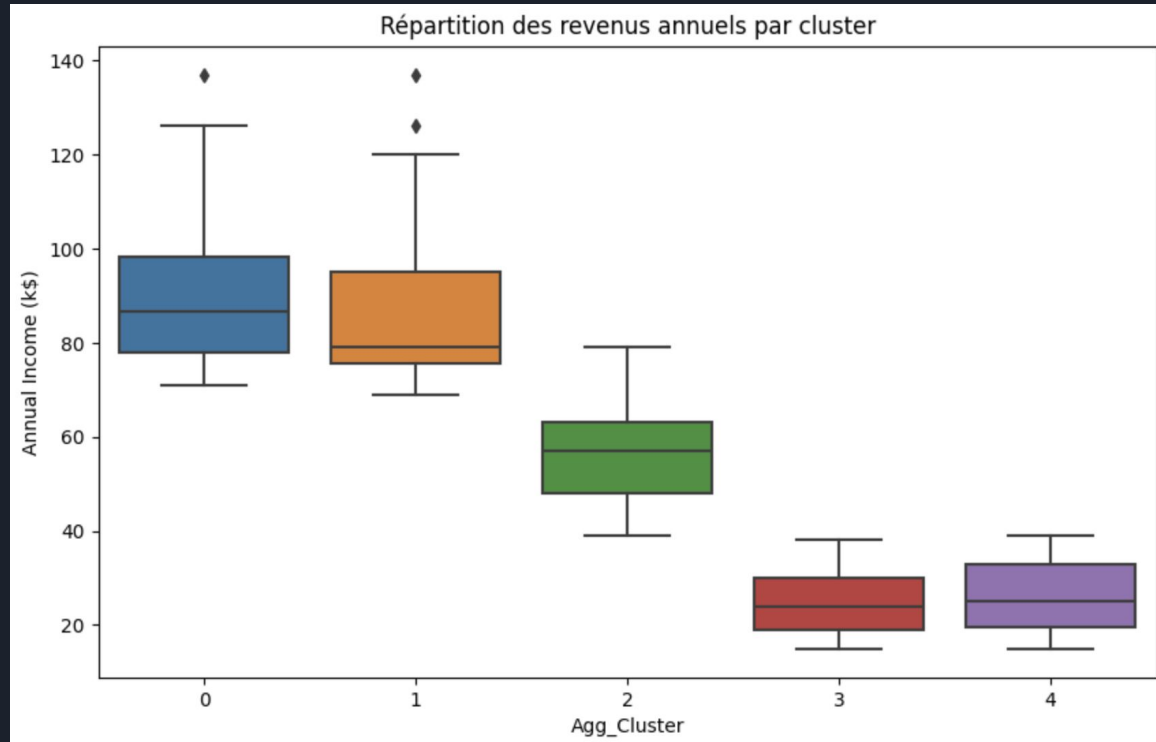




# Clustering (Hierarchical Clustering)



# Clustering





# Score Silhouette

Kmeans

0.5546571631111091

DBScan

0.35044619989666004

Hierarchical

0.5538089226688662

Time : 0.0045 seconds

Time : 0.0012 seconds



# Stratégies

Cluster 1: Faible revenu annuel et faible score de dépense. (Budget-Conscious Shoppers)

Stratégie: Offres promotionnelles et produits économiques pour attirer ces clients à faible revenu.

Cluster 2: Faible revenu annuel et score de dépense élevé. (Value Seekers)

Stratégie: Programmes de fidélité et récompenses pour maintenir leur engagement malgré leur faible revenu.

Cluster 3: Revenu annuel moyen et score de dépense moyen. (Middle-Class Consumers)

Stratégie: Produits de milieu de gamme et services de qualité pour satisfaire leurs besoins.

Cluster 4: Revenu annuel élevé et faible score de dépense. (Wealthy Savers)

Stratégie: Campagnes de marketing ciblées pour inciter à dépenser davantage, par exemple des offres sur des produits premium.

Cluster 5: Revenu annuel élevé et score de dépense élevé. (Affluent Spenders)

Stratégie: Produits haut de gamme et services exclusifs pour ces clients à fort potentiel de dépense.

# Campagne marketing

	ID	Year_Birth	Education	Marital_Status	Income	Kidhome	Teenhome	Dt_Customer	Recency	MntWines	MntFruits	MntMeatProducts	MntFishProducts
0	5524	1957	Graduation	Single	58138.0	0	0	04-09-2012	58	635	88	546	172
1	2174	1954	Graduation	Single	46344.0	1	1	08-03-2014	38	11	1	6	2
2	4141	1965	Graduation	Together	71613.0	0	0	21-08-2013	26	426	49	127	111
3	6182	1984	Graduation	Together	26646.0	1	0	10-02-2014	26	11	4	20	10
4	5324	1981	PhD	Married	58293.0	1	0	19-01-2014	94	173	43	118	46
5	7446	1967	Master	Together	62513.0	0	1	09-09-2013	16	520	42	98	0
6	965	1971	Graduation	Divorced	55635.0	0	1	13-11-2012	34	235	65	164	50
7	6177	1985	PhD	Married	33454.0	1	0	08-05-2013	32	76	10	56	3
8	4855	1974	PhD	Together	30351.0	1	0	06-06-2013	19	14	0	24	3
9	5899	1950	PhD	Together	5648.0	1	1	13-03-2014	68	28	0	6	1

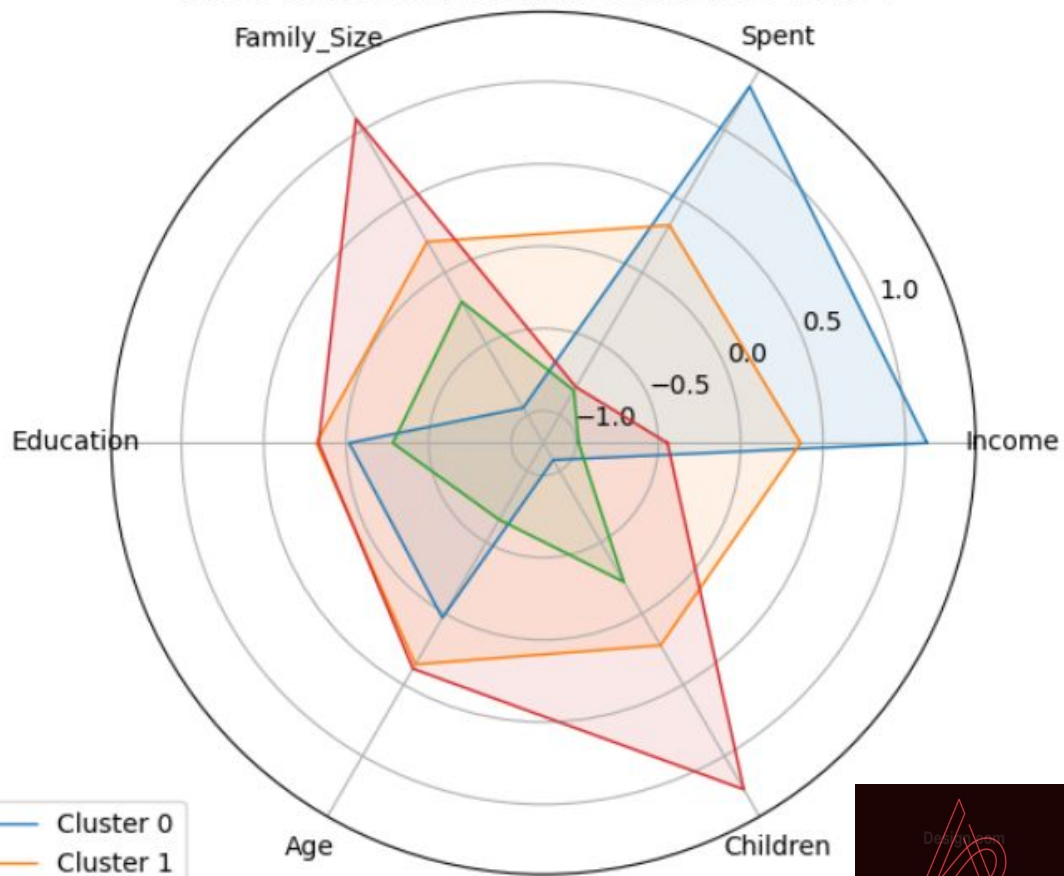
(2240, 29)



	Education	Income	MntWines	MntFruits	MntMeatProducts	MntFishProducts	MntSweetProducts	MntGoldProds	NumDealsPurchases	NumWebPurchases
0	1	58138.0	635	88	546	172	88	88	3	8
1	1	46344.0	11	1	6	2	1	6	2	1
2	1	71613.0	426	49	127	111	21	42	1	8
3	1	26646.0	11	4	20	10	3	5	2	2
4	2	58293.0	173	43	118	46	27	15	5	5

(2212, 22)

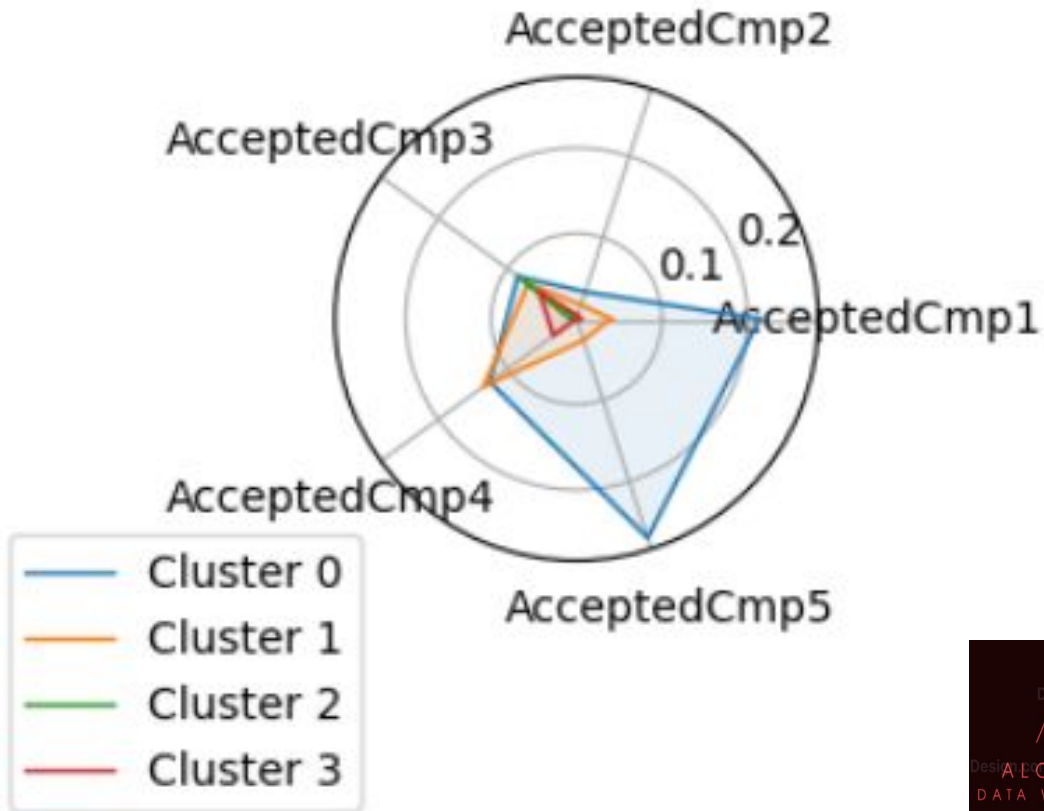
# ALOU PROD GRAPH MADE WITH ALOU SCRIPT



- Cluster 0
- Cluster 1
- Cluster 2
- Cluster 3

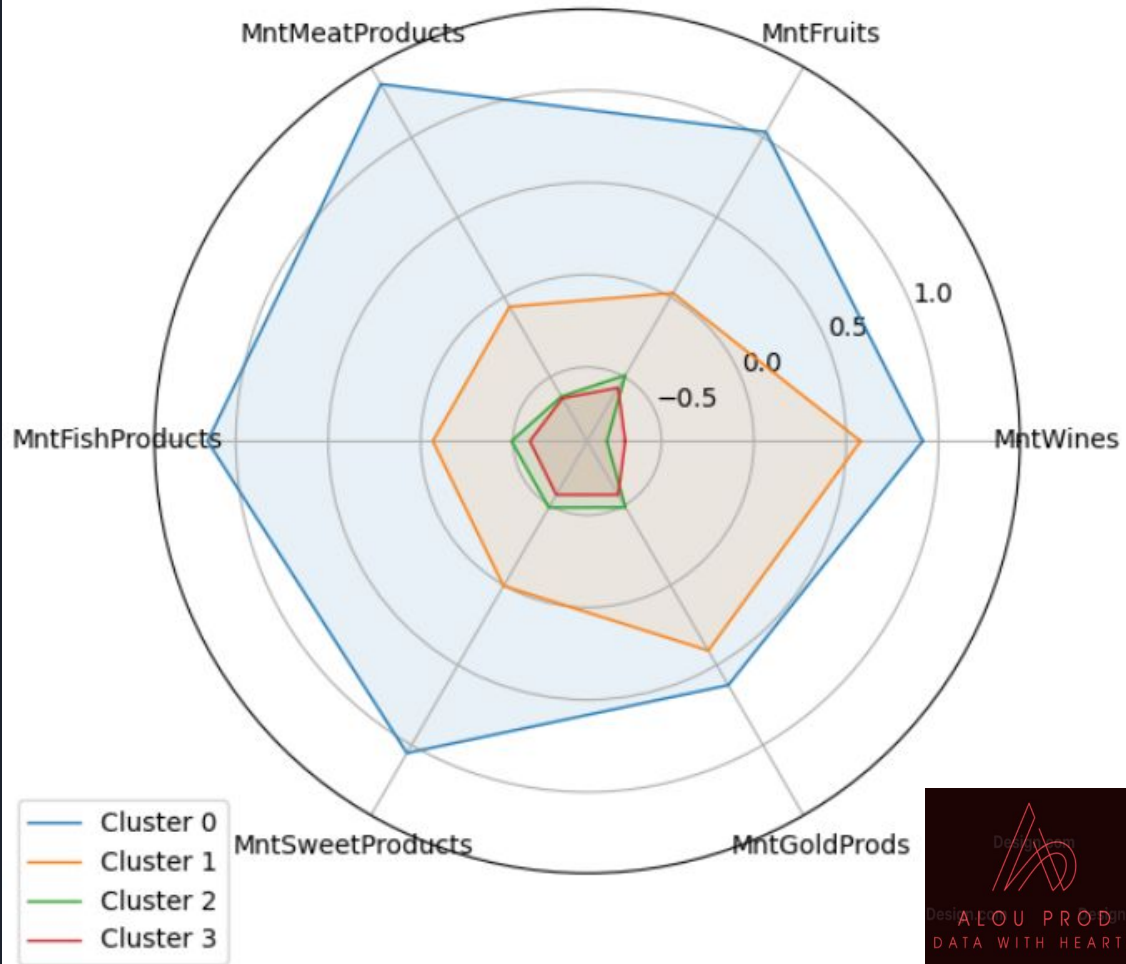


# ALOU PROD GRAPH MADE WITH ALOU SCRIPT



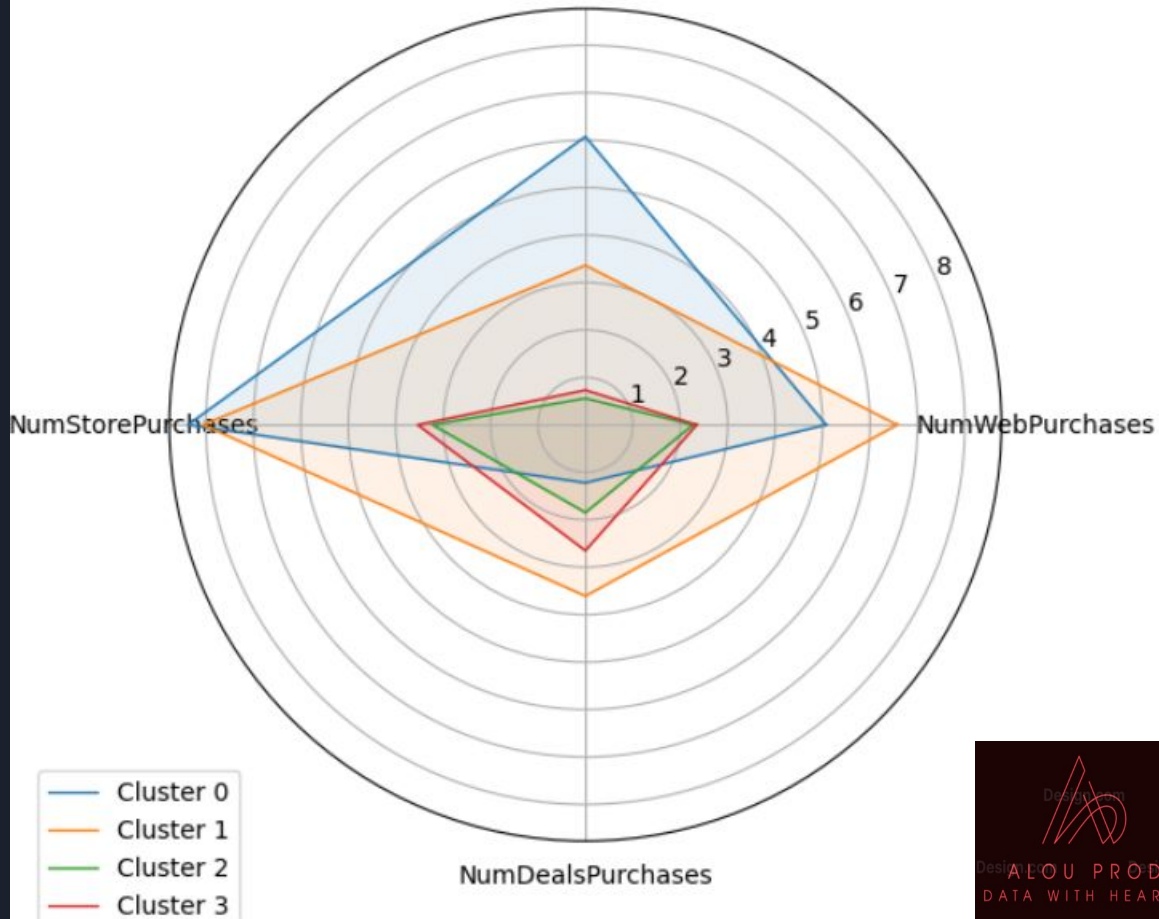


# ALOU PROD GRAPH MADE WITH ALOU SCRIPT



# ALOU PROD GRAPH MADE WITH ALOU SCRIPT

NumCatalogPurchases





Coeur de Cible:

Cluster 0/ Cluster 2/ Cluster 3

Recommendations :

Focus sur le Vin, Campagne  
3/4/5 a étudié et reproduire.

Bien être client.  
On aime nos petits vieux.



Bonus:

Cluster 1 + clientèle jeune

Recommendations:

Focus sur la partie Web du  
magasin, toutes les  
catégories alimentaires et  
les bons d'achats.

# Projet E-Commerce

Unnamed: 0		order_id	customer_id	order_status	order_purchase_timestamp	order_delivered_customer_d
0	0	e481f51cbdc54678b7cc49136f2d6af7	9ef432eb6251297304e76186b10a928d	delivered	2017-10-02 10:56:33	2017-10-10 21:25
1	1	e481f51cbdc54678b7cc49136f2d6af7	9ef432eb6251297304e76186b10a928d	delivered	2017-10-02 10:56:33	2017-10-10 21:25
2	2	e481f51cbdc54678b7cc49136f2d6af7	9ef432eb6251297304e76186b10a928d	delivered	2017-10-02 10:56:33	2017-10-10 21:25
3	3	53cdb2fc8bc7dce0b6741e2150273451	b0830fb4747a6c6d20dea0b8c802d7ef	delivered	2018-07-24 20:41:37	2018-08-07 15:27
4	4	47770eb9100c2d0c44946d9cf07ec65d	41ce2a54c0b03bf3443c3d931a367089	delivered	2018-08-08 08:38:49	2018-08-17 18:06
...	...	...	...	...	...	...
68989	68989	c19f4aa0a70f9b901b473677853e186c	cffb143b23ce7fed529c25d270de25a8	delivered	2018-05-19 13:20:10	2018-05-23 17:42
68990	68990	e747b099854432937d27178c640102bf	15cd6d28330a079fcdcd23372d2930c6	delivered	2017-09-27 09:20:53	2017-10-03 21:29
68991	68991	b3abe697965039908d3203cd063a2ce6	5feb65652220fea019c7efd7146849d4	delivered	2018-07-31 14:45:52	2018-08-02 14:08
68992	68992	3a69e8bb802e34036e7ef8f6e0f466ea	a73c6cbaa47b964449deabe357bbb8b0	delivered	2017-08-01 13:15:31	2017-08-09 19:00
68993	68993	dc43d5f57ffe55850a557219c	NaN	NaN	NaN	N

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 68993 entries, 0 to 68992
Data columns (total 21 columns):
 #   Column                                  Non-Null Count  Dtype
---  -
 0   Unnamed: 0                             68993 non-null  int64
 1   order_id                               68993 non-null  object
 2   customer_id                            68993 non-null  object
 3   order_status                           68993 non-null  object
 4   order_purchase_timestamp               68993 non-null  datetime64[ns]
 5   order_delivered_customer_date          66906 non-null  object
 6   payment_type                           68992 non-null  object
 7   payment_installments                   68992 non-null  float64
 8   payment_value                          68992 non-null  float64
 9   review_score                           68993 non-null  float64
10   customer_unique_id                     68993 non-null  object
11   customer_zip_code_prefix               68993 non-null  float64
12   customer_city                           68993 non-null  object
13   customer_state                         68993 non-null  object
14   product_category_name_english          67432 non-null  object
15   order_purchase_month                    68993 non-null  object
16   latest_purchase                        68993 non-null  datetime64[ns]
17   first_purchase                         68993 non-null  datetime64[ns]
18   FrequencyScore                         68993 non-null  int64
19   RecencyScore                           68993 non-null  int64
20   MonetaryScore                          68993 non-null  int64
dtypes: datetime64[ns](3), float64(4), int64(4), object(10)
memory usage: 13.6+ MB
```

# Création de la récence

	customer_unique_id	Recency
0	7c396fd4830fd04220f754e42b4e5bff	2454
4	af07308b275d755c9edb36a90c618231	2131
5	3a653a41f6f9fc3d2a113cf8398680e8	2116
6	7c142cf63193a1473d2e66489a9ae977	2379
7	72632f0f9dd73dfee390c9b22eb56dd6	2292
...	...	...
68988	f0fde3fb998d8abc99568ef7d8c4f82b	2356
68989	e6988cb9aa6f4782cb7e387c23763c50	2197
68990	a76755933c997e2d5a1cf81a3db71e8e	2431
68991	54c04569682d546b81f081b5b62a9d88	2124
68992	d2f3a7df276ec8d1dbe15b42c78a841d	2488



# Création de la fréquence

	customer_unique_id	Frequency
0	0000366f3b9a7992bf8c76cfd3221e2	1
1	0000f46a3911fa3c0805444483337064	1
2	0004aac84e0df4da2b147fca70cf8255	1
3	00053a61a98854899e70ed204dd4baf	1
4	0006fdc98a402fceb4eb0ee528f6a8d4	1
...	...	...
63679	fffb09418989a0dbff854a28163e47c6	1
63680	fffbf87b7a1a6fa8b03f081c5f51a201	1
63681	fffcc512b7dfecaafd80f13614af1d16	1
63682	fffea47cd6d3cc0a88bd621562a9d061	1
63683	ffff371b4d645b6ecea244b27531430a	1

# Création de la colonne monétaire

	customer_unique_id	MonetaryValue
19767	4fa4365000c7090fcb8cad5713c6d3db	0.00
37375	968fac81e2c44fb6c1e3ac2a45e6a102	0.00
32569	830d5b7aaa3b6f1e9ad63703bec97d23	0.00
47060	bd06ce0e06ad77a7f681f1a4960a3cc6	10.07
44600	b33336f46234b24a613ad9064d13106d	10.89
...	...	...
63476	ff4159b92c40ebe40454e3e6a7c35ed6	6726.66
17290	459bef486812aa25204be022145caa62	6922.21
54947	dc4802a71eae9be1dd28f5d788ceb526	6929.31
54398	da122df9eeddfedc1dc1f5349a1a690c	7571.63
2506	0a0a92112bd4c708ca5fde585afaa872	13664.08



# Création du RFM

customer_unique_id	first_purchase	latest_purchase	Recency	RecencyScore	Frequency	FrequencyScore	MonetaryValue	MonetaryScore	RFM
0000366f3b9a7992bf8c76cfd3221e2	2018-05-10	2018-05-10	2206	5	1	3	141.90	1	531
0000f46a3911fa3c0805444483337064	2017-03-10	2017-03-10	2632	2	1	3	86.22	1	231
0004aac84e0df4da2b147fca70cf8255	2017-11-14	2017-11-14	2383	3	1	3	196.89	1	331
00053a61a98854899e70ed204dd4baf6	2018-02-28	2018-02-28	2277	4	1	3	419.18	1	431
0006fdc98a402fceb4eb0ee528f6a8d4	2017-07-18	2017-07-18	2502	3	1	3	29.00	1	331
...	...	...	...	...	...	...	...	...	...
fff699c184bcc967d62fa2c6171765f7	2017-09-01	2017-09-01	2457	3	1	3	55.00	1	331
ffa431dd3fcdefea4b1777d114144f2	2017-10-30	2017-10-30	2398	3	1	3	81.20	1	331
fffb09418989a0dbff854a28163e47c6	2017-12-17	2017-12-17	2350	4	1	3	73.16	1	431
fffea47cd6d3cc0a88bd621562a9d061	2017-12-10	2017-12-10	2357	4	1	3	84.58	1	431
fff371b4d645b6ecea244b27531430a	2017-02-07	2017-02-07	2663	1	1	3	112.46	1	131



Merci à vous et à nos CEO !

