PRESENTATION

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LEGENDRE

ANALYZING U.S. MARKET CONSUMER SPENDING PATTERNS (2010S)

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THIS PROJECT AIMS TO EXPLORE HOW U.S. CONSUMER SPENDING EVOLVED DURING THE 2010S.

We will see in the presentation the evolution of the transaction volume and amount during the decade and as well the market segmentation.

To perform the analysis, and due the volume of data +13 million rows on the transaction table, I choosed Jupyter Notebook with the ***PySpark*** *library.*
I used the ***Extract – Transform – Load process*** *by connecting to the database (kaggle.com which contains millions available cases).*
Then during the ***Exploratory Data Analysis****, cleaned and transformed data into the right format* ***to prepare for analysis*** *to focus on the analysis objective.*
As the table ‚Merchant Category Codes' contains 109 unique codes, I grouped some categories to get the proper DataFrame (for technical reason – minimizing server resources, and for analytical reasons – optimizing the readiness)
The next step was ***the data visualization in order to discover clusters, trends and more.***
To do this, I have ***created line plots, scatter plots, heatmap and a segmentation market table.***
The the last step is ***my conclusion*** *to answer the aim of the analysis.*

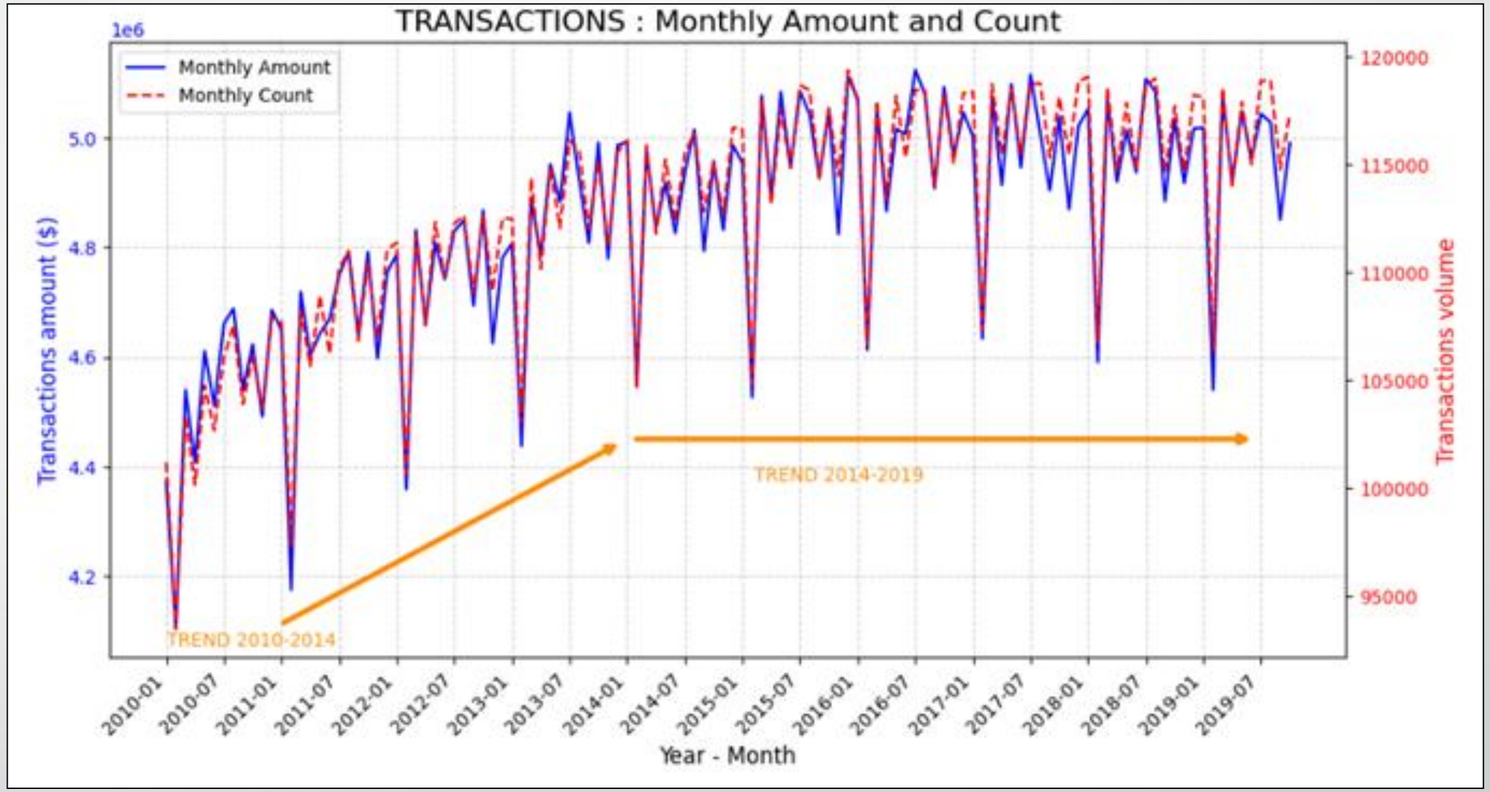
TRENDS

*Due to a big data volume in the transaction table, i used **PySpark, Pandas** and **Matplotlib** libraries for this analysis*

Observing the transaction amount exhibits a consistent trend since 2014; I included the transaction volume to confirm whether the change in trend is attributed to inflation.

The amounts and volume of transactions remain consistent, indicating that inflation is not the reason. Certain elements that might clarify the stabilization include:

Normalization of the monetary policy framework by the FED (Federal Reserve System)
Rise in the key rate since 2015 to dampen investments.



During the 2010/s decade, 2 main trends appears :

- ***Growth period : 2010 – 2014***
- ***Stable period : 2014 – 2019***

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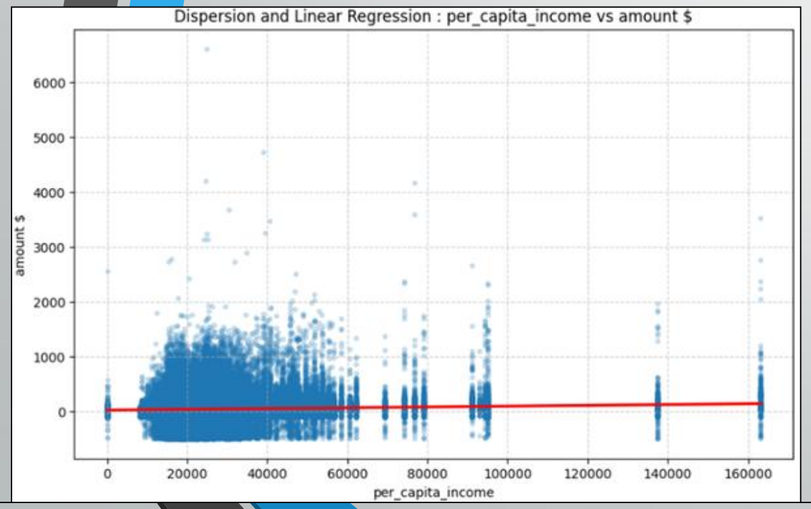
CLUSTERS

*To discover cluster, i used **scatter plots** using **Pandas** and **Seaborn** libraries.*

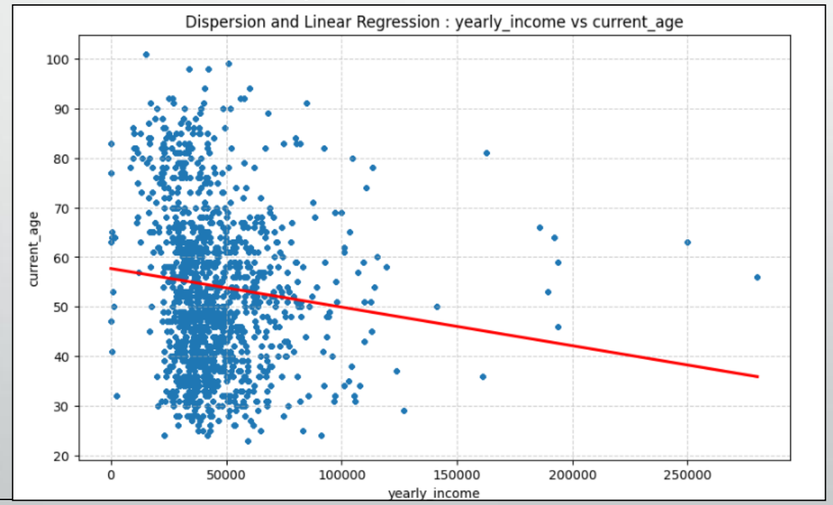
3 clusters shows a yearly income per person

- ***10K$ to 35K$***
- ***35K$ to 55K$***
- ***Above 55K$***

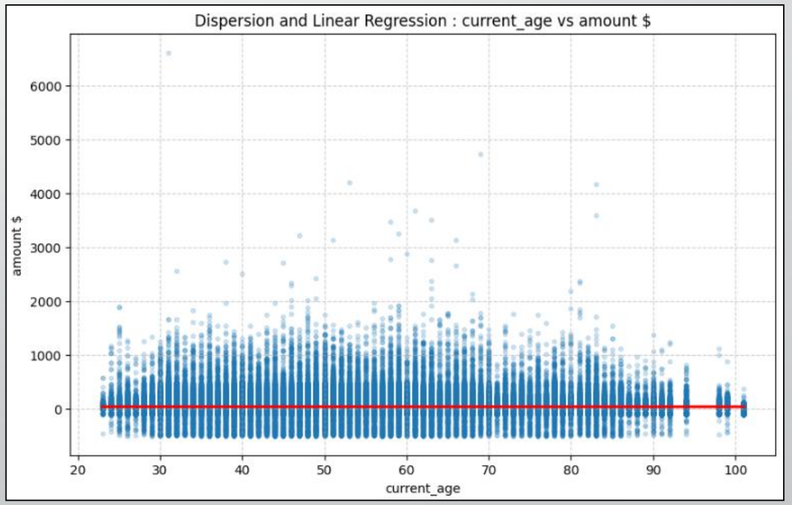


The graph typically displays an annual income ranging

- **25K$ to 50K$**
- **50K$ to 75K$**
- **Above 75K$**



Globally a transaction amount is up to 1k$



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HEATMAP

*The heatmap is done using **Seaborn** library*

*To **verify the market segmentation**, I have created a heatmap which shows the Average expenses by Category and split on the methodology payment (In person / On place and Online).*

The purpose was to verify if a trend will appear.

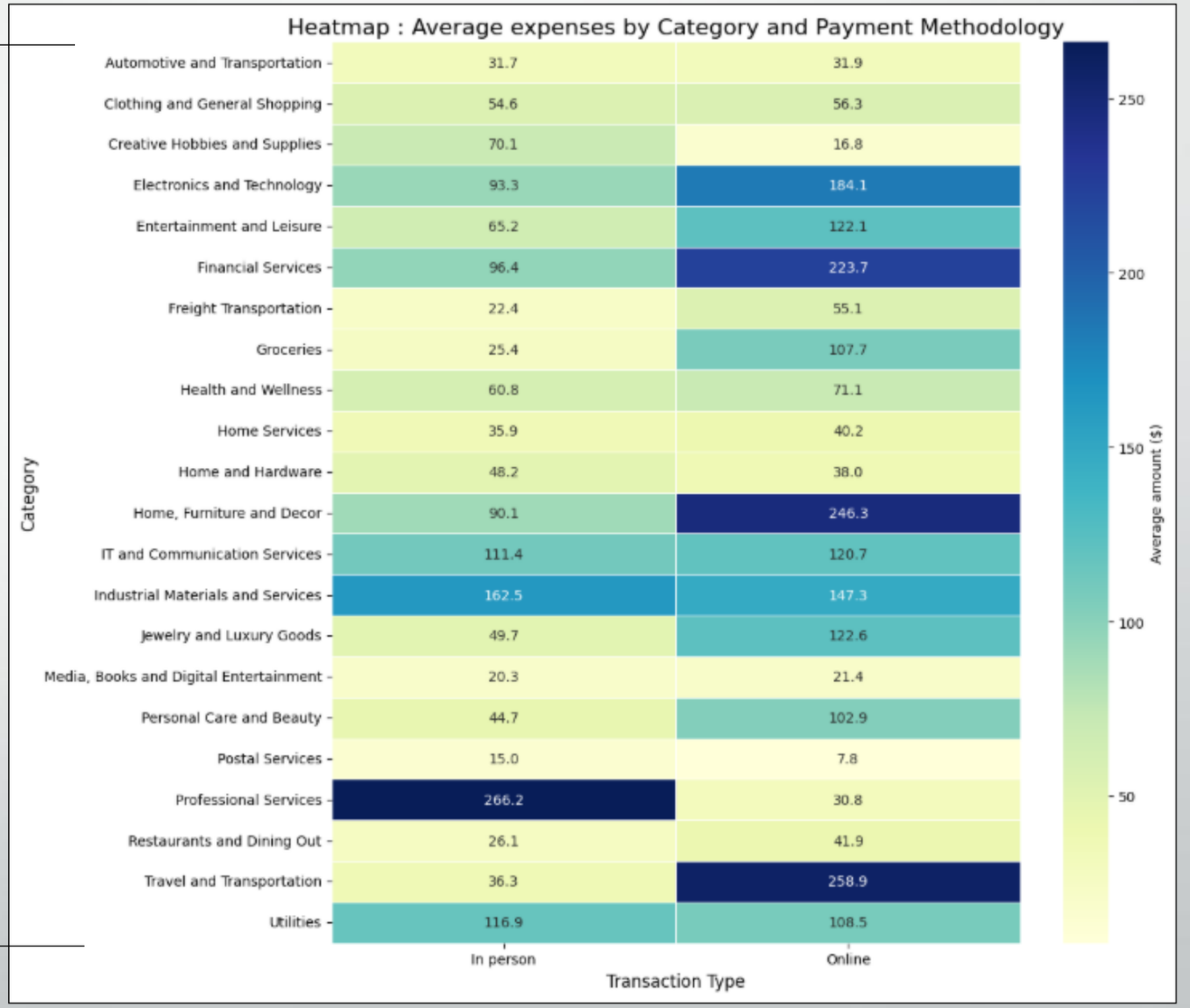
1. ***Professional Services are paid 'In person'.***
2. *For the categories below, transactions are mainly done **Online***

-> Travel and Transportation

-> Home, Furniture and Decor

-> Financial Services

-> Electronics and Technology



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GENDER & AMOUNT SEGMENT

*For this data manipulation **Pandas** was used*

*Further the previous segmentation, I **verified a there are others segments by gender**.*

- High potential categories / business :
  - **Travels** : category on which one people can afford to spend the highest
  - H**ealth / wellness / clothes / shopping** : people cares about themself and can afford to spend money on it
  - **Groceries** : with the highest volume of transaction.

- Overall , there are some distinctions based on gender:
  - **Men** : Media, Books, and Digital Entertainment
  - **Women** : Home Furniture, Decor, Clothing and Shopping

Market Segmentation - Sorted by Category (Max) and Gender):

Rank	Category	Gender	Max Amount ($)	Median Amount ($)	Transaction Count
1	Travel and Transportation	Female	$6,613.44	$183.00	2,594
1	Travel and Transportation	Male	$3,477.66	$174.48	2,568
2	Media, Books and Digital Entertainment	Male	$4,175.85	$11.38	15,184
2	Media, Books and Digital Entertainment	Female	$1,046.44	$13.32	15,717
3	Groceries	Male	$3,599.30	$12.42	183,853
3	Groceries	Female	$3,255.85	$12.18	195,378
4	Industrial Materials and Services	Female	$3,516.73	$179.93	6,286
4	Industrial Materials and Services	Male	$2,507.17	$180.01	6,002
5	Home, Furniture and Decor	Female	$2,378.21	$47.93	5,289
5	Home, Furniture and Decor	Male	$2,060.20	$47.14	4,741
6	Clothing and General Shopping	Female	$2,376.52	$42.87	44,325
6	Clothing and General Shopping	Male	$1,692.25	$42.12	40,001
7	Financial Services	Female	$2,345.04	$100.00	31,158
7	Financial Services	Male	$1,530.16	$80.00	32,790
8	Health and Wellness	Female	$2,340.51	$37.14	46,217
8	Health and Wellness	Male	$1,590.10	$37.58	42,396
9	Professional Services	Female	$1,893.02	$131.90	1,389
9	Professional Services	Male	$1,664.03	$50.56	1,321
10	Creative Hobbies and Supplies	Male	$1,761.58	$39.51	3,296
10	Creative Hobbies and Supplies	Female	$1,718.15	$40.92	3,771

CONCLUSION

HOW DID THE US MARKET EVOLVE DURING THE DECADE OF THE 2010S ?

- TREND : 2010 – 2014, the market trend of transaction amount was increasing and from 2014 until 2019, the trend is stable
- The standard amount spent for transactions is up to 1000 dollars / 1500 dollars

WHAT ARE THE MARKET SEGMENTS ?

- People are able to spend more on travelling and health / wellness / clothes / shopping
- Professional Services are paid 'in person' while the categories below are mainly done online:
  - Travel and Transportation
  - Home, Furniture and Decor
  - Financial Services
  - Electronics and Technology
- Groceries is the category with the highest volume of transactions.
- Depending on the category and gender, some trends are visibles.

- Then I will create an interactive dashboard in Power BI to share this conclusion.
- More inquiries arise following the examination:
  - What has contributed to the stability of the US market trend since 2014?
  - To address this new question, an alternative analysis can be carried out by examining the annual income progression by client_id to evaluate purchasing

THANK YOU