# Business Insight





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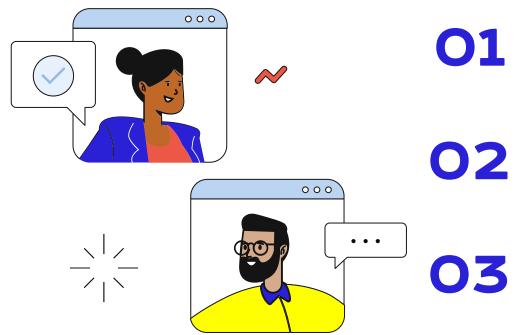
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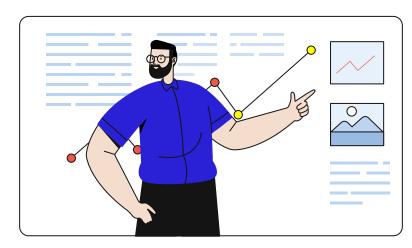
O2 Exploratory
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Business Insight



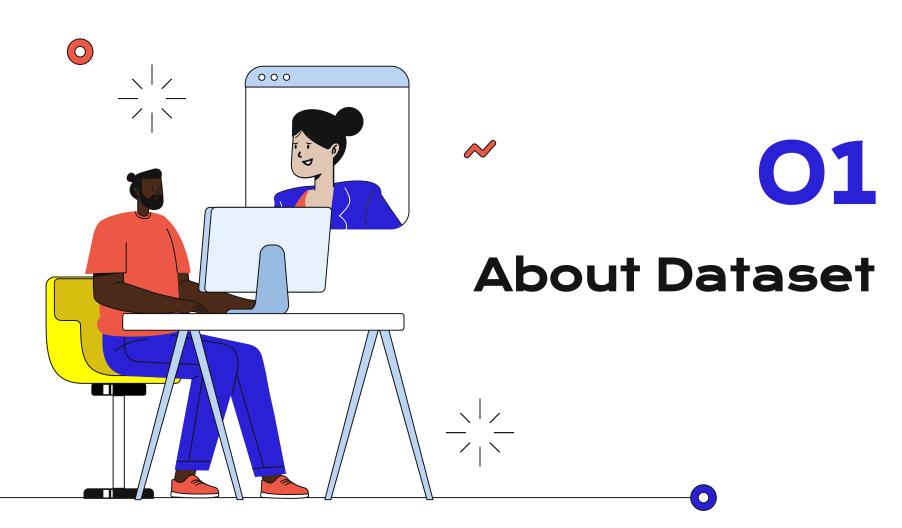


## MUHAMMAD IFZAL ASRIL









In this section I will briefly explain what this dataset contains and some information that is very important for the next section.



## what's in the dataset?



**Dataset Description:** 

The training dataset contains 2240 samples. Contains 28 features and 1 target boolean variable "Response":

#### 1. Accepted/Responses Campaign

- AcceptedCmp1 1 if customer accepted the offer in the 1st campaign, 0 otherwise
- AcceptedCmp2 1 if customer accepted the offer in the 2nd campaign, 0 otherwise
- AcceptedCmp3 1 if customer accepted the offer in the 3rd campaign, 0 otherwise
- AcceptedCmp4 1 if customer accepted the offer in the 4th campaign, 0 otherwise
- AcceptedCmp5 1 if customer accepted the offer in the 5th campaign, 0 otherwise
- Response (target) 1 if customer accepted the offer in the last campaign, 0 otherwise
- Complain 1 if customer complained in the previous 2 years

#### 2. Customer Information

- ID Customer's id
- Year\_Birth Customer's year of birth
- Education customer's level of education
- Marital customer's marital status
- Kidhome number of small children in customer's household
- Teenhome number of teenagers in customer's household
- Income customer's yearly household income
- DtCustomer date of customer's enrolment with the company
- Recency number of days since the last purchase





#### 3. Sales Product Type

- MntFishProducts amount spent on fish products in the last 2 years
- MntMeatProducts amount spent on meat products in the last 2 years
- MntFruits amount spent on fruits products in the last 2 years
- MntSweetProducts amount spent on sweet products in the last 2 years
- MntCoke amount spent on coke products in the last 2 years
- MntGoldProds amount spent on gold products in the last 2 years

#### 4. Number of Purchases per Type

- NumDealsPurchases number of purchases made with discount
- NumCatalogPurchases number of purchases made using catalogue
- NumStorePurchases number of purchases made directly in stores
- NumWebPurchases number of purchases made through company's web site
- NumWebVisitsMonth number of visits to company's web site in the last month

#### 5.Cost and Revenue

- Z\_CostContact = 3 (Cost to contact a customer)
- Z\_Revenue = 11 (Revenue after client accepting campaign)



# O2 ~ Exploratory Data Analysis





## Univariate Analysis

Univariate analysis explores each variable in a data set, separately. It looks at the range  $\nearrow$  of values, as well as the central tendency of the values.

## Multivariate Analysis

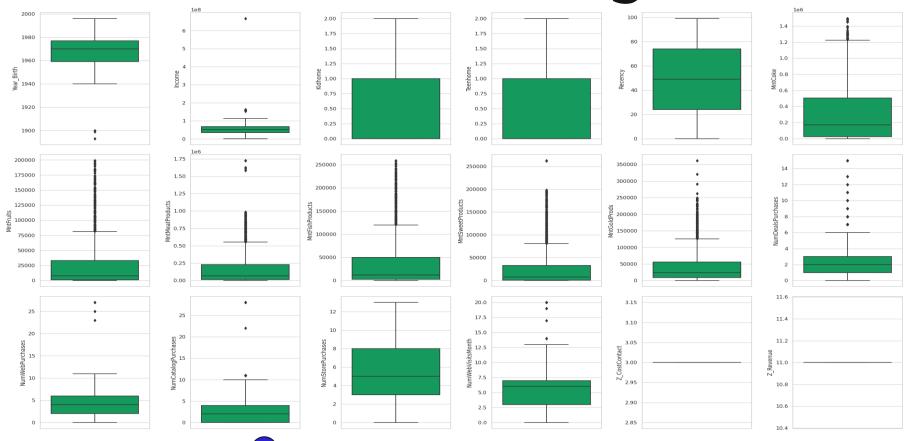


Multivariate analysis (MVA) involves evaluating multiple variables (more than two) to identify any possible association among them. Key takeaways: Multivariate analysis offers a more complete examination of data by looking at all possible independent variables and their relationships to one another.





# Univariate Analysis

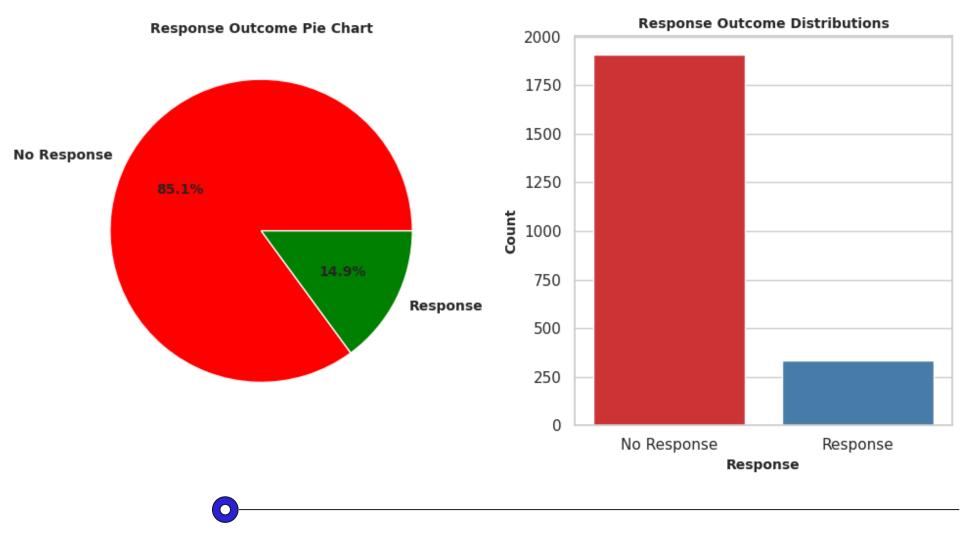


# Multivariate Analysis

| Year_Birth          | 1.00     | -0.16 | 0.23  | -0.35     | -0.02   | -0.16 | -0.02 | -0.03    | -0.04   | -0.02    | -0.06  | -0.06      | -0.15       | -0.12       | -0.13       | 0.12         |          |        | -0.01    | -0.01         | 0.06     | -0.06      | 0.01     | -0.03  | 0.02           |
|---------------------|----------|-------|-------|-----------|---------|-------|-------|----------|---------|----------|--------|------------|-------------|-------------|-------------|--------------|----------|--------|----------|---------------|----------|------------|----------|--------|----------------|
| Income              | -0.16    | 1.00  | -0.43 | 0.02      | -0.00   | 0.58  |       | 0.58     |         |          |        | -0.08      | 0.39        | 0.59        | 0.53        | -0.55        |          |        | 0.28     | 0.09          | -0.02    | 0.18       |          | -0.03  | 0.13           |
| Kidhome             | 0.23     | -0.43 | 1.00  | -0.04     | 0.01    | -0.50 | -0.37 | -0.44    | -0.39   | -0.37    | -0.35  | 0.22       | -0.36       | -0.50       | -0.50       | 0.45         |          |        | -0.17    | -0.08         | 0.01     | -0.16      | -0.21    | 0.04   | -0.08          |
| Teenhome            | -0.35    | 0.02  | -0.04 | 1.00      | 0.02    | 0.00  | -0.18 | -0.26    | -0.20   | -0.16    | -0.02  |            | 0.16        | -0.11       | 0.05        | 0.13         |          |        | -0.14    | -0.02         | -0.04    | 0.04       | -0.19    | 0.00   | -0.15          |
| Recency             | -0.02    | -0.00 | 0.01  | 0.02      | 1.00    | 0.02  | -0.00 | 0.02     | 0.00    | 0.02     | 0.02   | -0.00      | -0.01       | 0.03        | 0.00        | -0.02        |          |        | -0.02    | -0.00         | -0.03    | 0.02       | 0.00     | 0.01   | -0.20          |
| MntCoke             | -0.16    | 0.58  | -0.50 | 0.00      | 0.02    | 1.00  |       | 0.56     |         |          |        | 0.01       | 0.54        | 0.64        | 0.64        | -0.32        |          |        | 0.35     | 0.21          | 0.06     |            |          | -0.04  | 0.25           |
| MntFruits           | -0.02    | 0.43  | -0.37 | -0.18     | -0.00   | 0.39  | 1.00  | 0.54     |         |          |        | -0.13      | 0.30        |             |             | -0.42        |          |        | 0.19     | -0.01         | 0.01     | 0.01       | 0.22     | -0.01  | 0.13           |
| MntMeatProducts     | -0.03    | 0.58  | -0.44 | -0.26     | 0.02    | 0.56  | 0.54  | 1.00     |         |          |        | -0.12      |             |             |             | -0.54        |          |        | 0.31     | 0.04          | 0.02     | 0.10       |          | -0.02  | 0.24           |
| MntFishProducts     | -0.04    | 0.44  | -0.39 | -0.20     | 0.00    | 0.40  |       | 0.57     | 1.00    |          |        | -0.14      |             |             |             | -0.45        |          |        | 0.26     | 0.00          | 0.00     | 0.02       | 0.20     | -0.02  | 0.11           |
| MntSweetProducts    | -0.02    |       | -0.37 | -0.16     | 0.02    |       |       |          | 0.58    | 1.00     |        | -0.12      |             |             |             | -0.42        |          |        | 0.24     | 0.01          | 0.00     | 0.03       | 0.26     | -0.02  | 0.12           |
| MntGoldProds        | -0.06    | 0.33  | -0.35 | -0.02     | 0.02    |       |       |          |         | 0.37     | 1.00   | 0.05       |             |             |             | -0.25        |          |        | 0.17     | 0.05          | 0.12     | 0.02       | 0.18     | -0.03  | 0.14           |
| NumDealsPurchases   | -0.06    | -0.08 | 0.22  | 0.39      | -0.00   | 0.01  | -0.13 | -0.12    | -0.14   | -0.12    | 0.05   | 1.00       | 0.23        | -0.01       | 0.07        | 0.35         |          |        | -0.12    | -0.04         | -0.02    | 0.02       | -0.18    | 0.00   | 0.00           |
| NumWebPurchases     | -0.15    | 0.39  | -0.36 | 0.16      | -0.01   | 0.54  | 0.30  | 0.29     | 0.29    | 0.35     | 0.42   | 0.23       | 1.00        | 0.38        | 0.50        | -0.06        |          |        | 0.16     | 0.03          | 0.04     | 0.16       | 0.14     | -0.02  | 0.15           |
| NumCatalogPurchases | -0.12    | 0.59  | -0.50 | -0.11     | 0.03    | 0.64  |       | 0.72     |         |          |        | -0.01      | 0.38        | 1.00        |             | -0.52        |          |        | 0.31     | 0.10          | 0.10     | 0.14       |          | -0.02  | 0.22           |
| NumStorePurchases   | -0.13    | 0.53  | -0.50 | 0.05      | 0.00    | 0.64  |       | 0.48     |         |          |        | 0.07       |             | 0.52        | 1.00        | -0.43        |          |        | 0.18     | 0.09          | -0.07    | 0.18       | 0.21     | -0.02  | 0.04           |
| NumWebVisitsMonth   | 0.12     | -0.55 | 0.45  | 0.13      | -0.02   | -0.32 | -0.42 | -0.54    | -0.45   | -0.42    | -0.25  | 0.35       | -0.06       | -0.52       | -0.43       | 1.00         |          |        | -0.19    | -0.01         | 0.06     | -0.03      | -0.28    | 0.02   | -0.00          |
| Z_CostContact       |          |       |       |           |         |       |       |          |         |          |        |            |             |             |             |              | ·        |        |          | $\overline{}$ |          |            |          |        | $\blacksquare$ |
| Z_Revenue           |          |       |       |           |         |       |       |          |         |          |        |            |             |             |             |              |          |        |          |               |          |            |          |        |                |
| AcceptedCmp1        | -0.01    | 0.28  | -0.17 | -0.14     | -0.02   | 0.35  | 0.19  | 0.31     | 0.26    | 0.24     | 0.17   | -0.12      | 0.16        | 0.31        | 0.18        | -0.19        |          |        | 1.00     | 0.18          | 0.09     | 0.25       | 0.40     | -0.03  | 0.29           |
| AcceptedCmp2        | -0.01    | 0.09  | -0.08 | -0.02     | -0.00   | 0.21  | -0.01 | 0.04     | 0.00    | 0.01     | 0.05   | -0.04      | 0.03        | 0.10        | 0.09        | -0.01        |          |        | 0.18     | 1.00          | 0.07     |            | 0.22     | -0.01  | 0.17           |
| AcceptedCmp3        | 0.06     | -0.02 | 0.01  | -0.04     | -0.03   | 0.06  | 0.01  | 0.02     | 0.00    | 0.00     | 0.12   | -0.02      | 0.04        | 0.10        | -0.07       | 0.06         |          |        | 0.09     | 0.07          | 1.00     | -0.08      | 0.08     | 0.01   | 0.25           |
| AcceptedCmp4        | -0.06    | 0.18  | -0.16 | 0.04      | 0.02    | 0.37  | 0.01  | 0.10     | 0.02    | 0.03     | 0.02   | 0.02       | 0.16        | 0.14        | 0.18        | -0.03        |          |        | 0.25     |               | -0.08    | 1.00       | 0.31     | -0.03  | 0.18           |
| AcceptedCmp5        | 0.01     |       | -0.21 | -0.19     | 0.00    | 0.47  | 0.22  | 0.37     | 0.20    | 0.26     | 0.18   | -0.18      | 0.14        |             | 0.21        | -0.28        |          |        | 0.40     | 0.22          | 0.08     | 0.31       | 1.00     | -0.01  |                |
| Complain            | -0.03    | -0.03 | 0.04  | 0.00      | 0.01    | -0.04 | -0.01 | -0.02    | -0.02   | -0.02    | -0.03  | 0.00       | -0.02       | -0.02       | -0.02       | 0.02         |          |        | -0.03    | -0.01         | 0.01     | -0.03      | -0.01    | 1.00   | -0.00          |
| Response            | 0.02     | 0.13  | -0.08 | -0.15     | -0.20   | 0.25  | 0.13  | 0.24     | 0.11    | 0.12     | 0.14   | 0.00       | 0.15        | 0.22        | 0.04        | -0.00        |          |        | 0.29     | 0.17          | 0.25     | 0.18       | 0.33     | -0.00  | 1.00           |
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|                     | æ        | -     | 25    | <u>,æ</u> | æ       | #     | Æ     | Mitheath | Writish | MrSweeth | MrtGal | umbeaishin | NumilletPun | mCatalogPun | NumStorePun | um/NetV/Sits | Z CostiC | Z Rev  | Accepter | Accepter      | Accepter | Accepter   | Accepter | Com    | 39             |







# what's going on?

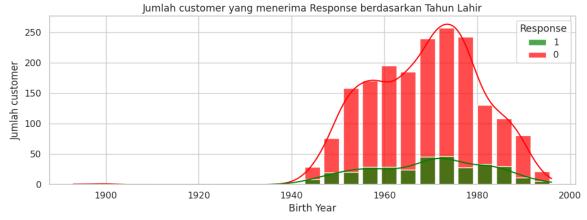
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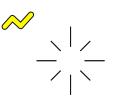
Out of a total of more than 2000 customers, it is unfortunate that the marketing team's offer campaign has only a few respondents.

So the data analytics team is tasked with predicting customer shopping habits to increase sales, and working with the marketing team to provide attractive offers to customers.

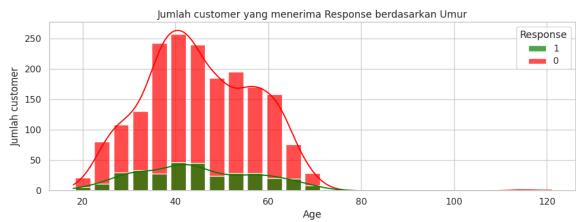








# **1975 & 40**



that's the number that responded here

## Birth Year / Age vs Response



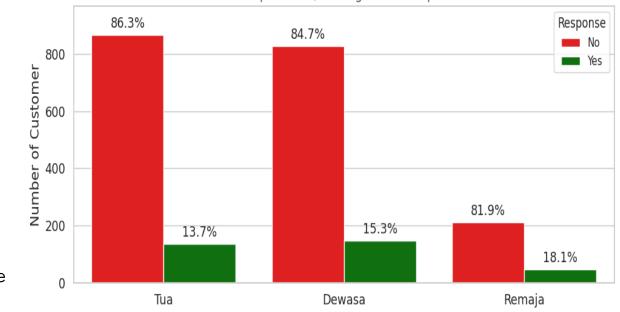
| Tua    | No  | 867 | 1005 | 86.269 |
|--------|-----|-----|------|--------|
| Tua    | Yes | 138 | 1005 | 13.731 |
| Dewasa | No  | 827 | 976  | 84.734 |
| Dewasa | Yes | 149 | 976  | 15.266 |
| Remaja | No  | 212 | 259  | 81.853 |
| Remaja | Yes | 47  | 259  | 18.147 |

for the percentage of how many customers respond the most is in the 'Remaja' data but the actual data is in the 'Dewasa' data even though the percentage is below the 'Remaja' data but the actual number is like this:

- 'Tua' = 13.7% = 138 customers
- 'Dewasa' = 15.3% = 149 customers
- 'Remaja' = 18.1% = 47 customers

#### Comparison of Response Users in Age Group

The older a person is, the higher the response value

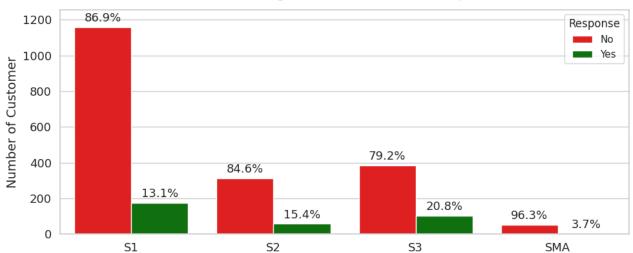


### Age Group vs Response



#### **Comparison of Response Users in Education**

S1 has the Highest Number Customer Response



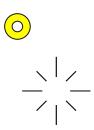


It can be seen that the average customer has an 'S1' education, but for the percentage of customers who respond, there are customers with a 'S3' education, which is 20.8%, but the actual data is like this:

- -SMA = 3.7% = 2 customers
- S1 = 13.0% = 174 customers
- S2 = 15.4% = 57 customers
- -S3 = 20.8% = 101 customers

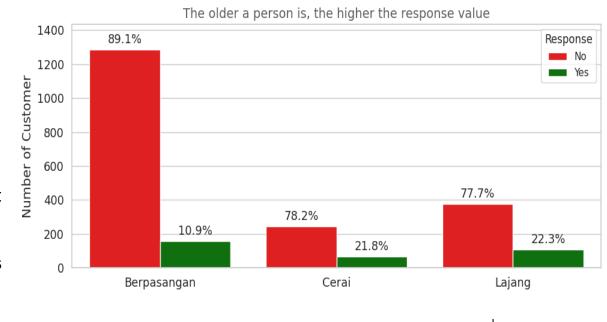


#### **Comparison of Response Users in Marital Status**



customers with the status 'single', which has the highest percentage of 22.3%, but the actual data is like this:

- Lajang = 22,3% = 108 customers
- Berpasangan = 10,9% = 158 customers
- Cerai = 21,8% = 68 customers

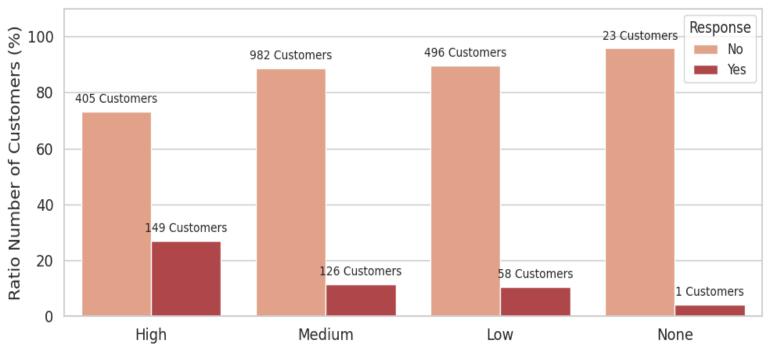


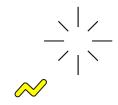
### Marital Status vs Response



#### Comparison of Response Users in Income Segmentation

Higher the income, more likely to give response for campaign

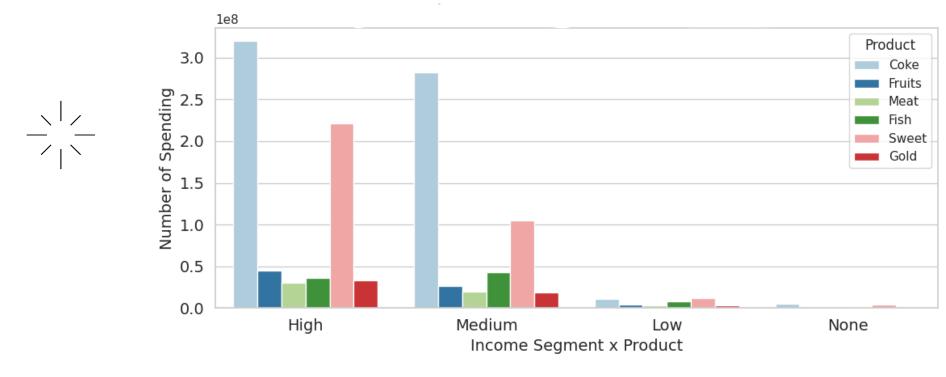




## Income Segment vs Response



#### **Comparison of Income Segment in Product**

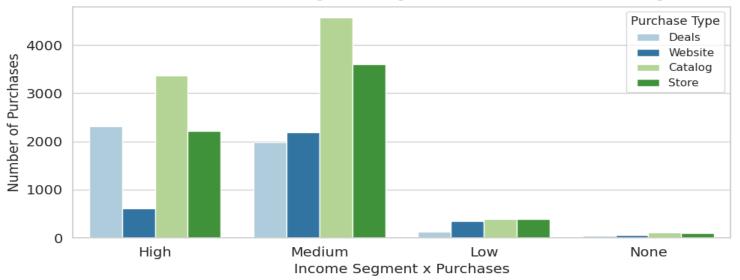


for products that are often purchased there are 2 products are coke and sweet products

### Income Segment vs Product

#### Comparison of Income Segment in Purchase Type

Customers who have in High on average use Purchases Discount and Catalog

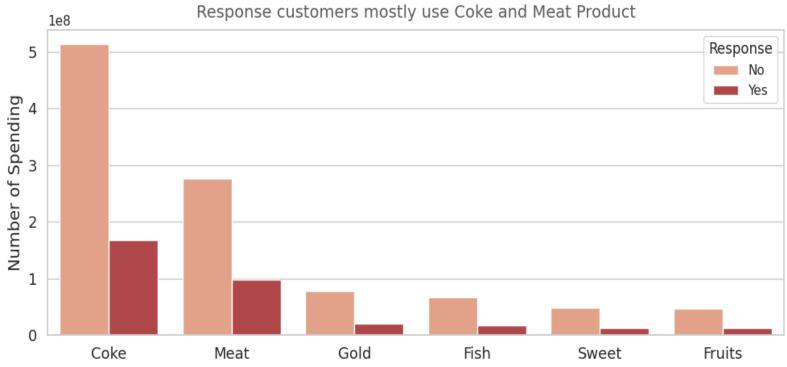




#### Income Segment vs Purchase Type

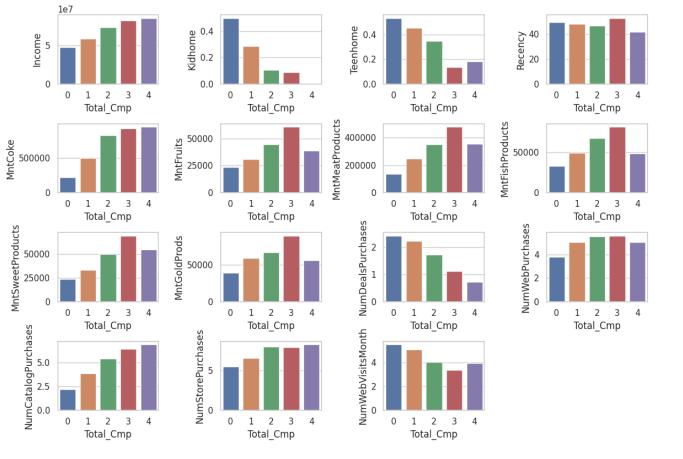


#### Comparison of Response Users in Spending Product







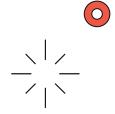




# Conclusions Business Insight 1







The older the customer, the greater the need, it has been proven that most customers who make transactions are adults and old.

Therefore, I would recommend making the store more comfortable so that customers who are a little older can feel comfortable while shopping.



## Conclusions

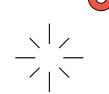
## **Business Insight 2**











Since the most purchased products are Coke and Sweet products, we will offer these 2 products to customers who are Remaja and Dewasa with discounts such as buy 2 get 1 free.



# Conclusions Business Insight 3









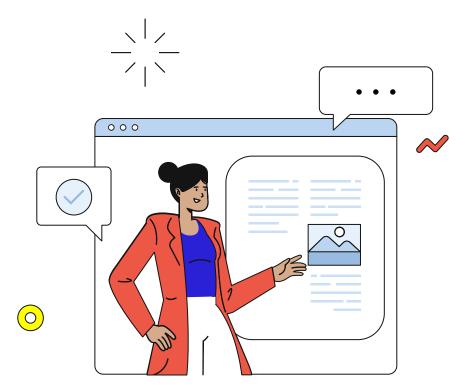


The customers who shop at the store are mostly middle-class customers, as evidenced by the top 3 products that are frequently purchased are coke, meat, and gold.

In order to attract customers' attention and increase sales,

the marketing team will offer attractive discounts, such as a 5% discount on each purchase of meat combined with a purchase of gold, or we can recommend store membership to high-end customers by offering special prices on gold purchases.





# Thanks!

