

## **Appendix**

### **Column key Exhibit 1** (GUZMAN, 2022)

ID: Unique identification code for every customer

Year\_Birth: The Year of a customer's birth

Education: The level of education that a customer completed

Marital\_Status: Status of Marriage

Income: Annual Income

Kidhome: # of children under the age of 13 in Customer's household

Teenhome: # of children between 13-19 in Customer's household

Dt\_Customer: Date of Customer Enrollment

Recency: # of days since last purchase

MntWines: Dollar amount of Wines purchased in last 2 years

MntFruits: Dollar amount of Fruits purchased in last 2 years

MntMeatProducts: Dollar amount of Meat products purchased in the last 2 years

MntFishProducts: Dollar amount of Fish products purchased in the last 2 years

MntSweetProducts: Dollar amount of Sweet products purchased in the last 2 years

MntGoldProds: Dollar amount of Gold products purchased in the last 2 years

NumDealsPurchases: # of purchases made with discount

NumWebPurchases: # of purchases made through the company's website

NumCatalogPurchases: # of purchases made using the catalog

NumStorePurchases: # of purchases made directly in-store

NumWebVisitsMonth: # of visits made through company's website

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

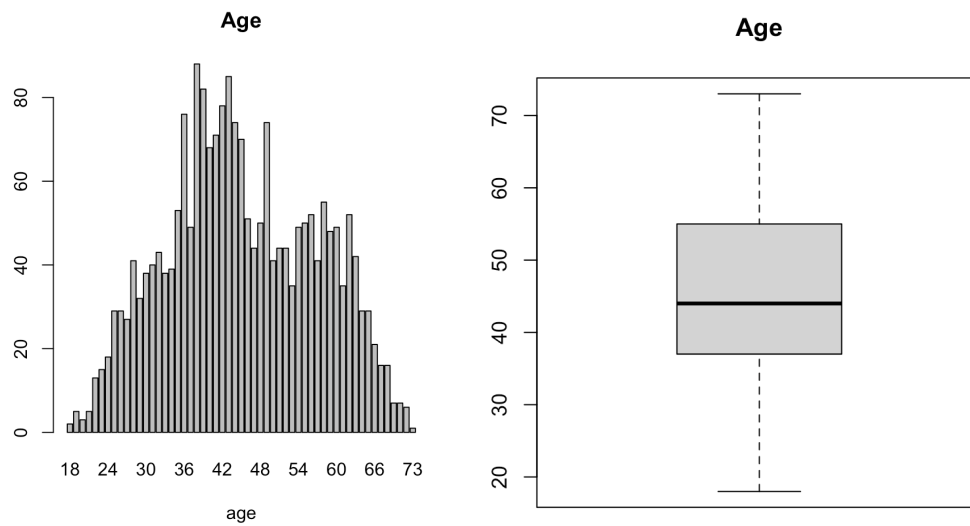
AcceptedCmp5: 1 if customer accepted the offer in the 5th campaign, 0 otherwise

Complain: 1 if customer complained in the last 2 years, 0 otherwise

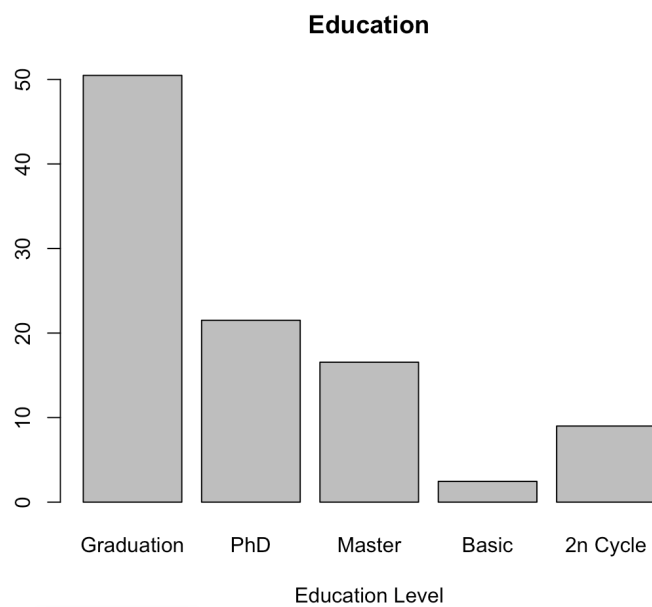
Response: 1 if customer accepted the offer in the last campaign, 0 otherwise

\*Unfortunately there is no available information on variables ZCost and ZRevenue

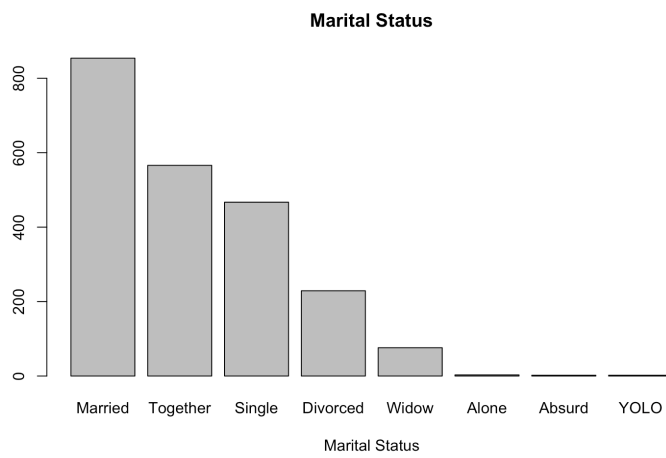
**Exhibit2&3:**



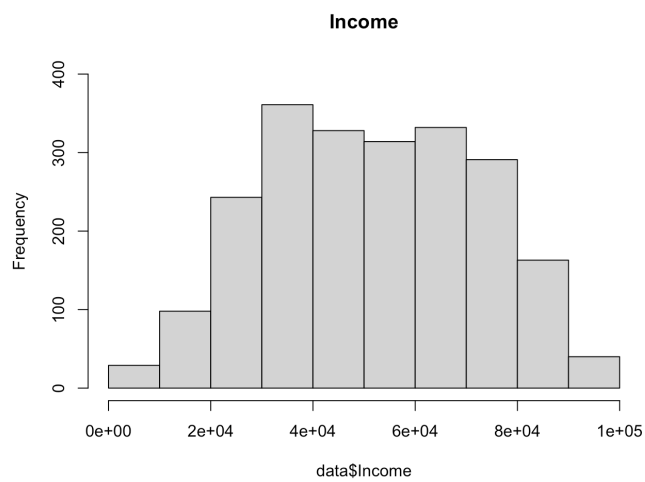
**Exhibit 4:**



**Exhibit 5:**



**Exhibit 6:**



**Exhibit 7:**

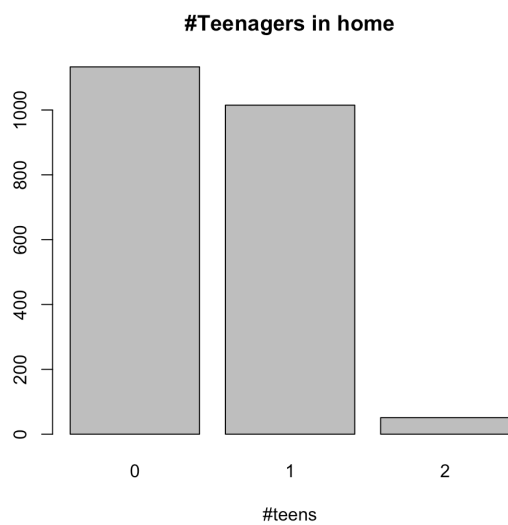


Exhibit 8:

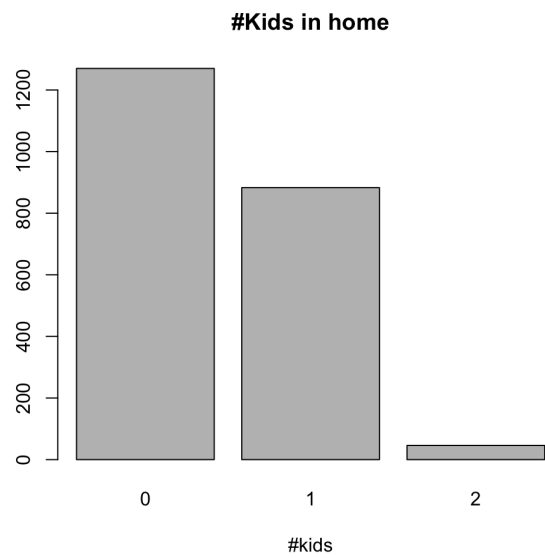
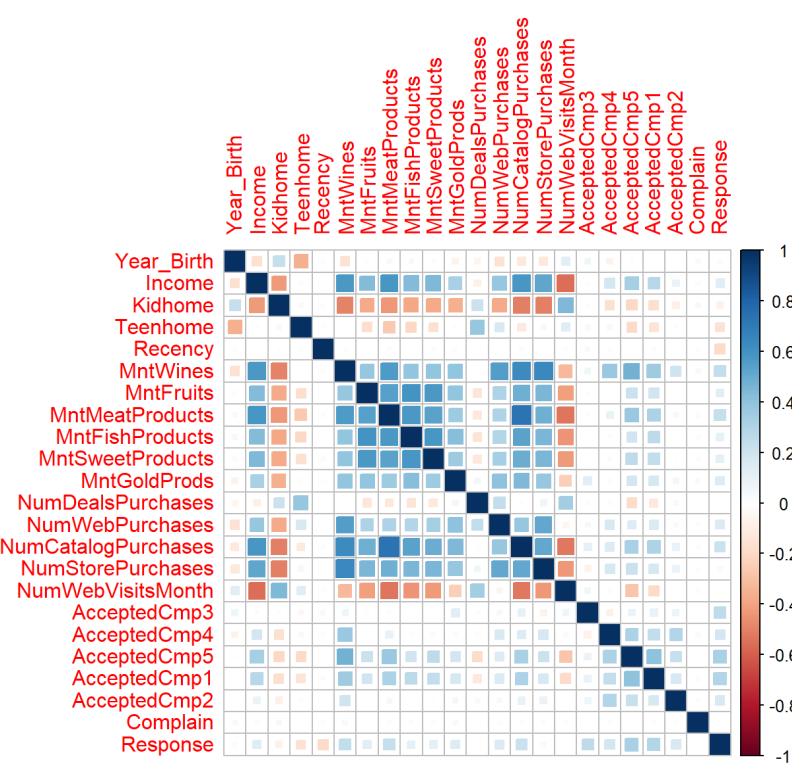
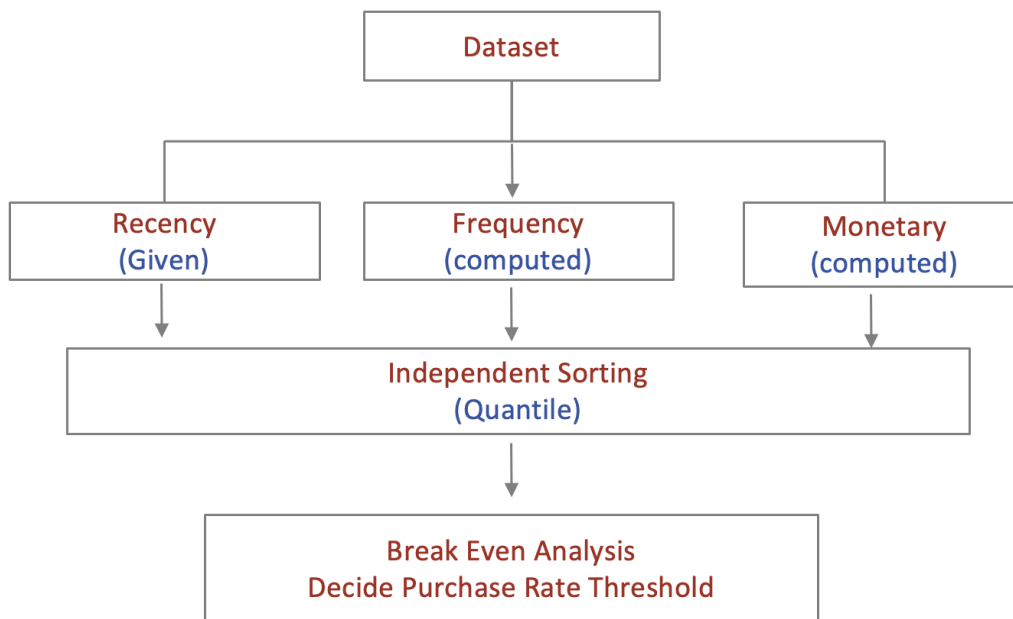


Exhibit 9:



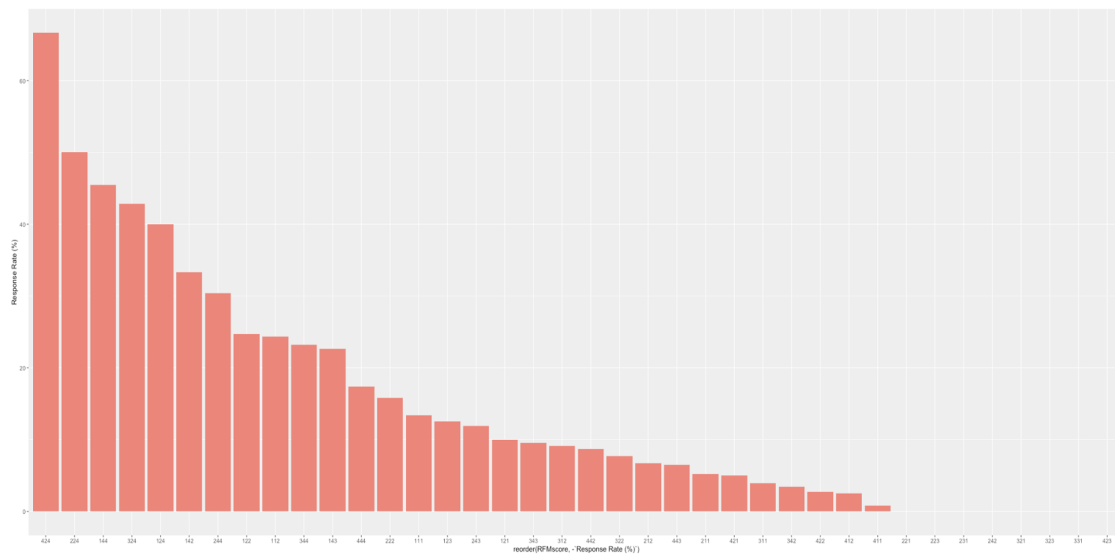
**Exhibit 10**



**Exhibit 11**

Quantiles	Recency	Frequency	Monetary	RFM Score
Min ~ 1 <sup>st</sup> Quantile	0-24	1~8	5~69	1
1 <sup>st</sup> Quantile ~ Median	24~49	8~15	69~296.5	2
Median ~ 3rd Quantile	49~74	15~21	296.5~1048	3
3rd Quantile ~ Max	74~99	21~44	1048~2525	4

## Exhibit 12



## Exhibit 13

**(1) Model\_1: based on customers' demographic data**

log odds(Response) =  $\beta_0 + \beta_1 \text{Year\_Birth} + \beta_2 \text{EducationBasic} + \beta_3 \text{EducationGraduation} + \beta_4 \text{EducationMaster} + \beta_5 \text{EducationPhD} + \beta_6 \text{Marital\_StatusAlone} + \beta_7 \text{Marital\_StatusDivorce} + \beta_8 \text{Marital\_StatusMarried} + \beta_9 \text{Marital\_StatusSingle} + \beta_{10} \text{Marital\_StatusTogether} + \beta_{11} \text{Marital\_StatusWidow} + \beta_{12} \text{Marital\_StatusYOLO} + \beta_{13} \text{Income} + \beta_{14} \text{Kidhome} + \beta_{15} \text{Teenhome} + \beta_{16} \text{Dt\_Customer} + \beta_{17} \text{Recency} + \beta_{18} \text{AcceptedCmp3} + \beta_{19} \text{AcceptedCmp4} + \beta_{20} \text{AcceptedCmp5} + \beta_{21} \text{AcceptedCmp1} + \beta_{22} \text{AcceptedCmp2} + \beta_{23} \text{Complain}$

EducationPhD, Teenhome, Dt\_Customer, Recency, NumStorePurchases, AcceptedCmp3, AcceptedCmp4, AcceptedCmp5. AcceptedCmp1 have the  $\text{Pr} > |t|$  less than 0.05, so they are the significant individual coefficients.

**(3) Model\_3: focus on the variables that have a high correlation coefficient.**

$$\log \text{ odds}(\text{Response}) = \beta_0 + \beta_1 \text{Income} + \beta_2 \text{MntWines} + \beta_3 \text{MntMeatProducts} + \beta_4 \text{MntFishProducts} + \beta_5 \text{NumCatalogPurchases} + \beta_6 \text{AcceptedCmp3} + \beta_7 \text{AcceptedCmp4} + \beta_8 \text{AcceptedCmp5} + \beta_9 \text{AcceptedCmp2} + \beta_{10} \text{AcceptedCmp1}$$

## References

- Abaluck, J., & Adams-Prassl, A. (2021). What do Consumers Consider Before They Choose? Identification from Asymmetric Demand Responses. *The Quarterly Journal Of Economics*, 136(3), 1611-1663. <https://doi.org/10.1093/qje/qjab008>
- About Us: Starbucks Coffee Company. Starbucks.com. (2022). Retrieved 17 October 2022, from <https://www.starbucks.com/about-us/>.
- GUZMAN, J. (2022). *Marketing Analytics, Classification, and EDA*. Kaggle.com. Retrieved 18 October 2022, from <https://www.kaggle.com/code/jalenguzman/marketing-analytics-classification-and-eda>.
- Karaman, B. (2019). *Market Response Models*. Market Response Models. Retrieved 18 October 2022, from <https://towardsdatascience.com/data-driven-growth-with-python-part-2-customer-segmentation-5c019d150444>.
- Reutterer, T., Mild, A., Natter, M., & Taudes, A. (1987). A dynamic segmentation approach for targeting and customizing direct marketing campaigns. *Journal Of Interactive Marketing*, 20(3-4), 43-57. <https://doi.org/10.1002/dir.20066>
- SALDANHA, R. (2020). *Marketing Campaign*. Kaggle.com. Retrieved 18 October 2022, from [https://www.kaggle.com/datasets/rodsaldanha/arketing-campaign?select=marketing\\_campaign.xlsx](https://www.kaggle.com/datasets/rodsaldanha/arketing-campaign?select=marketing_campaign.xlsx).
- Wong, K., Zhou, S., Yang, Q., & Yeung, J. (2005). Mining Customer Value: From Association Rules to Direct Marketing. *Data Mining And Knowledge Discovery*, 11(1), 57-79. <https://doi.org/10.1007/s10618-005-1355-x>