Dataset:

- Marketing Analytics

Data preprocessing and cleaning:

- Drop null values in “Income”
- Remove outliers
- Correcting Columns names
- Category Incomes (Medium)
- Feature Engineering
    - hasChild
    - numOfChild
    - sumOfPurchases
- Mixed ‘Master ‘ and ‘2n Cycle’

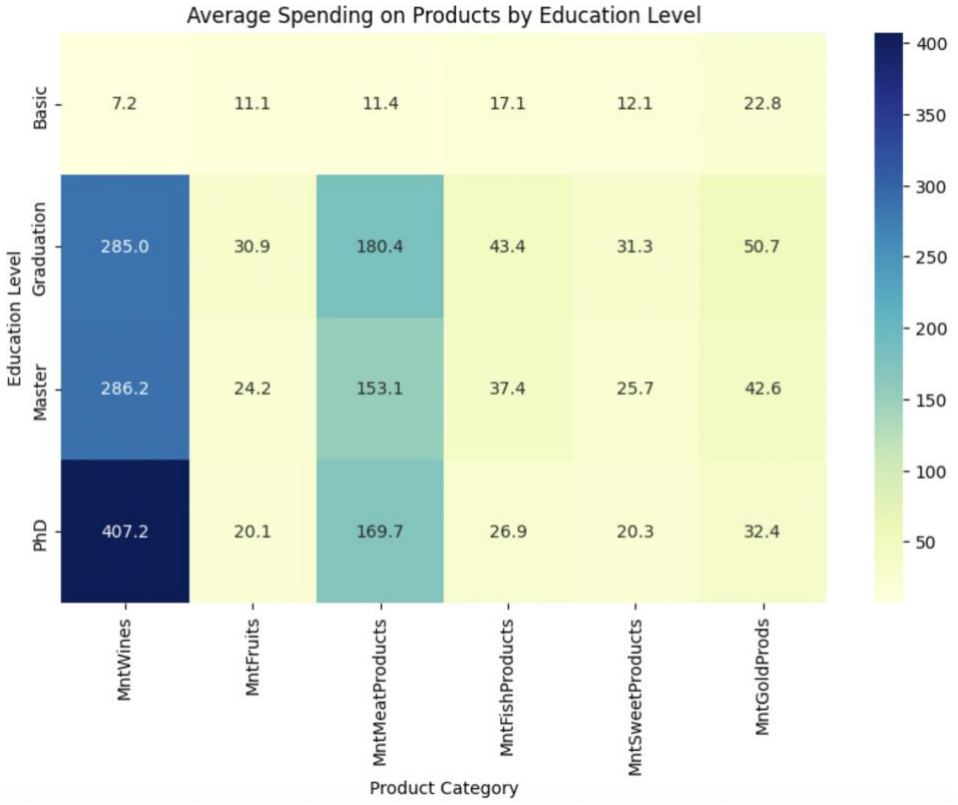
Insights:

- Most of the customers are in their 50es
- Most of the customers are graduation **educated**
- The average of the income of customers is 50,000 unless basic
- Most of them have children
- Sales through store is the more common than other ways of sales
- the basic spends ¼ of their income on gold
- The last campaign is most affective on sales
- The basic is least affected by campaign

Plannings:

- **1st**:
    - Choose the right product to the right person
        - We find that purchases from 1/3 are Store and Web, but store is higher.
        - The people categories on their education.
        - And if children is affecting on what is the most purchases category, there is no affect.
        - “Wines” have the highest amount of purchases with education people except “Basic’ people focus on ‘Gold’

- We found also they took wine always with meat in the heatmap so we assume that always the customer that took wine will always take meat

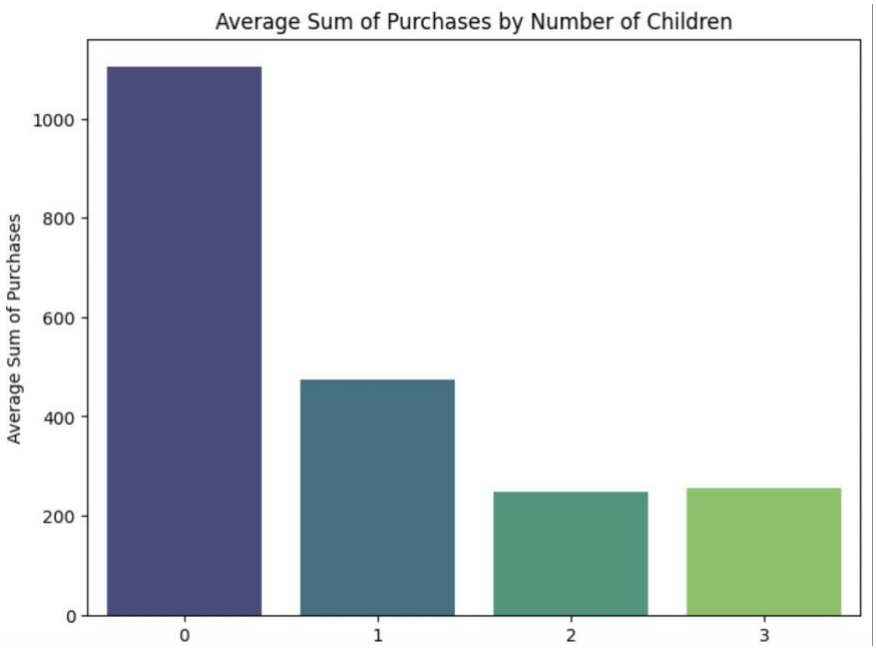


- We make T-Test and we proof that

```
Wine Spending: t=6.635212040788567, p=4.061468765199518e-11
Meat Spending: t=5.191552263735796, p=2.275882368364343e-07
```

- And for basic people who buy gold we find they also there is a moderate relation with fish products
- We look to the campaign, and we found there no relation with any thing

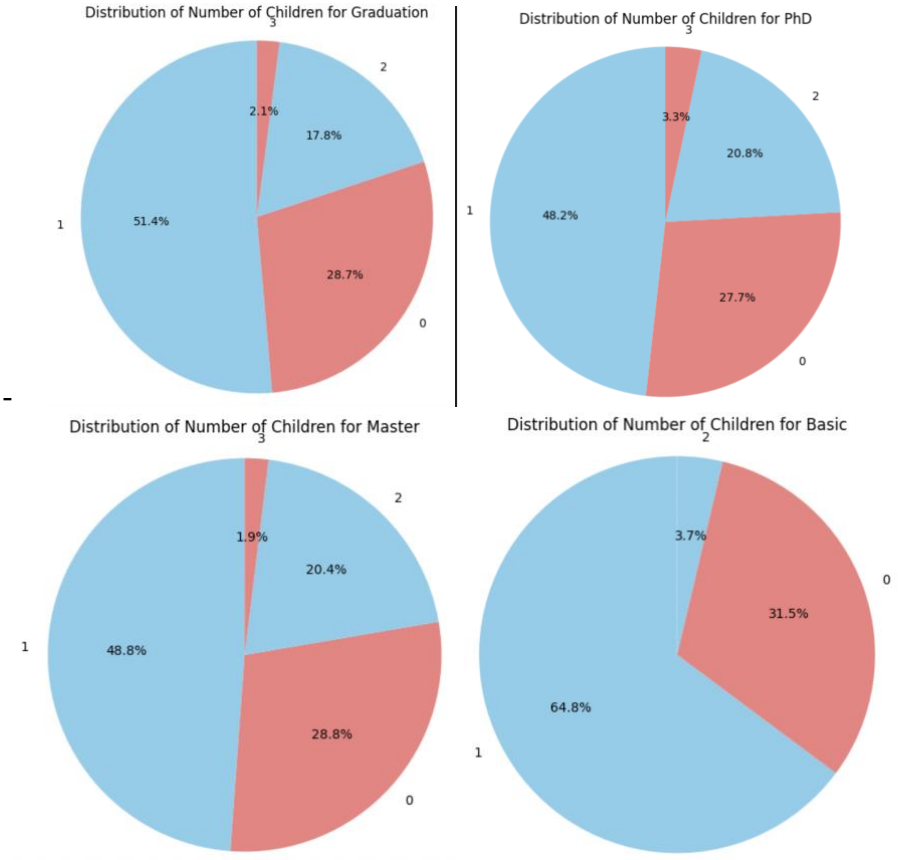
- **2nd: We ask "What is the affect of Number of children and Wine purchases on the customer?"**
    - We look how the effect of purchases based on number of children



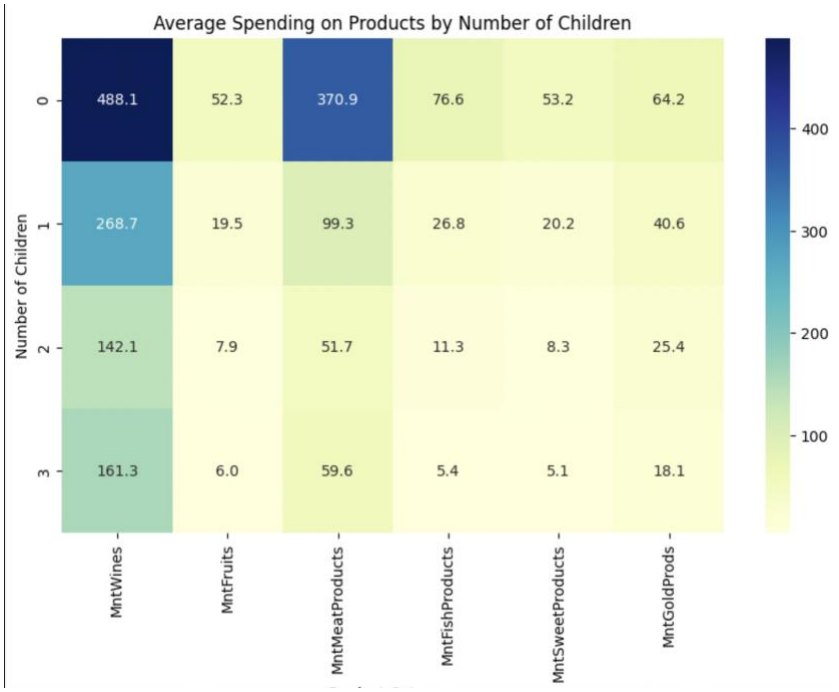
    - We hypothesis that there is negative relationship between number of children and sum of purchases

```
Pearson corr: -0.500308410296423, p-value: 1.2222388669280348e-140
spearman_ corr: -0.4841975464768967, p-value: 1.4527881296179663e-130
```

- We look how much of children based on the education



- We look to the relationship between number of children and purchases of wine



- We hypothesis that there is negative relationship between number of children and wine's purchases
- We proof is using pearson, spearman tests

```
Pearson corr: -0.35378166131234134, p-value: 2.645649163543225e-66
spearman_ corr: -0.336098808889777, p-value: 1.2567744773051027e-59
```