

HW9

William Florez

Describe analytics models and data that could be used to make good recommendations to the retailer. How much shelf space should the company have, to maximize their sales or their profit?

Part I Hypothesis testing

In general, my approach for solution is validate if hypothesizes are true and then use optimization for improve sales. Hypothesizes are tested using A/B methodology.

Type of client labels.

n1: Highly, Medium, Low, Zero

n2: Highly, Medium, Low, Zero

n3: Highly, Medium, Low, Zero

n4: Highly, Medium, Low, Zero

For each combination of n1, n2, n3 and n4.

Type of client i = n1 frequent visitor, n2 frequent buy product X, spend n3 in each visit, n4 frequent buy complementary products.

Ho: More shelf space increase sales?

Given {
 Type of client
 Time series of change in quantity of product X
}

use {Changed detection adjusted with smoothing average for season and trends}

to {Detect if there are increase in quantities sales of product X by type of client}.

Note that this will disaggregates result by type of client, so the total sales is the sum of the result of each type of customer

Ho: More sales increase sales of complementary sales?

Given {
 Type of client
 Time series of change in quantity of complementary products
}

use {Changed detection in products adjusted with smoothing average for season and trends}

to {Detect if there are increase in quantities sales of complementary products by type of client}.

Note that this will disaggregates result by type of client and complementary products, so the total sales is the sum of the result of each type of customer

Ho: Larger effect if complementary products are adjacent?

Given {
 Type of client
 Time series of change in quantity of product X
 Time series of change in quantity of complementary products
}

Changed detection in products adjusted with smoothing average for season and trends
Distance within product X and complementary products
}

use {linear regression for each product-pairs}

to {Detect if distance is an important feature in sales of product-pairs}.

Note that this will disaggregates result by type of client and product-pairs, so the total sales is the sum of the result of each type of customer

Part II: Optimization models to improve location and size

Finally, I take the approach proposal in lectures to find the best combination of size and location to improve total sales

Optimize value of space

Given {
Groups from earlier models,
Effect of shelf space on sales,
Past sales data for product types and product-type pairs,
}

use {Optimization model}

to {Assign amount of shelf space for each product}

Optimize locations in store

Given {
Groups from earlier models,
Store layout,
Customer purchase patterns,
}

use {Optimization model}

to {Locate groups in store for maximum sales benefit}