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BUSINESS CASE 2: MARKET BASKET ANALYSIS

Business Cases with Data Science

Acreditações e Certificações

Instituto Superior de Estatística e Gestão da Informação
Universidade Nova de Lisboa

Summary

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2. Key problems
3. Data
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Business situation

Case 2: Market basket analysis

products or services that go together

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Background

The restaurant business is more competitive now than ever before.

The known slogan about customers, “if I build it, they will come” is no longer valid (1, 2). Especially because, today, many customers do not go to restaurants. They order the food and beverages to wherever they are (home, office, or any other location).

Like in many other industries, in the restaurant industry, competition is ferocious. The continuous opening of new competing restaurants, with new concepts and new type of offerings, puts high pressure on established restaurants to maintain their operation operating at normal levels (3).

Introduction

C, a company created more than two decades ago, owns several restaurants in Cyprus. These restaurants are grouped into different brands according to the restaurant's concept, location, and type of cuisine.

One of the first brands created by C, specializing in Asian food, mainly Chinese food, is struggling to maintain its profit margin and continuous growth due to increasing competition and customers' changes in habits. To try to revert this process, C wants to take advantage of its sales data to understand customers' patterns of consumption and preferences.

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Key problems

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Key problems (1/2)

C has several questions that it hopes to get answers to:

- Are there any differences between dine-inn customers and delivery customers?
- Is the product offering adequate (e.g., do customers make strange combination of products) ?
- Are there any patterns in consumption that may indicate tendencies?

Key problems (2/2)

By answering the previous questions, C expects to get insights that may be useful in terms:

- Creation of set menus
- Introduction of new products
- Understand substitute products
- Recommending/promoting cross-selling
- Customer segmentation
- Other possible results depending on the findings

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Data

Case 2: Market basket analysis

Datasets (1/2)

Only one dataset is provided: **AsianRestaurant_Cyprus_2018.txt**

This dataset comprises data from all sales transactions made in one of the most popular restaurants of the chain in Nicosia, the capital of Cyprus. The dataset includes information about the items, including quantities and prices, as well as some customer details.

Datasets (1/2)

The data for this business case could be enriched with data from other sources that could explain consumption in restaurants, such as:

- **Holidays**: to, for example, identify patterns in festive days. This information is available at https://www.timeanddate.com/holidays/cyprus/2018
- **Weather conditions**: to, for example, identify patterns according to weather conditions. This is information is available at https://www.wunderground.com/history/monthly/cy/τύμβου/LCEN
- Among other possible types of data and sources

ASIANRESTAURANT_CYPRUS_2018.TXT (1/2)

Each row in the dataset represents a document line (invoice line). The dataset is composed of the following columns:

- **DocNumber**: number of the document. The document number repeats in as many rows as the rows in the original document (invoice)
- **ProductDesignation**: product designation
- **ProductFamily**: name of the family of the product. A product can only be member of one only family
- **Qty**: quantity
- **TotalAmount**: sale price of the total quantity
- **InvoiceDateHour**: date and hour when the document was issued

ASIANRESTAURANT_CYPRUS_2018.TXT (2/2)

- **EmployeeID**: ID of the employee who issued the document
- **IsDelivery**: indication if sale was a delivery or a dine-inn (1: delivery, 0: dine-inn)
- **Pax**: number of persons at the table
- **CustomerID**: ID of the customer (if a customer record was assigned to the sale)
- **CustomerCity**: city of the customer (usually only employed in delivery)
- **CustomerSince**: date of creation of the customer

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Assignment

Case 2: Market basket analysis

Assignment

1. Do a thorough data exploratory analysis to try to find interesting patterns
2. Take advantage of data visualization to demonstrate any relevant patterns
3. Do a market basket analysis to try to answer the business questions
4. Based on the patterns and insights obtained, present recommendations aligned with C's objectives

Questions?

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