

## Class 10 (Case Study) Customer Targeting Using Supervised Learning for M&S

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## Section 1

### Business Objective

## Background

Recently, M&S has launched its highly anticipated [Beauty Advent Calendar for 2024](#), a curated selection of beauty and skincare products worth over £300. This limited-edition calendar is available to customers for only **£50**. With the holiday season approaching, M&S wants to maximize the reach and response of its marketing campaign by promoting the advent calendar offer to the right customers.

M&S decides to use a conventional mailing marketing strategy, where customers receive color-printed leaflets via Royal Mail to their doorsteps. Each mail costs **£1.5 to produce** and another **£0.5 to mail** to the customers. If a customer responds to the offer, M&S expects them to spend **£35** on full-price clothing, homeware or beauty, and purchase the advent calendar at **£50**. The COGS for clothing, homeware, and beauty products is **85%**. And the COGS for the advent calendar is **90%**.

## Cost-Benefit Analyses

- **Cost:** Each mail costs **£1.5 to produce** and another **£0.5 to mail** to the customers.
- The cost is the marketing offer we send, `cost_per_offer`

Based on the information provided, calculate the following values:

- 1 `cost_per_offer`: the cost of sending an marketing offer

## Cost-Benefit Analyses

- **Benefit:** If customer responds to the offer, the management expects customers to buy our products and generate profits for M&S.
- The benefit is the profit margin if a customer responds,  
`profit_per_customer`
- ② `profit_per_customer`: the profit from a customer if a customer responds to the marketing offer

## ROI for Blanket Marketing

- **Blanket marketing:** Send marketing offers to all 2000 customers. Compute the ROI for blanket marketing.
- We already know the cost of sending an offer is `cost_per_offer`. We can calculate the total marketing costs by multiplying the cost per offer by the number of customers in the dataset.
- Based on the `Response` variable in the dataset, calculate the total number of customers who responded to the marketing offer. And then calculate the total profit from the marketing campaign.
  - Tip: you can use `data_full$Response` to extract the `Response` variable as a vector in the dataset. Based on this vector, you can calculate the total number of responding customers and the total profit from the marketing campaign.

## Section 2

# Targeting Using Supervised Learning

## Break-Even Analysis: Break-Even Response Rate

- In order to break-even, we can calculate the break-even response rate from customers, which is the **minimum response rate** we need of a customer in order not to lose money from sending the marketing offer<sup>1</sup>
- Only if a customer responds to us with at least the break-even response rate can we recover the costs of making an marketing offer.
- If we send offers to customers whose expected response rate is lower than the break-even response rate, we make a loss by expectation.

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<sup>1</sup>The idea break-even is similar to the break-even quantity we learned in Week 1, the minimum incremental quantity we need to sell in order not to lose any money. □ ▶ ◀ ◻ ▶ ◀ ≡ ▶ ◀ ≡ ▶ ≡



# Workflow using Supervised Learning

- **Data collection and cleaning**

- Send marketing offers to a random sample of customers and collect their responses (done by M&S)
- Split the data into a training set and a test set

- **Data analytics**

- Train predictive models on the training set
- Predict customer response rate on the test set

- **Business recommendations**

- Target customers based on predicted response rate
- Compute and compare ROIs for each targeting method: (1) blanket marketing; (2) decision tree; (3) random forest

**Let's work on the Quarto document together!**

## Section 3

# Improve Marketing Efficiency Using Supervised Learning

# Customer Life Cycle

- Acquisition
  - Use predictive analytics to target responsive customers to reduce marketing costs
- Development
  - Use predictive analytics to recommend products to customers (personalized recommendation system); for each customer, promote the item with the highest purchase probability
- Retention
  - Use predictive analytics to find valuable customers who are likely to churn and conduct targeted churn management