

Task 1

Presentation for clients

Despite the active promotion of omnichannel ways of contacting customers, the "one-on-one" meeting of a client manager (CM) with a customer still remains the most productive way to understand the needs and requests of customers and to provide the best combination of products and services. Recently, the service package provided by one of the Big Banks was significantly updated, and information about them was available to customers on the bank's website. Isabella, the Vice President of Customer Loyalty and Insight, and her team were most actively involved in developing this package, as well as conducting training with CMs on how best to explain these services to customers, and developed a five-minute presentation for a one-on-one meeting with a client. Isabella believed that such a presentation to the customer should significantly affect the future profitability of this client.

Accordingly, an experiment was conducted: CMs offered clients, who were randomly selected, to explain the essence of the new service package in five minutes. Some clients didn't have time, while others agreed to listen to the presentation.

Several months later, Isabella eagerly summarized the results of the experiment. The complete data are provided here (table 1) - [Data for task](#)

The data for the first five clients are shown in the table below, where the client ID (Client ID) and the forecasted annual profit (Profit, in USD) are indicated: on the left for clients who did not listen to the presentation; on the right for clients who listened to the presentation.

No Presentation		Presentation	
Client ID	Profit	Client ID	Profit
137	380.37	43	633.9
1809	333.11	257	406.61
1929	438.91	477	382.2
Average	591.18	Average	562.25

Isabella was disappointed that the average Profit for clients after presentation was lower than average Profit for clients, who didn't listen to the presentation. She started to investigate, what happens and extracted more detailed information about client's age, monthly income and gender. (table 2)

Questions:

1. What is the reason of unexpected drop of average profit among clients with presentation?
2. Does the presentation have influence on profit?

You should provide storyline of your research and proof conclusions with pictures.

Task 2

In October 2023, a bank branch launched a new credit product, during the pilot of which it issued a pool of loans with the following terms:


- Loan amount: 25,000 USD.
- Loan term: 1 month.
- Interest rate: 2%.

In case of a loan default, the recoverable amount is 80% of its initial issuance amount.

If a client takes a loan and does not default, they are more likely to purchase banking products in the future, adding an additional value of 1000 USD.

In other words, if:

- The client does not take a loan, the bank's profit = 0.
- The client takes a loan and repays it, the bank's profit is $25,000 * 2\% + 1000 = 1500$ USD.
- The client takes a loan and defaults, the bank's loss is 5000 USD.

Each incoming client already has a credit history known to the bank. Socio-demographic data, as well as client credit history data, are located here  data for task 2 on the "dev" tab. This also includes data on defaults in the pilot population.

Field description

ID: Sequential client number.

LIMIT_BAL: Loan amount.

SEX: Gender (1=male, 2=female).

EDUCATION: Education (1=master, 2=bachelor, 3=school, 4=other, 5,6=unknown).

MARRIAGE: Marital status (1=married, 2=single, 3=other).

AGE: Age, in years.

PAY_1: Payment status in the previous month – in September (-2=no payment required – zero balance, "payment holidays", etc., -1=fully paid, 0=use of revolving credit (paid more than the minimum payment, but less than the full balance), 1=payment delay for one month, 2=payment delay for two months, ... 8=payment delay for eight months, 9=payment delay for nine months and more).

PAY_2 to PAY_6: Payment status two to six months ago (scale as described above for PAY_1).

BILL_AMT1 to BILL_AMT6: Credit line balance for September to April.

PAY_AMT1 to PAY_AMT6: Payment amount in September to April.

Default_0: Presence of default.

Assignment:

On the "val" sheet, there are clients who are currently coming to the bank for the new product.

Questions:

- Is it possible to make a profit for the bank with these parameters for this product?
- For the client pool on the "val" tab, you need to mark in the "decision" column: 1, if you would issue a loan to the client, and 0, if not.
- What profit (in USD) do you expect to get from the incoming clients?

Also, provide reproducible code that gives decisions for each client from the test pool.