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Building an Optimal Premium Model in an insurance company
Problem description

We are interested in solving a CRM problem for an insurance company. The tasks to be achieved are:

- Finding the ideal target, in this case, people who are more likely to contract the insurance.
- Obtaining the premium we should offer to each client, it means, the optimal price that should be offered to the clients.
- Calculating the difference between offering the premium randomly and optimally using the information obtained in the model.
- Creating a simple visualization tool that helps identifying which variables have a greater impact on contracting the company's insurance. The ideal tool should compare the results of your model to the descriptive analysis.

Phases

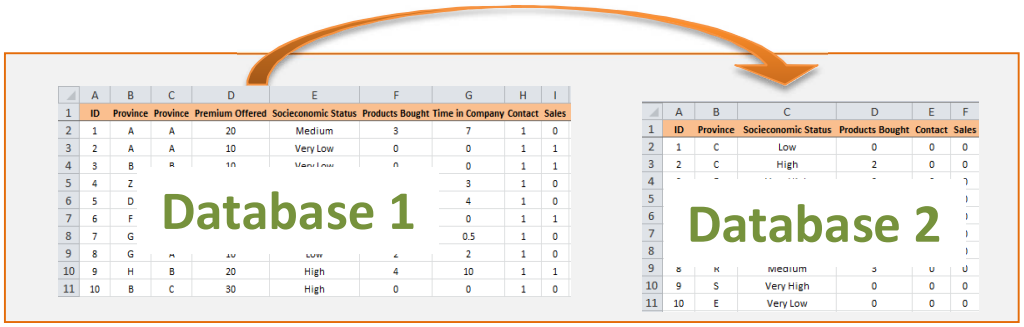
1. **Working with data:**

   Two databases with clients' information are available.

   In the first one we have the information of 20.000 clients which have already been contacted; 9% of them have contracted the product.

   Important data is included such as the premium offered, the number of products that they have already bought, the number of years that they have been clients of the company and the socioeconomic status (an economic and sociological measure combined with the person's work experience and its individual's or family's economic and social position in relation to others, based on income, education, and occupation).

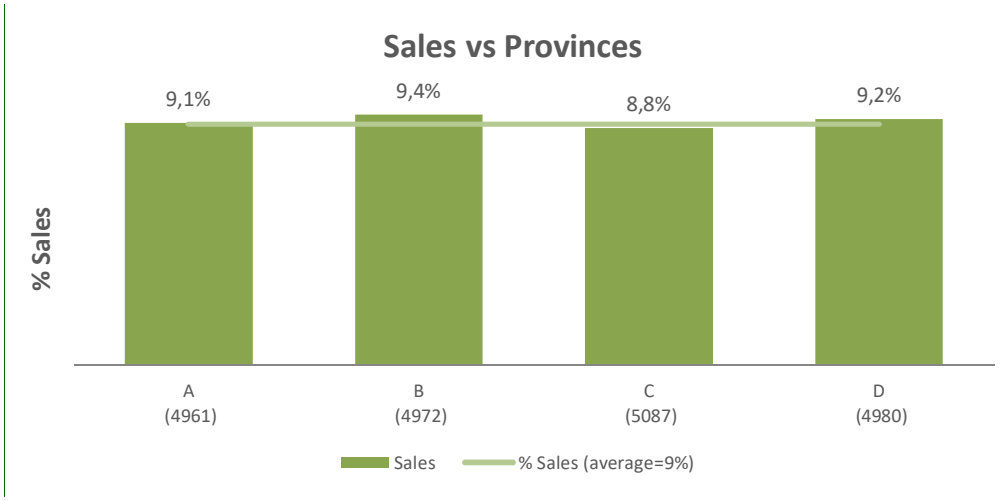
   In the second database of non-previously contacted clients, we have the same information of 10.000 clients but only 5.000 are going to be contacted due to mechanical restrictions.



   Is it worth offering the same premium to all the clients? Is it better to focus on people with some characteristics rather than choosing the clients randomly?

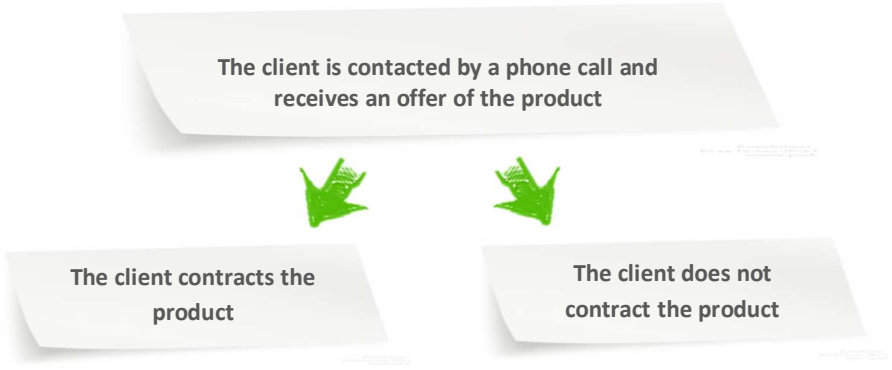
2. Descriptive analysis:

With all the data available in the first database, it is extremely important to make a complete descriptive analysis of the variables to understand the type of information we are dealing with. This can give us an idea of which variables are relevant to solve our problem.



3. Solving the problem:

The objective of this part is, using the first database, finding an optimal strategy to be able to contact those clients who are more likely to contract the product we are offering. This strategy should be applied to the second database to get the ideal target.



The premium is an important variable when deciding whether to contract the insurance or not: an expensive one is going to be rejected more times by the potential clients and a very cheap one is not going to maximise the earnings of the company.

Therefore, once the ideal target is defined, an optimization problem should be formulated to find the optimal premium which maximises the number of contracts, and thus maximises the amount of money that the company is going to earn.

When the optimal premium is calculated, a comparison between the optimal earning and the one that we would get choosing the clients randomly can be calculated to prove the usefulness of the analysis.

4. **Creating a visualization tool:**

   The tool you create should help you visualize and defend the results of your analysis. Any kind of chart can be used, but it is important that the tool helps you compare your results against the descriptive analysis.

   Any technology can be used, although the use of **R Shiny** libraries would be positively valued.