

## EXAM

1. Consider the file **data1.csv**, **an13.csv**, and **in13.csv** containing information on users of a museum card. Each user bought a museum card, which allow her to enter in any museum for free. Look at the file "file description".
2. The card is provided by a "card association". They are willing to take an action to reduce the churn.
3. Not all clients pay the same price. Variable "Prezzo" is the price paid by each consumer to buy.
4. For each visit, the city of Turin pays the "card association" a contribution of 2 Euro.

## DATA PREPARATION

Pay attention. Some variables have multiple Na and outlier which are clearly a mistakes.

## TASK: CHURN and MARKETING CAMPAIGN

1. Create three prediction models to predict the churn. Variable Si2014=0 identifies a churn. Evaluate the three models using the ROC curves and the distribution of prediction probabilities. (30 points)
2. Consider a marketing campaign addressing directly single customers. We know that each contact costs 0.2 euro and each customer can be contacted. When a consumer is contacted she gets as a gift a free museum card for the next year. Let's make some [STRONG] assumptions on the consumer value: we assume that value of consumer is stable over time and it is the price paid plus 10 euro. Of course, for non churners contacted, there is no gain, but only a cost. With this additional information, generate a profit curve of each prediction model. Draw the profit curves of the three models and derive conclusions (70 points).

## OUTPUT

1. VERY short report in which you explain what you have done with no reference to the code, but using the output such as tables and graphs.
2. A commented code (or a notebook)
3. Send everything to [marco.guerzoni@unimib.it](mailto:marco.guerzoni@unimib.it) with "DATAVIZ assignment" as object by the 20<sup>th</sup> of December.

## EVALUATION:

The written assignment is evaluated following the points in brackets for each question. I will take in high consideration attention given to the graphical output.