

# Marketing Analytics Exam – 3rd call

You will have **60 minutes** to answer ten multiple-choice questions and to solve an exercise on Excel composed of 5 tasks. By the end of the exam, you must submit the form by answering the questions, indicating possible assumptions made in the exercise resolution, and uploading the .xlsx file containing all the calculations performed during the test.

In the uploaded Excel file, you need to state and highlight the solutions of the exercise clearly. **If the answers to the exercise are not clearly presented, the exercise will not be considered as valid.**

\* Obbligatoria

\* Questo modulo registrerà il tuo nome, inserire il nome.

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Name \*

2

Surname \*

3

Personal Code \*

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### **Exercise**

Gioconda SPA is a company operating in the service sector. The main business of Gioconda SPA is to provide high-quality beauty and wellness services to its customers. With a team of experienced professionals and a commitment to customer satisfaction, Gioconda SPA offers a wide range of services tailored to meet the diverse needs and preferences of its clients. The company has a customer base of 300.000 clients. On average, it estimates that it loses 1.5% of them monthly. The average price of the service it renders is 60€/month (paid at the beginning of the period), while the variable costs are about 360€/year for each customer.

a) Assess the average customer lifetime of the customer base of Gioconda SPA

**Please report here only the final value expressed in months:**

Il valore deve essere un numero

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b) Disregarding the discount rate, assess the customer lifetime value of Gioconda SPA's customers.

**Please report here only the final value expressed in €:**

Il valore deve essere un numero

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c) Considering  $DR = 1\%$ , assess the customer lifetime value of the 25th percentile of the customers of Gioconda SPA.

**Please report here only the final value expressed in €:**

Il valore deve essere un numero

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d) The company must determine a reasonable budget for a loyalty program able to increase the average lifetime by 3 months. What is the increase in customer equity associated with such an increase?

**Please report here only the final value expressed in €:**

Il valore deve essere un numero

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e) Considering  $RR = 0,975$  and  $DR = 1$ , assess the average CLV.

**Please report here only the final value expressed in €:**

Il valore deve essere un numero

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**Please report here any assumption you relied on for the exercises:**

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**Upload here your solution: \***

 **Carica file**

Limite del numero di file: 1 Limite di dimensioni del file singolo: 100MB Tipi di file consentiti: Word, Excel, PPT, PDF, Immagine, Video, Audio

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**Select the wrong option with respect to CLV (Customer Lifetime Value):**

- ☐ It includes Retention Rate and Discount Rate in its formula
- ☒ If the Discount Rate increases, the CLV generally increases as well (keeping all the other variables fixed)
- ☐ If the Discount Rate increases, the CLV generally decreases (keeping all the other variables fixed)
- ☐ It is based on the expected margins generated during an average business relationship with a customer or a set of customers

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**If  $RR(2) = 0.99$  and  $CumulatedRR(3) = 0.97$ , which of the following is true?**

- ☐  $RR(3) = 0.9797$
- ☐  $RR(2) > RR(3)$
- ☐ Churn rate (3) = 2%
- ☒ We cannot conclude anything about  $RR(3)$

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**Given the rule  $A \Rightarrow B$  in the context of Market Basket Analysis, which of the following statements is false?**

- ☐ Lift measures the performance of the association rule at predicting a specific outcome compared with a random choice
- ☐ High confidence item is most likely being bought together with some other items.
- ☐ Support represents the percentage of purchases including the itemset
- ☒ Confidence of the rule can be calculated as  $\text{Support}(A) / \text{Support}(A \& B)$

Imagine having a dataset called "BASKET" in which transactions are described in terms of:

- Type of product purchased (A, B, C, etc.)
- Transaction in which the purchase happened (1, 2, 3, etc.).

What could be the output of the following code on SQL?

```
Select Product, Count(*) as transactions
INTO newtable
From BASKET
Group by Product;
```

- ☒ A table called "newtable" with two columns: one is called "Product" and it contains unique values (alphabetic ones); the other is called "transactions" and it includes a count of the number of transaction in which each product is present
- ☐ A table called "newtable" with two columns: one is called "Product" and it contains a count of the number of product present in each transactions; the other is called "transactions" and it contains unique values (numeric ones)
- ☐ A table called "newtable" with two columns: one is called "Product" and it contains unique values (numeric ones); the other is called "transactions" and it includes a count of the number of transaction in which each product is present
- ☐ A table called "newtable" with two columns: one is called "Product" and it contains a count of the number of product present in each transactions; the other is called "transactions" and it contains unique values (alphabetic ones)

Consider the following data from a market basket analysis.  $\text{Support}(A) = 0.8$ ,  $\text{Support}(B) = 0.6$ . What is the lift (rounded to two decimal places) of the rule  $A \Rightarrow B$ ?

- ☐ 0.50
- ☐ 0.83
- ☒ We cannot conclude anything about lift
- ☐ None of the other options

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**With respect to Market Basket Analysis, select the wrong answer:**

- ☐ Confidence is the proportion of transactions containing the consequent among those that include the antecedent, and therefore expresses the inferential reliability of the rule
- ☐ An itemset is a collection of one or more items purchased by a customer
- ☒ If Lift > 1, the presence of Left Hand Side variables has a negative effect on the Right Hand Side variable
- ☐ Support is the frequency with which an antecedent–consequent pair appears together in the transactions of a dataset

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**Marketing Mix Models:**

- ☐ Allow understanding how much each marketing input has contributed to sales but cannot be used to make forecasts and scenario simulations
- ☒ Incorporate external factors that may influence KPIs, such as economic conditions, weather conditions and competitor activity
- ☐ Are bottom-up approaches to measure marketing effectiveness
- ☐ Analyze how much credit each touchpoint should receive for a given conversion

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**What is the objective of the following piece of code in R?**

```
churn = na.omit (churn)  
attr(churn , "na.action") <- NULL
```

- ☒ It removes all incomplete cases of a data frame called "churn"
- ☐ It fills all incomplete cases of a data frame called "churn" using a weighted average
- ☐ It fills all incomplete cases of a data frame called "churn" using the median values
- ☐ None of the other options are correct

**Please, select the false option:**

- ☐ In a binomial logistic regression, we have one dependent variable that is dichotomous, and one or more independent variables that are measured on either a continuous or nominal scale.
- ☐ Before doing a Principal Component Analysis (PCA), we should check for outliers.
- ☐ In the context of Random Forest modeling, the out-of-bag (OOB) error rate is computed as an aggregate error from all trees.
- ☒ Principal Component Analysis (PCA) allows summarizing the information in the original variables in a lower number of factors without any loss of information.

**In Attribution Modelling:**

- ☐ The weights in attributing credit decrease as we get closer to the customer if we use a time decay model
- ☐ It is possible to identify the "base" marketing performance and the "incremental" ones
- ☐ 30% of the credit is attributed to the first touch, the lead conversion and the opportunity creation and the rest is split evenly among all the other touchpoints if we use a U-Shaped model
- ☒ It is more difficult to incorporate the effects of the offline media compared to those of digital channels