CASE STUDY – Data Analyst – Marketplace

Welcome to the challenge! We are a cross-functional team of data analysts, data scientists, data engineers and software developers from multiple nationalities and with diverse backgrounds. Our mission is to support data-driven decision making in trivago's marketplace by providing end-to-end analytic tools, metrics & analyses.

A day in this job is dynamic, challenging, and never the same. Our Marketplace is in constant flux and we are looking for someone that can derive understanding of the market dynamics from thorough data analysis.

This assignment is designed to give you a glimpse of some of the challenges you will be facing in this role. Please be aware there are no perfect solutions - for us, it is more important to see how you find solutions, process your ideas and structure your thoughts.

Be creative but realistic about what is possible. We are thrilled to get to know you a bit more through the way you solve the tasks.

SUBMISSION DEADLINE: 7 days from receipt

HOW TO SUBMIT: Please submit your document via the link sent by your recruiter in the email. The format is your choice!

Dataset:

- You are given trivago daily performance data for a certain country for the entire year of 2019.

- Advertisers can control their bids differently for 3 market segments defined by the time-to-travel (TTT), i.e. the number of days between the date a reservation is made and the corresponding check-in date. The 3 (TTT) segments are:
    o short: 0 to 14 days
    o medium: 15 to 60 days
    o long: more than 60 days

- You are given the data for 3 of the main advertisers in this market, identified only as advertisers "A", "B" and "C".

- For each of the 3 advertisers you are provided with the following metrics:
    o clicks: number of clicks made by trivago users
    o cost: amount of money payed by advertisers to trivago (under a cost-per-click model)
    o bookings: number of hotel reservations made by trivago users
    o booking_rev: amount spent by users on hotel reservations (gross revenue for advertisers)

Task 1: Market trends

One of the metrics that we are interested is the conversion rate of our users. In other words: what proportion of our users are able to find their ideal accommodation in trivago. A proxy for this quantity is booking conversion, defined as the ratio between bookings and clickouts.

a. Plot the aggregated (i.e. without any breakout) daily booking conversion for the entire year.
b. Based on the data that you have available, what is the main driver for the trends that you observed on the chart from the previous question?
c. Given the values and patterns in the data can you guess which country this is? How do you inform your guess?

Task 2: Advertiser performance

One of your main tasks as a Marketplace Data Analyst is to understand advertiser performance in Marketplace using the kind of dataset that was provided to you in this case study. Let's now look at it from the advertiser perspective.

a. Assuming a constant margin of 15% (across advertisers and market segments) over the booking revenue, calculate the total profit of each advertiser for the entire period.
b. Based on the trends you observe in the data what recommendations would you give each of the 3 advertisers to improve their campaign in 2020?

Submission Instructions

Please submit your answers in the format that you judge most adequate, as long as source code for the analysis is included.

We will evaluate your submission based on the following criteria:

- Correctness of the solutions
- Quality of the source code
- Reproducibility of the source code
- Quality of the result presentation

Do not share the cases study and/or the results with third parties.
Do not upload the case study and/or results to social platforms or other public spaces.

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