CASE

INTRODUCTION

You are a data engineer / data scientist for one of Denmark's leading agencies within digital marketing and data-driven strategy. You must therefore help Danish e-commerce businesses to measure the effectiveness of their digital campaigns.

As a rule, these companies use the reporting interface in Google Analytics (GA) to see the number of transactions and revenue broken down by individual campaigns. But for some companies, this is not enough. The website may be tracked in such a way that data is not displayed optimally, or the company may have a desire to integrate data from GA with other sources, e.g., a CRM or ERP system. To help them, you therefore need to extract data via GA's API and transform them in different ways. For this you use R (or Python).

In the present case, a relatively simple data transformation is needed. The customer has tracked online purchases in local currency, but now wants to convert these to Danish kroner (DKK). Subsequently, the customer wants to see the result in a Power BI dashboard.

TASKS

1. EXTRACT HISTORICAL EXCHANGE RATES

Historical daily exchange rates can be downloaded for free from quantmod.com via an API that can be accessed via R or Python. R offers a library, quantmod, that makes it easy to use the API. Use this library (or an equivalent in Python) to download daily rates that convert the currencies to DKK from 1/9 2021 to 30/9 2021. These rates should be used in the next assignment.

2. CONVERT USD TO DKK

GA offers an API that requires authentication. To avoid authentication, you will in this case use a (very small) dummy dataset in csv format that could have been extracted from the GA API. The dataset shows the number of orders and revenue for each campaign during September 2021.

The attached dataset consists of the following columns: **date**, **source_medium**, **campaign**, **currency**, **transactions**,and **transaction_revenue**. The latter two show the number of orders and revenue in local currencies. The columns **source_medium** and **campaign** in combination make up unique campaigns, while **currency** is the local currency code needed for matching with the relevant exchange rates.

Your task is now to load the csv file into R (or Python), add a column with the exchange rate per day, which you extracted in task 1. Then, in another new column, you convert the revenue in local currency to DKK.

The resulting table is used in the next task.

3. CATEGORIZATION OF CAMPAIGNS

The customer wants to see the number of orders and revenue for certain types of campaigns. You are therefore told to group campaigns based on their campaign name (the **campaign** column).

In the table from task 2, you add a column that divides campaigns into two groups: those starting with "00: brand" and all others. The first group gets the value "Brand" and the second "Others".

Finally, the table is saved in a csv file, which will be used in the next and last task.

4. SIMPLE DATA VISUALIZATION IN POWER BI

The last step is to load the csv file from task 3 into Power BI Desktop. The task is to construct a single tab with a single table and a date filter. The table should show "Brand" and "Others" as rows and two metrics as columns: Number of orders and revenue in DKK. These two metrics should be defined using DAX. It must be possible to select a period via the date column.