

## Intro

Imagine you've joined a simpler version of TransferWise in the to-India team. Your team is focussed on the EUR to INR route where customers can transfer money on that route to either themselves or others. Because of local regulations the team hasn't implemented any of the other products (e.g the Borderless account) of TransferWise nor is it supporting any other routes to INR.

The team has never had an analyst before and asked you to do the following tasks with the following datasets (*see glossary below for description of tables*).

## Task I

To see how the team is progressing, they look at their KPIs which are the amount of new users, the number of transfers, the volume of transfers (*i.e. the amount of money sent*) and revenue from transfers (*i.e. the fees generated from those transfers*) of transfers that have been successfully transferred. At the moment they don't have all of these numbers in one place and asked you to build a single reporting table with the following requirements:

**Task:** create a reporting table using SQL which allows the team to track their KPIs

1. We need to have the following **measures**:
  1. New users
  2. Users
  3. Transfers
  4. Volume in EUR, GBP and INR
  5. Revenue in EUR, GBP and INR
  6. Active rates of users in relation to the total user base (active users for a period divided by the total number of users at the beginning of the period)
2. With the following **dimensions**:
  1. All measures aggregated to a monthly level
  2. All measures broken down by transfer types

Please show the resulting KPI reporting table as well as the SQL script that creates the table.

## Task II

The team wants to do their planning soon for the next 12 months. However to make this a more effective exercise, they'd like a forecast of **their volume in GBP** on a monthly aggregate level by transfer type. Use the table you've created in the previous task and create a forecast for the next 12 months.

Suggestions:

- Set up the forecast using Python. This is an opportunity to showcase your Python coding skills (no need to make the code more complex than necessary though)
- Start with a brief EDA to identify and characterize the main drivers of volume growth. This part may influence the way you decide to set up your forecast: choice of drivers and approaches
- Apply statistical forecasting technique(s) of your choice - this is an opportunity to illustrate basic statistical modelling/data science skills and reflexes. Please explain your choice of statistical methods, evaluation metrics, parameters (if any) and please show how you evaluated your model(s) - again, no need to make it more complex than necessary, basic statistical methods applied in a clean and efficient way are perfectly fine.

Please show the Python script (or the Jupyter notebook) and the forecast results.

## Task III

Finally, the forecast needs to be shared with your teammates and other teams at TransferWise. Would you be able to wrap the forecast up in a few slides (3-5 max) or in a short explanatory note (1 page max excluding graphs)? Please summarize:

- The results of the EDA - what have you learned about volume growth?
- Short forecast description - what does it show us?
- Methodology - why do you think this works?

## Glossary

The data lives in a SQLite database and should be queryable with most IDEs and/or Jupyter Notebooks. If you have any trouble, let us know. The database has four main tables which are:

1. **transfers** - a history of all transfers created for the users on this route.
2. **transfers\_meta** - some metadata and categorisation on those transfers.
3. **users** - a table of users using the particular route and their first transfer information.
4. **fx\_rates** - a simplified overview for reporting purposes with relevant FX rates to GBP.

Table I: transfers	
transfer_id	The unique identifier of the transfer
user_id	The unique identifier of the user creating the transfer
created_at	The timestamp of the creation of the transfer
completed_at	The timestamp when the transfer was completed
transfer_state	The state of the transfer
source_currency	The source currency of the transfer
target_currency	The target currency of the transfer
flag_not_test	Whether a transfer was made by a test account (e.g. 0) or not (e.g. 1)

transfer_value	The value of the transfer including the fee (also called volume)
fee_value	The fee charged to the customer (also called revenue)

**Table II: transfers\_meta**

transfer_id	The unique identifier of the transfer
transfer_type	Whether the transfer is a business or personal transfer

**Table III: users**

user_id	The unique identifier of the user creating the transfer
first_transfer_id	The corresponding identifier in transfers for the first transfer made
first_transfer_date	The corresponding date in transfers for the first transfer was completed.

**Table IV: fx\_rates**

currency_date	The date of the rate
source_currency	The source currency
target_currency	The target currency
rate	The average rate of that day
inverse_rate	The inverse of the average rate of that day