Case

One of our suppliers asked, how could he drive up his sales. You decided to create a tool that shows, how price decrease by X% will drive supplier sales (both in money and in booking terms) up by Y%.

Data

The best data you can use for this task is reprice logs. Reprice is an algorithm, that follows user click on HotelPage rate. After the click, we send requests to all available suppliers for a specific rate and then choose the one that is the most profitable. The rate with the highest forecasted_profit gets booked.
Each row in the dataset is one rate, that supplier answered with. All rates from one specific reprice process have common reprice_id.
There are two weeks of logs.

Task can be done using Python or SQL

You can download file with data from
https://www.dropbox.com/s/4twan7pj3xdib2t/reprice_data.parquet

Fields description

Order info

- order_id - internal booking ID
- order_date - date of booking creation (in days from 1/1/1970)
- order_status - order status. Values: 'cancelled' - booking has been cancelled by a user prior to arrival, 'noshow' - a guest never arrived to the hotel (that is also a cancellation), 'rejected' - booking has been cancelled by hotel prior to guest arrival, 'completed' - booking has not been cancelled yet. 'Completed' status may change, if guest or hotel cancels the booking.
- cancellation_probability - internally calculated probability of booking being cancelled (turning to 'cancelled', 'noshow' or 'rejected' status)
- booked_supplier - supplier, that was successfully booked after reprice
- booked_supplier_feed - supplier feed, that was successfully booked after reprice. Different suppliers can have feeds with similar names. Full feed name can be obtained by concatenating booked_supplier and booked_supplier_feed fields.
- selling_price - price paid by customer for the booking in mysterious currency (MYS)

Reprice info

- reprice_supplier - supplier, that answered with reprice rate
- reprice_supplier_feed - supplier feed, that answered with reprice rate. Different suppliers can have feeds with similar names. Full feed name can be obtained by concatting booked_supplier and booked_supplier_feed fields.
- source_price - price, that we would pay to supplier, if we were to book this rate. In MYS currency.
- source_commission - commission, that would be paid to us by supplier, if we were to book this rate. In % of source_price.
- forecasted_profit - internally calculated profit of booking reprice rate in comparison to an original rate. In MYS. Let's assume, that only source_price change can directly affect forecasted profit. If source_price is 1 MYS lower, than forecasted profit is 1 MYS higher and vice versa.

Expected result

As a final result, we expect to see an algorithm, that calculates how one supplier source_price decrease will affect # of bookings and selling value of this supplier.
It should include code (in Python or SQL) and any interface (text report, excel-file, presentation or visualisation in any BI tool)

Hint

- Price decrease will affect source price. Change in source price will affect forecasted_profit and therefore, order in which accepted rates would be booked.