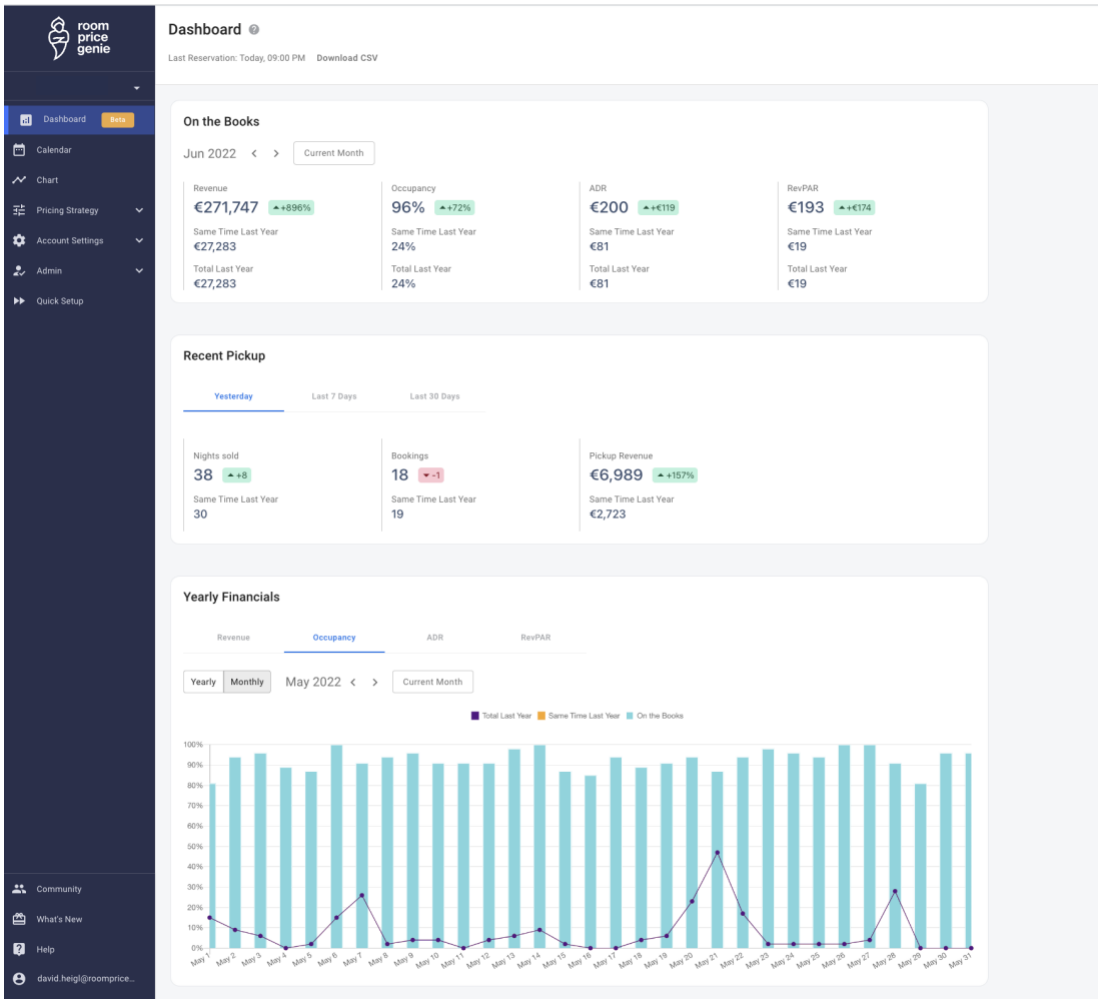
RoomPriceGenie Python Coding Challenge 2022

Problem

Currently, RoomPriceGenie's product team is working on a performance dashboard for every client. The Dashboard shows all relevant KPIs like Revenue, Occupancy, ADR (Average Daily Rate), RevPAR (Revenue Per Available Room) and very basic analysis of the Pickup (showing the booking trend). Note: In the following, we will use the terms booking and reservations synonymously.



Many clients mentioned that they wish to analyse their pickup (when bookings are coming in) in more detail using a booking curve. A booking curve is a chart of reservations on the books for a given day, recorded on a daily basis (see image below). In other words, it is a chart that shows how many reservations the hotel had for a given day (y-axis) up to 100 days before the booking (x-axis).

We decided on the following requirements for the booking curve:

- 100 days back (x-axis)

- Occupancy in percent (y-axis)
- Line 1: Booking curve this year (in the picture below, it is a stacked wave, please only create a single line or wave)
- Line 2: Booking curve same time last year (same time last year -> analyse situation 364 days back)

Hint: The booking curve does not have to rise every day. Cancellation also should be considered.

Goal of this Challenge

- Plot Booking Curve for the day 16.07.2022 -> see requirements above
- Optional Goal: Describe in words, how you would calculate the Booking Curve of Month July 2022

Input

To make the case more realistic & fun, we provide your real (encrypted) client data on one of our customers in Amsterdam. **Hint: Not all columns are needed to solve the challenge.**

- NIGHT_OF_STAY -> row contains information about this night of a certain booking
- ROOM_RESERVATION_ID -> unique identifier of a booking
- RPG_STATUS
    - 1: reservation or update
    - 2: cancellations
- ROOM_ID -> unique id of a room
- DATE_LAST_MODIFIED -> date last modified of the reservation (can be outdated)
- DATE_OF_RESERVATION -> date, the reservation has been booked
- CANCELLATION_DATE -> date, the reservation has been cancelled
- START_DATE_OF_STAY -> date of arrival
- END_DATE_OF_STAY -> date of departure
- DAILY_RATE -> price of booking

Reservations Data Logic – Example of a Cancelled Reservation

In the screenshot below, you can see that the room_reservation_id **ad6fd6c6-42ea-4818-a629-aead0139ce6c** is a reservation of 3 nights (23. – 26.09.2022), was booked on the 2022-06-07 and cancelled on 2022-06-29.

NIGHT_O	ROOM_RESERVATION_ID	RPG_STATUS	ROOM_ID	DATE_LAST_MODIFIE	DATE_OF_RESERVA	CANCELLATION_D	START_DATE_OF_S	END_DATE_OF_S	DAILY_R
2022-09-23	ad6fd6c6-42ea-4818-a629-aead0139ce6c	1	c0c94bb0-6f3e-471f-935a-ab5800c632c7	2022-06-07 00:00:00.000	2022-06-07		2022-09-23	2022-09-26	347.55
2022-09-24	ad6fd6c6-42ea-4818-a629-aead0139ce6c	1	c0c94bb0-6f3e-471f-935a-ab5800c632c7	2022-06-07 00:00:00.000	2022-06-07		2022-09-23	2022-09-26	356.36
2022-09-25	ad6fd6c6-42ea-4818-a629-aead0139ce6c	1	c0c94bb0-6f3e-471f-935a-ab5800c632c7	2022-06-07 00:00:00.000	2022-06-07		2022-09-23	2022-09-26	241.81
2022-09-23	ad6fd6c6-42ea-4818-a629-aead0139ce6c	2		2022-06-29 18:49:10.000	2022-06-07	2022-06-29	2022-09-23	2022-09-26	-347.55
2022-09-24	ad6fd6c6-42ea-4818-a629-aead0139ce6c	2		2022-06-29 18:49:10.000	2022-06-07	2022-06-29	2022-09-23	2022-09-26	-356.36
2022-09-25	ad6fd6c6-42ea-4818-a629-aead0139ce6c	2		2022-06-29 18:49:10.000	2022-06-07	2022-06-29	2022-09-23	2022-09-26	-241.81

Reservations Data Logic - Example of a reservation update

In the screenshot below, you can see that the room_reservation_id **0e52c885-d83f-4345-8d77-aebf01222fb7** is a reservation of one night, which was booked on the 2022-06-25 (1 day before the stay) and updated 4 times. Reasons for updates could be change of price, change of room id, or purchase of extra services). In this case, one update changed the room id, the reason for the other updates is not evident.

NIGHT_O	ROOM_RESERVATION_ID	RPG_STATUS	ROOM_ID	DATE_LAST_MODIFIE	DATE_OF_RESERVA	CANCELLATION_D	START_DATE_OF_S	END_DATE_OF_S	DAILY_R
2022-06-26	0e52c885-d83f-4345-8d77-aebf01222fb7	1	1e56f140-04f9-4420-8116-ab5800c632c7	2022-06-25 00:00:00.000	2022-06-25		2022-06-26	2022-06-27	76.1
2022-06-26	0e52c885-d83f-4345-8d77-aebf01222fb7	1	1e56f140-04f9-4420-8116-ab5800c632c7	2022-06-25 18:31:49.000	2022-06-25		2022-06-26	2022-06-27	0
2022-06-26	0e52c885-d83f-4345-8d77-aebf01222fb7	1	397ada85-6da0-4ec7-9da0-ab5800c632c7	2022-06-26 10:35:34.000	2022-06-25		2022-06-26	2022-06-27	0
2022-06-26	0e52c885-d83f-4345-8d77-aebf01222fb7	1	397ada85-6da0-4ec7-9da0-ab5800c632c7	2022-06-26 12:50:43.000	2022-06-25		2022-06-26	2022-06-27	0
2022-06-26	0e52c885-d83f-4345-8d77-aebf01222fb7	1	397ada85-6da0-4ec7-9da0-ab5800c632c7	2022-06-27 04:43:03.000	2022-06-25		2022-06-26	2022-06-27	0

Hint: Not every record with RPG_STATUS = 1 can be seen as room sold – it could also be an update and have no influence on the hotel's occupancy

Output / Deliverables

- Code in .py (file) or .ipynb (Jupyter notebook) file
- Plot(s), either .png files or in the Jupyter notebook

Limits

- Please code in Python
- We suggest to code in Jupyter Notebook (Anaconda) – not a must though
- We recommend using the Pandas library – not a must though
- Do not share this file or any of the provided data

Evaluation Metrics

- Code readability (comments and variable naming) & code structure (functions would be nice, class not a must)
- Approach (data exploration) and Result (focus on numbers only – not plot design)
- Code Efficiency (least important)

Reward

- EUR 100 Amazon Voucher
- Bonus: Possibility of an employment offer at RoomPriceGenie

Everyone at RoomPriceGenie wishes you: Good Luck!