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## BUSINESS CASE

Benjamín Mancera  
Celia Manzano  
Ema Rosas  
Luis Martinez  
Silvia Alonso

# GIVEN DATA



**bookings.csv**

⋮

- booking\_id
- hotel\_id
- country
- booking\_date
- cancellation\_date
- checkin\_date
- checkout\_date
- status
- source
- agency\_id



**hotel\_bookings.csv**

⋮

- Booking and Arrival Dates
- Lead Time
- Number of Nights
- Number of Adults and Children
- Meal Type
- Country
- Market Segment
- Distribution Channel
- Other Booking Details



**payment\_activation\_rate.csv**

⋮

- month
- payment\_activation\_rate



# Question 1

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Identifying suspicious patterns  
(possible attempts to avoid paying commission fees)

1

A reservation  
**is cancelled**

2

**Shortly after:**  
New manual  
reservation is made

3

**The new manual reservation:**  
same hotel  
same check in





```
WITH cancelaciones AS (  
  SELECT  
    agency_id,hotel_id,checkin_date,booking_date  
  AS fecha_cancelacion  
  FROM bookings  
  WHERE status = 'cancelled'),  
  
  nuevas_reservas AS (  
    SELECT  
      agency_id,hotel_id,checkin_date,booking_date  
    AS fecha_nueva,source  
    FROM bookings  
    WHERE source = 'booking.com' OR source = 'manual')
```



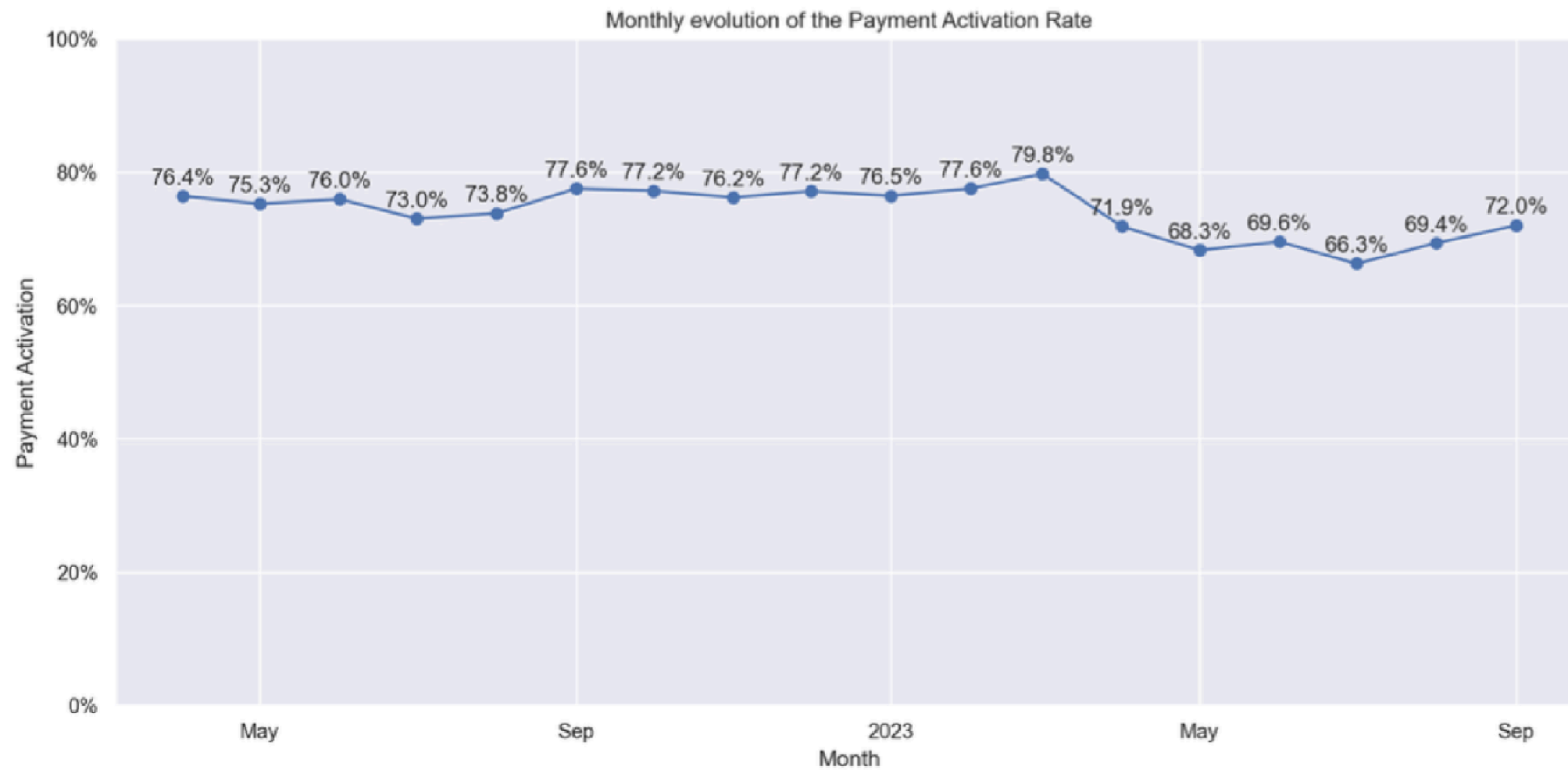
```
SELECT
    c.agency_id,c.hotel_id,c.checkin_date,
    c.fecha_cancelacion,n.fecha_nueva
FROM cancelaciones c
JOIN nuevas_reservas n
    ON c.agency_id = n.agency_id
    AND c.hotel_id = n.hotel_id
    AND c.checkin_date = n.checkin_date
    AND DATEDIFF(n.fecha_nueva, c.fecha_cancelacion)
    BETWEEN 0 AND 1
ORDER BY
    c.agency_id, c.hotel_id,
    c.checkin_date, c.fecha_cancelacion;
```



# Question 2

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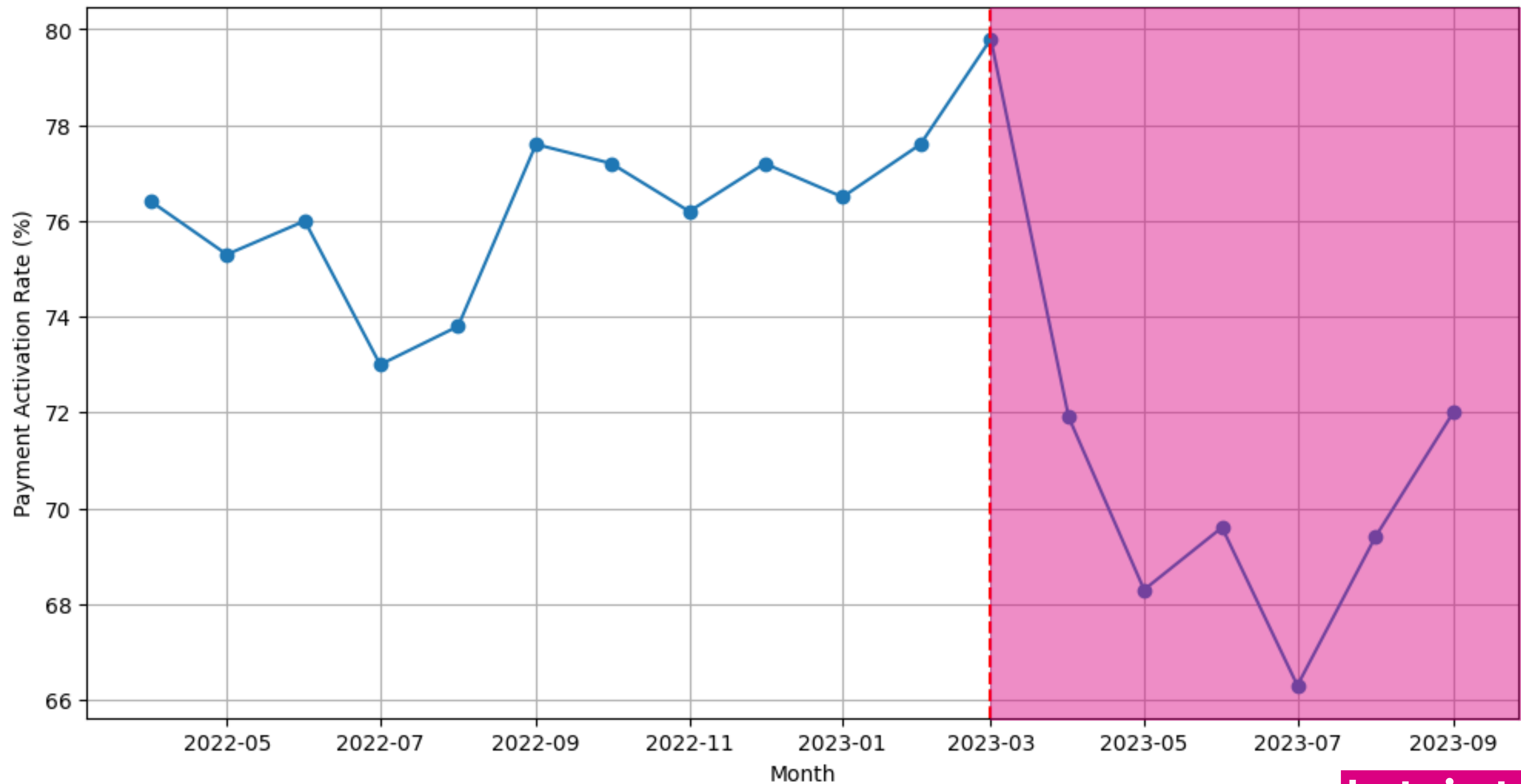
Evolution of the payment activation rate



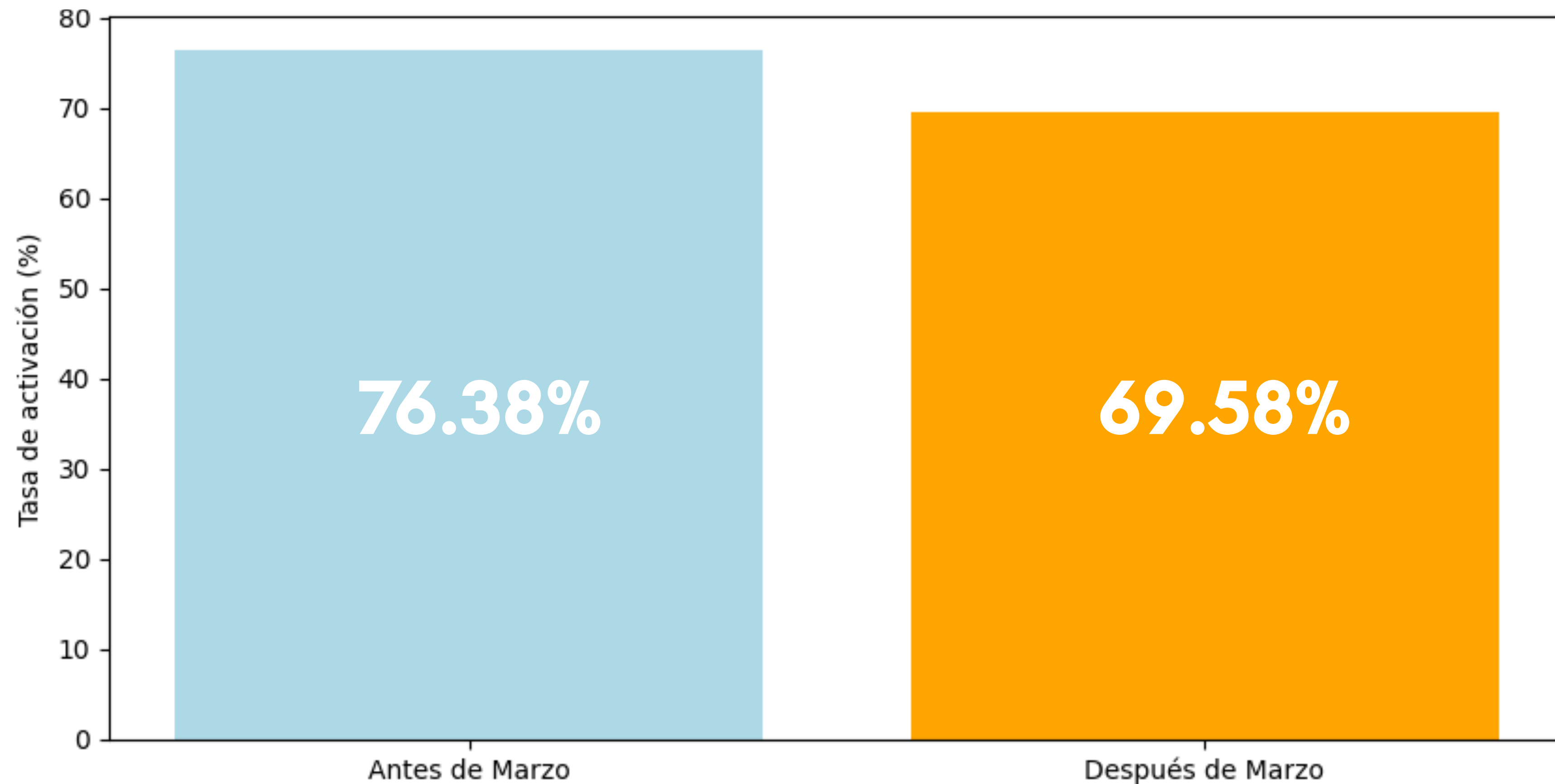
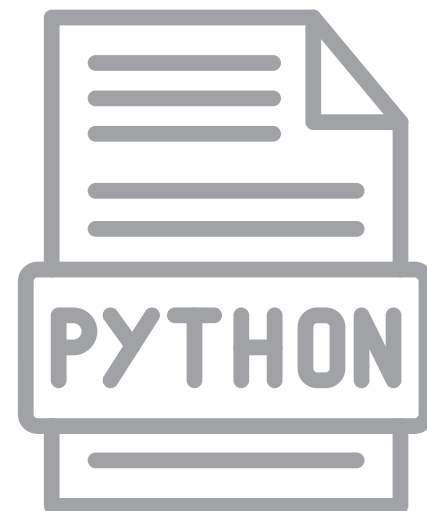
**Figure 1. Monthly evolution of Payment Activation rate**



# Evolution of Payment Activation Rate Over Time

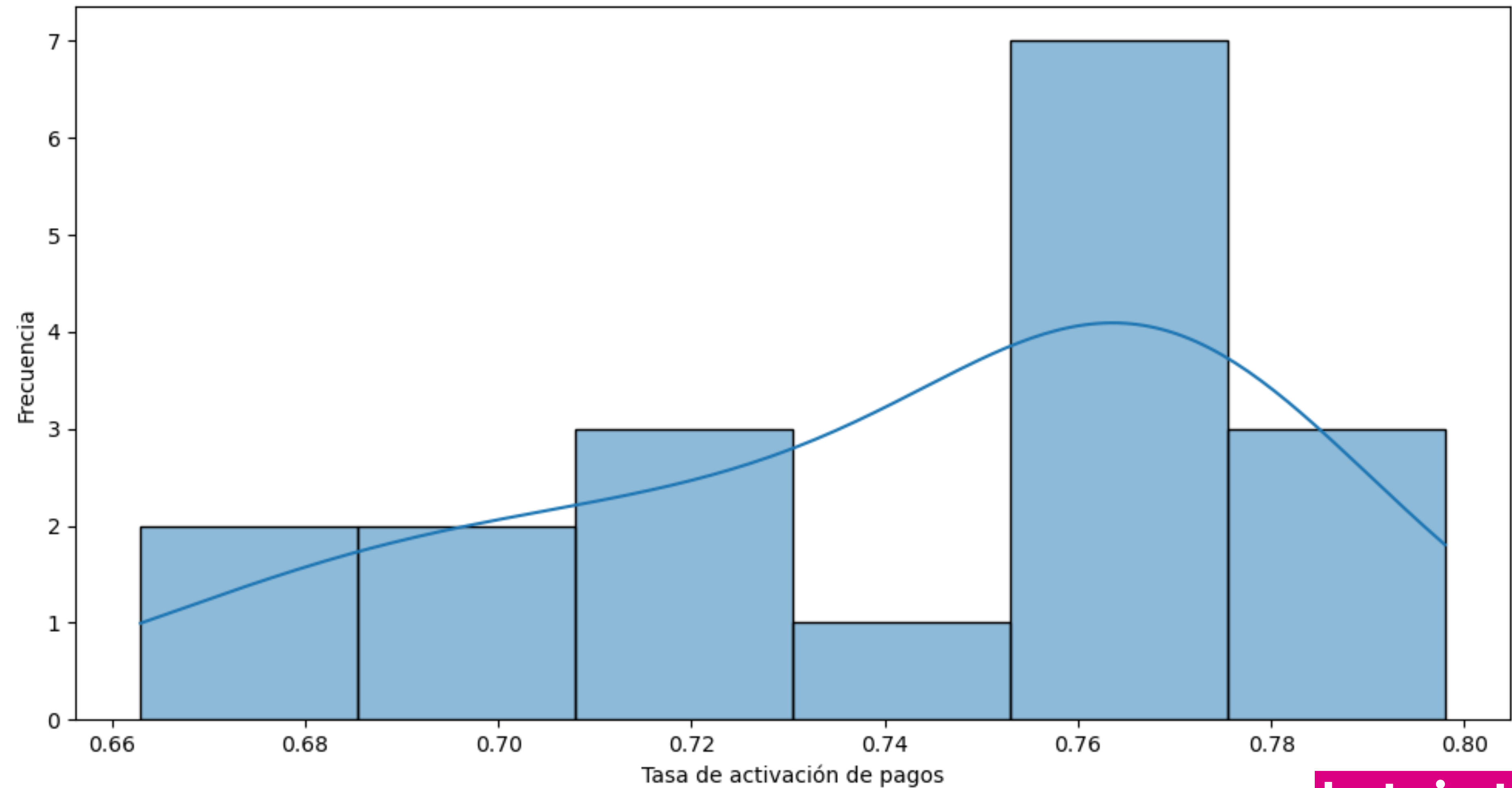
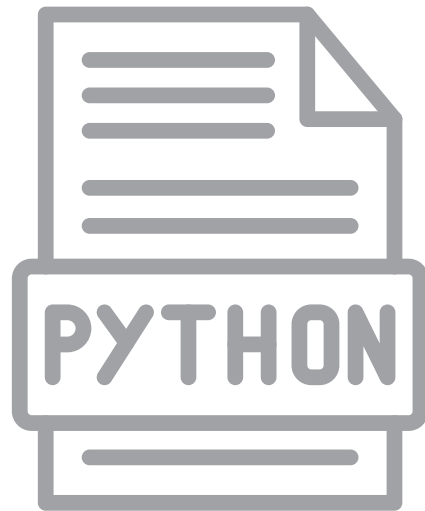


# Comparison of Payment Activation Rates Before and After the Change

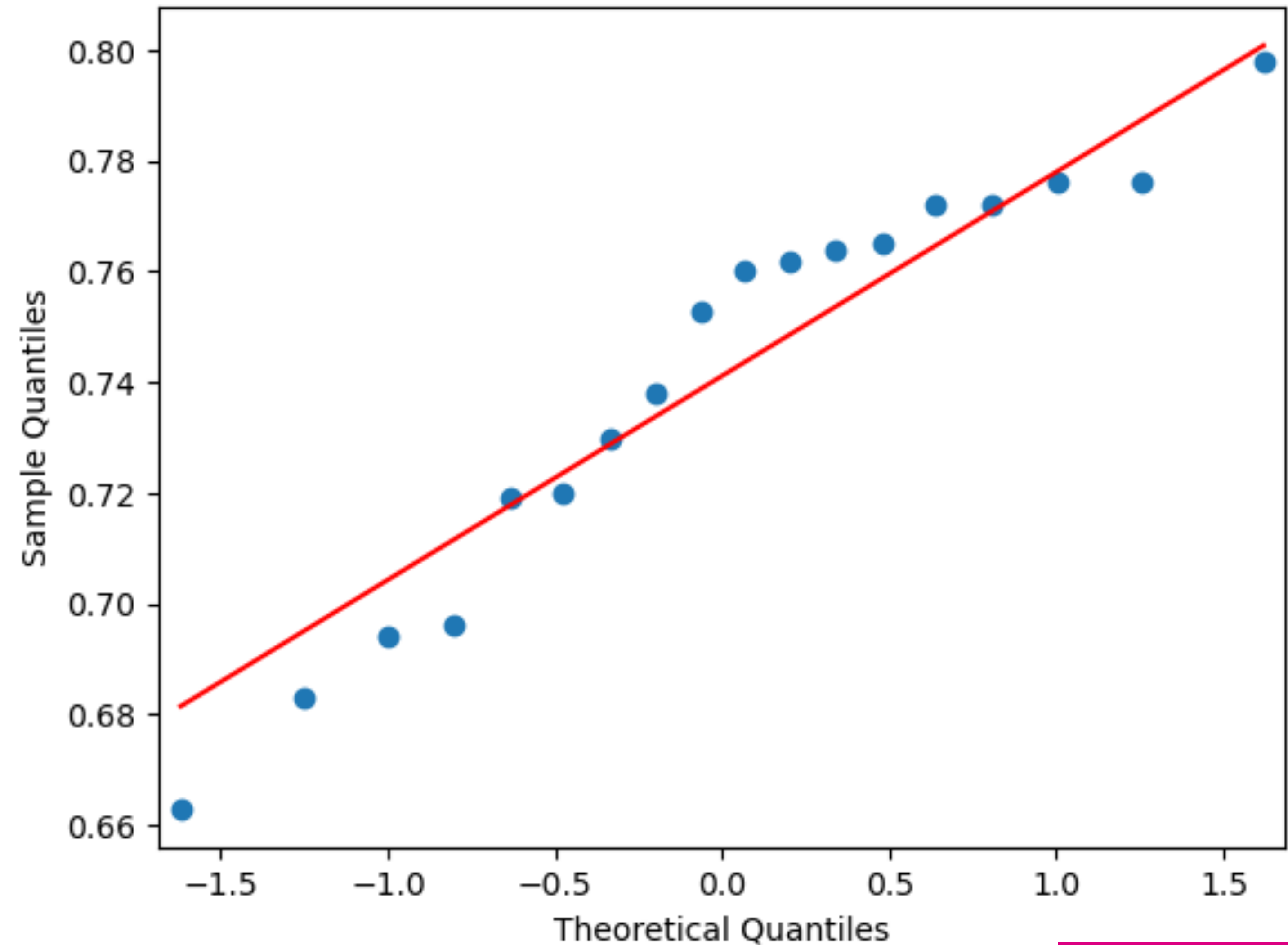




# Distribution of the Payment Activation Rate



# Q-Q Plot of the Payment Activation Rate





# Student's t-test

$$t\text{-statistic} = 3.5701110778261453$$

This value indicates the magnitude of the difference between the means of the two samples (before and after March 2023) in terms of the variability of the data.

$$p\text{-value} = 0.002555594283452994$$

This value indicates the probability of observing such an extreme (or more extreme) difference between the means of the two samples if the null hypothesis (that there is no difference) were true.

# Mann-Whitney U Test

U-statistic = 66.0

This value indicates the sum of the ranks assigned to the observations of one of the samples.

p-value = 0.014372029649340345

This value indicates the probability of observing such an extreme (or more extreme) difference in the distributions of the two samples if the null hypothesis (that there is no difference) were true.



# Interpretation

Both statistical tests (Student's t-test and Mann-Whitney U test) indicate that **there is a significant difference in the payment activation rates** before and after March 2023.

This suggests that the changes introduced in March 2023 (annual payment option and increased monthly payments) **likely influenced the observed decline in the payment activation** rate from April to August 2023.

# Question 3

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Potential impacts on revenue



# Positives

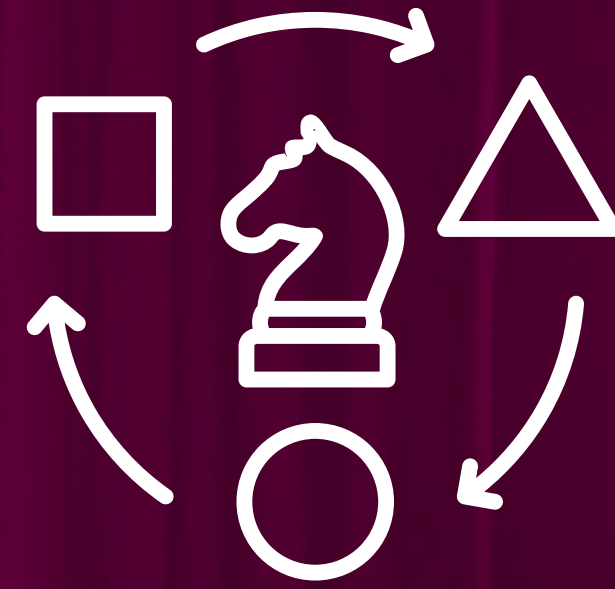
- ① Annual plans ensure stable income
- ② Higher average income per customer
- ③ Attract new customers with annual discounts

# Negatives 👎

- ❶ Loss of price-sensitive customers
- ❷ Liquidity problems
- ❸ High upfront costs



# Strategies



- 1 Offer **gradual discounts** to smooth the transition.
- 2 **Segment prices** to retain sensitive customers and attract premium.
- 3 Analyze **price elasticity to predict** how customers will react.

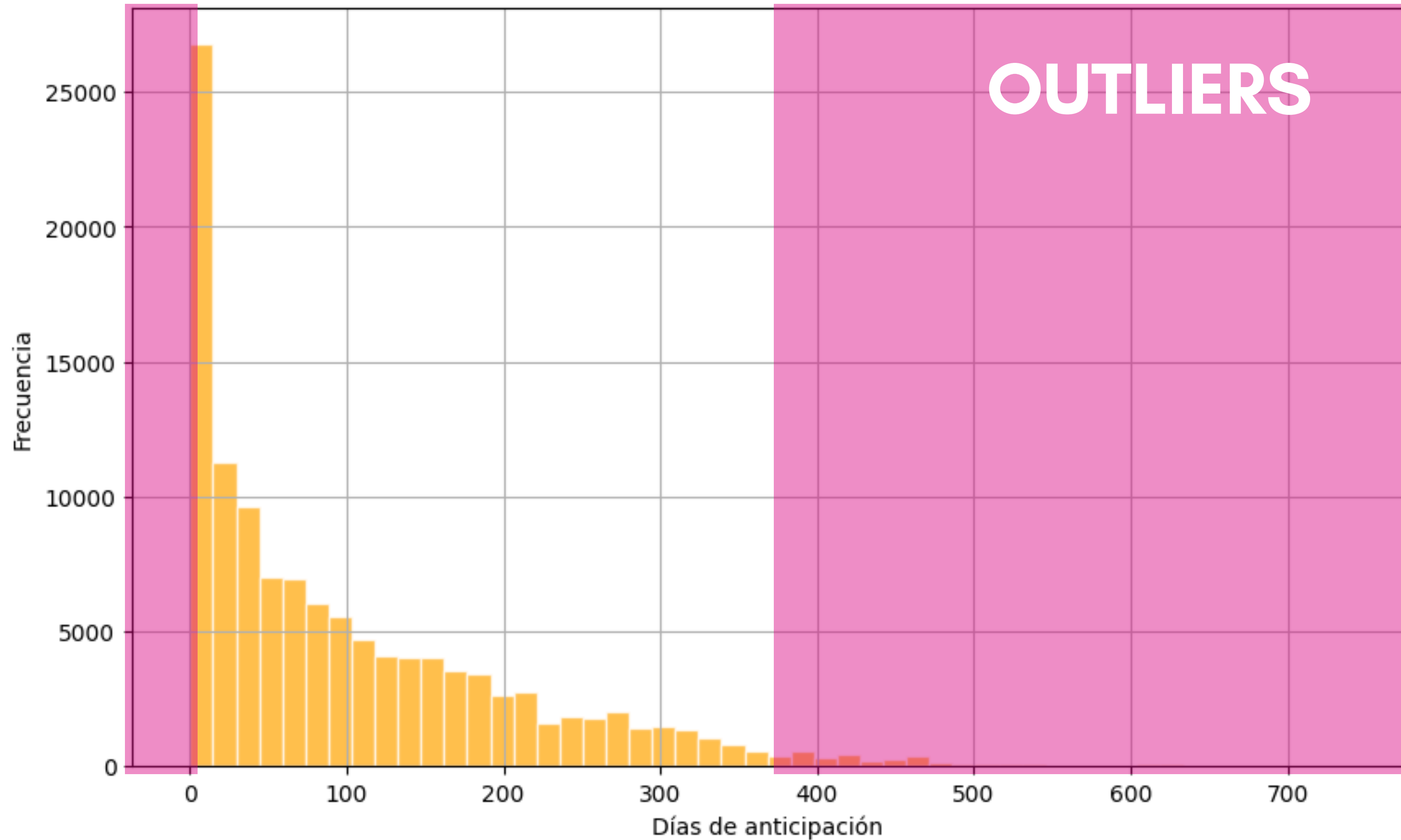
# Question 4

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Exploratory Data Analysis

# Advance booking time distribution

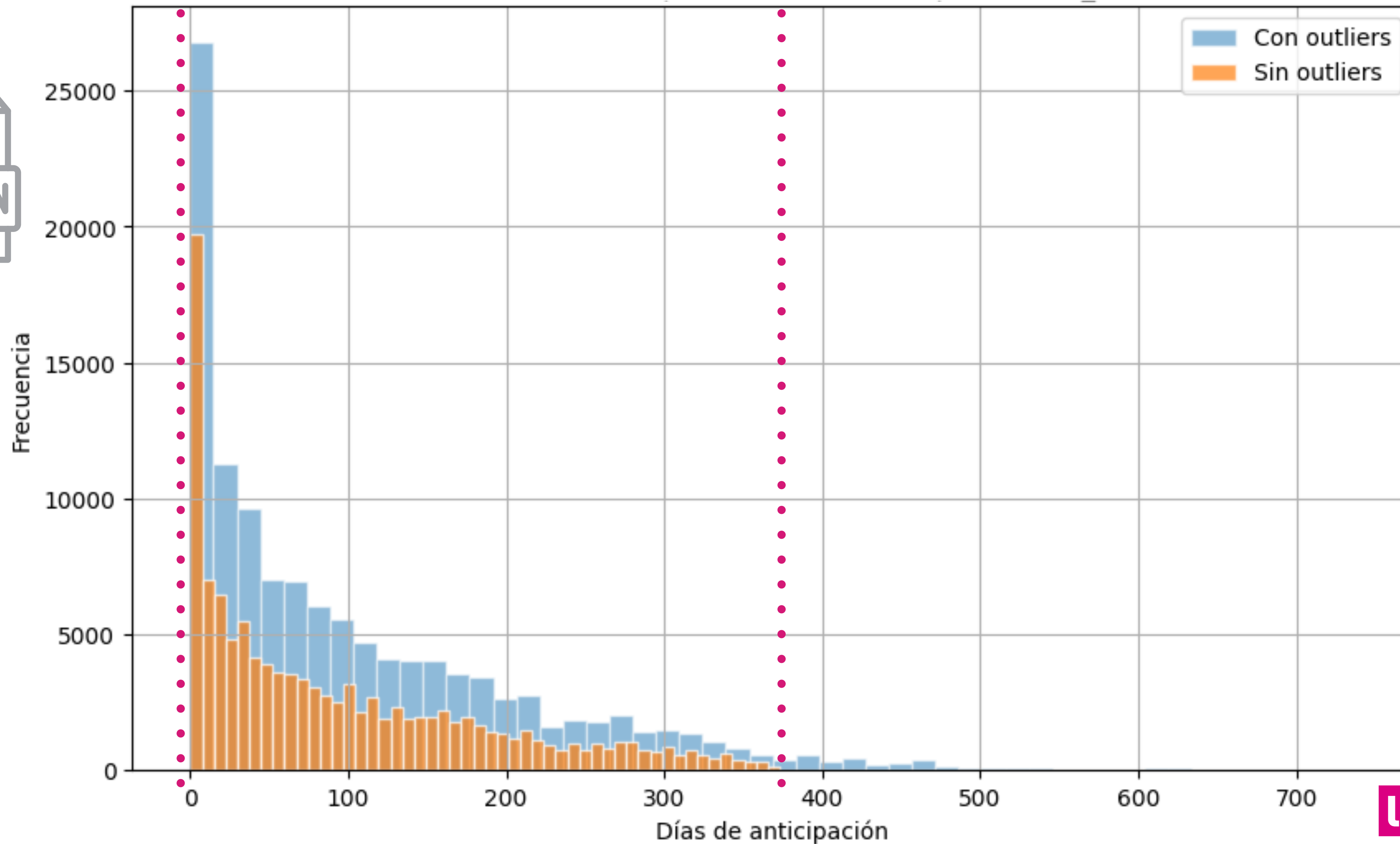
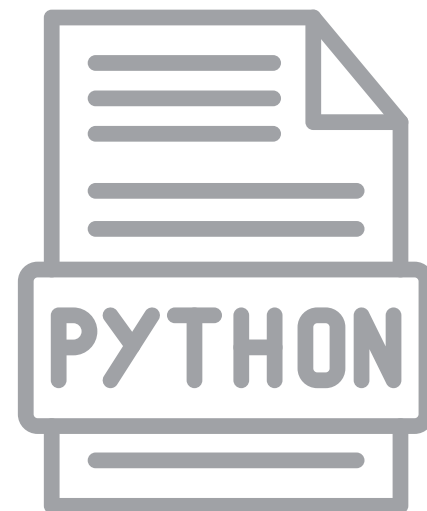
lean\_time





# Advance booking time distribution

lean\_time



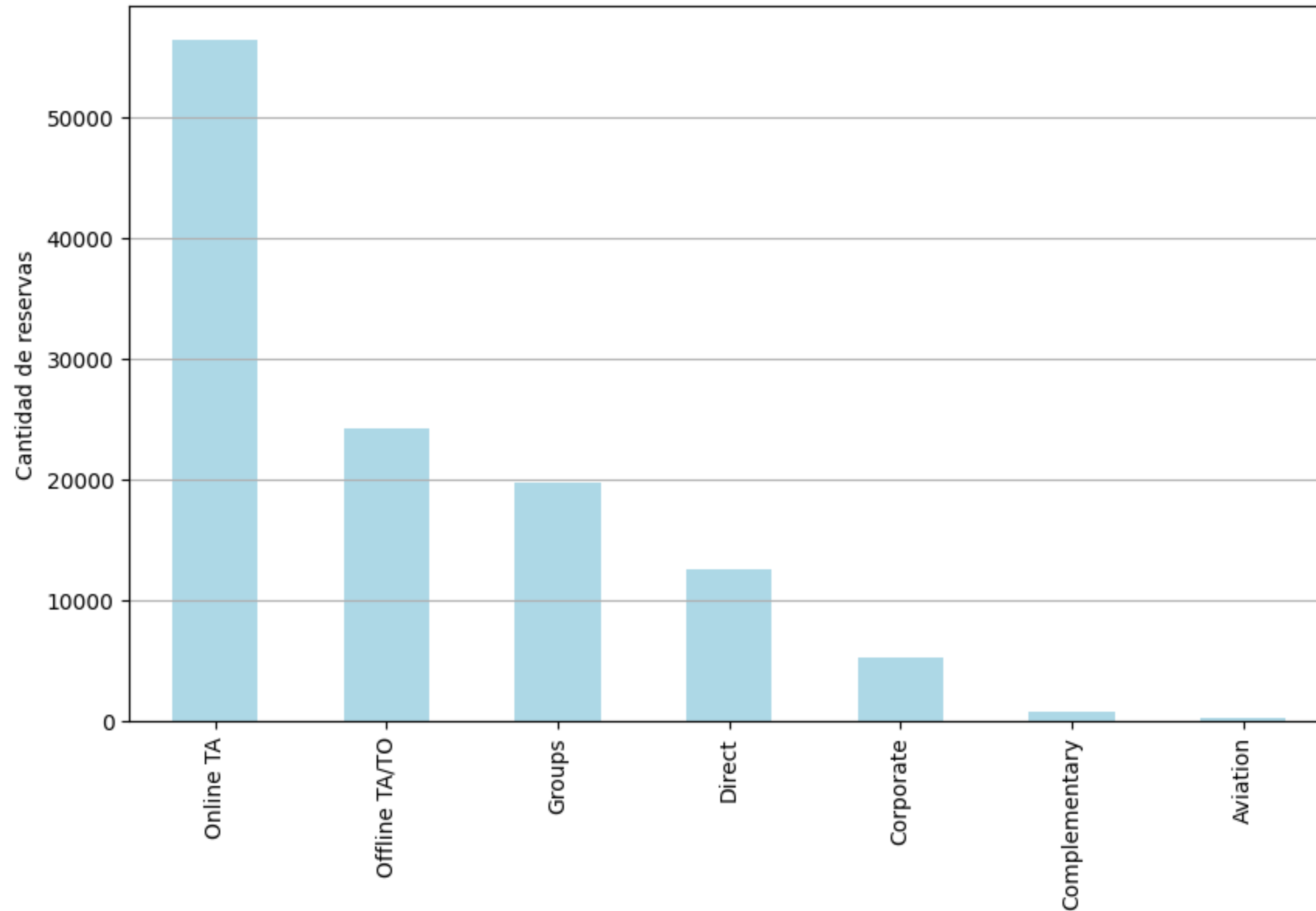
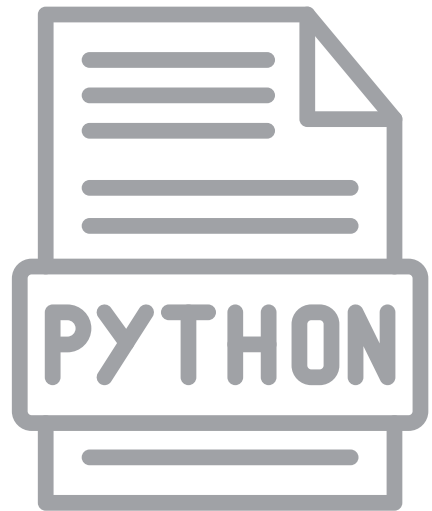
# Advance booking time distribution

lean\_time

**lead\_time** We observe that most bookings are made with less than 200 days of anticipation.

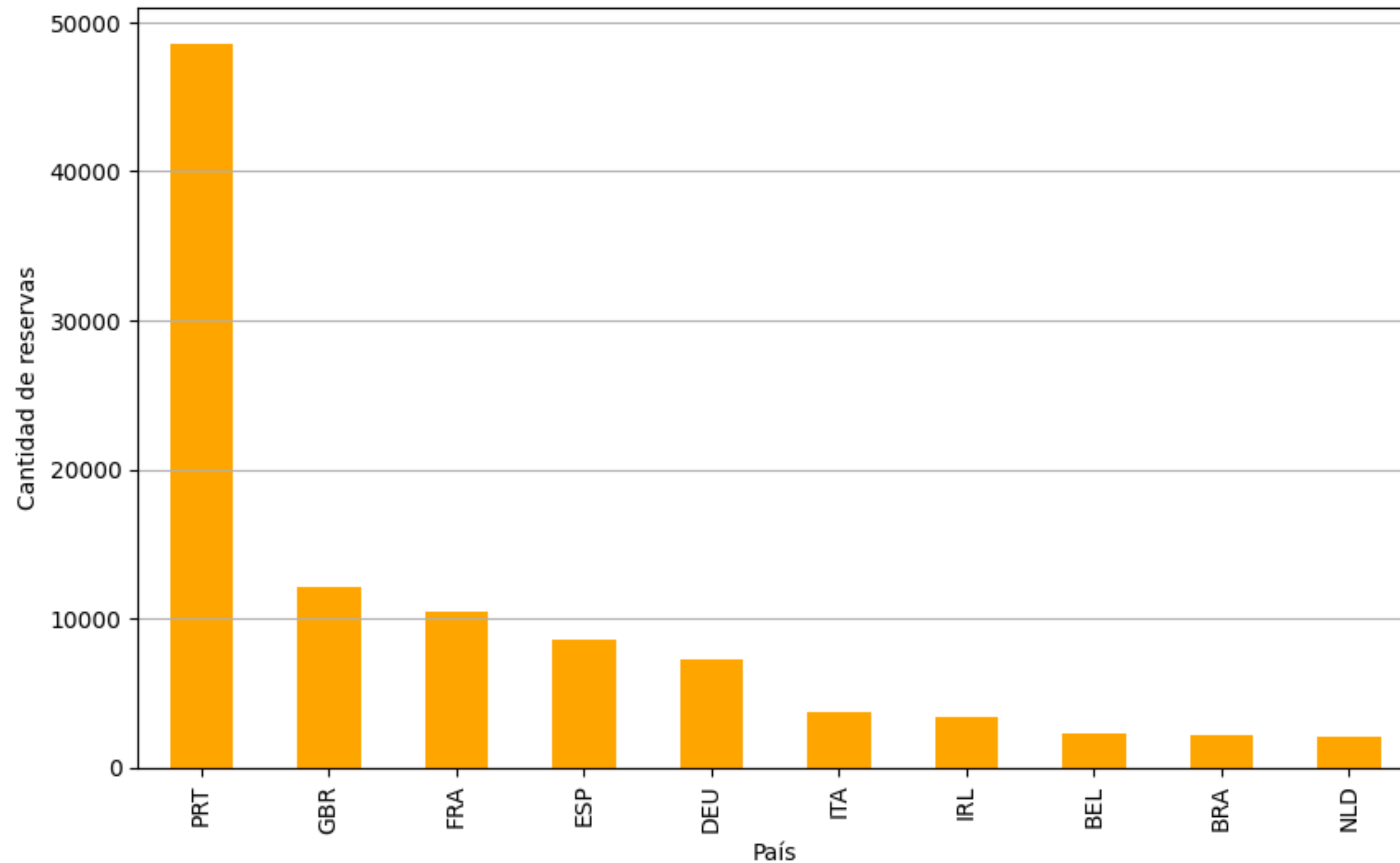
**Outliers** The distribution without outliers is more concentrated and better represents the majority of bookings.

# Market segments





# Main Countries of Origin for Guests



# Market segments

## Online TA 47.30%

Most customers come from online travel agencies like Booking.com, Expedia, etc. This figure reflects the importance of the digital market. A strong strategy on online platforms has a direct impact on revenue.

## Offline TA/TO 20.28%

A significant portion of bookings is made through traditional travel agents or operators. These segments are more traditional but stable, making them ideal for ensuring occupancy during low seasons.

## Groups 16.59%

Group bookings ensure a high occupancy volume, which helps maximize resources such as catering, transportation, and services.



# THANKS

Do you have any questions?

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