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BUSINESS CASE

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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

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Question 1

Identifying suspicious patterns

(possible attempts to avoid paying commission fees)

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1
A reservation
is cancelled
2
Shortly after:
New manual
reservation is made
3
The new manual reservation:
same hotel
same check in
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```sql
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')
```


```sql
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

Evolution of the payment activation rate

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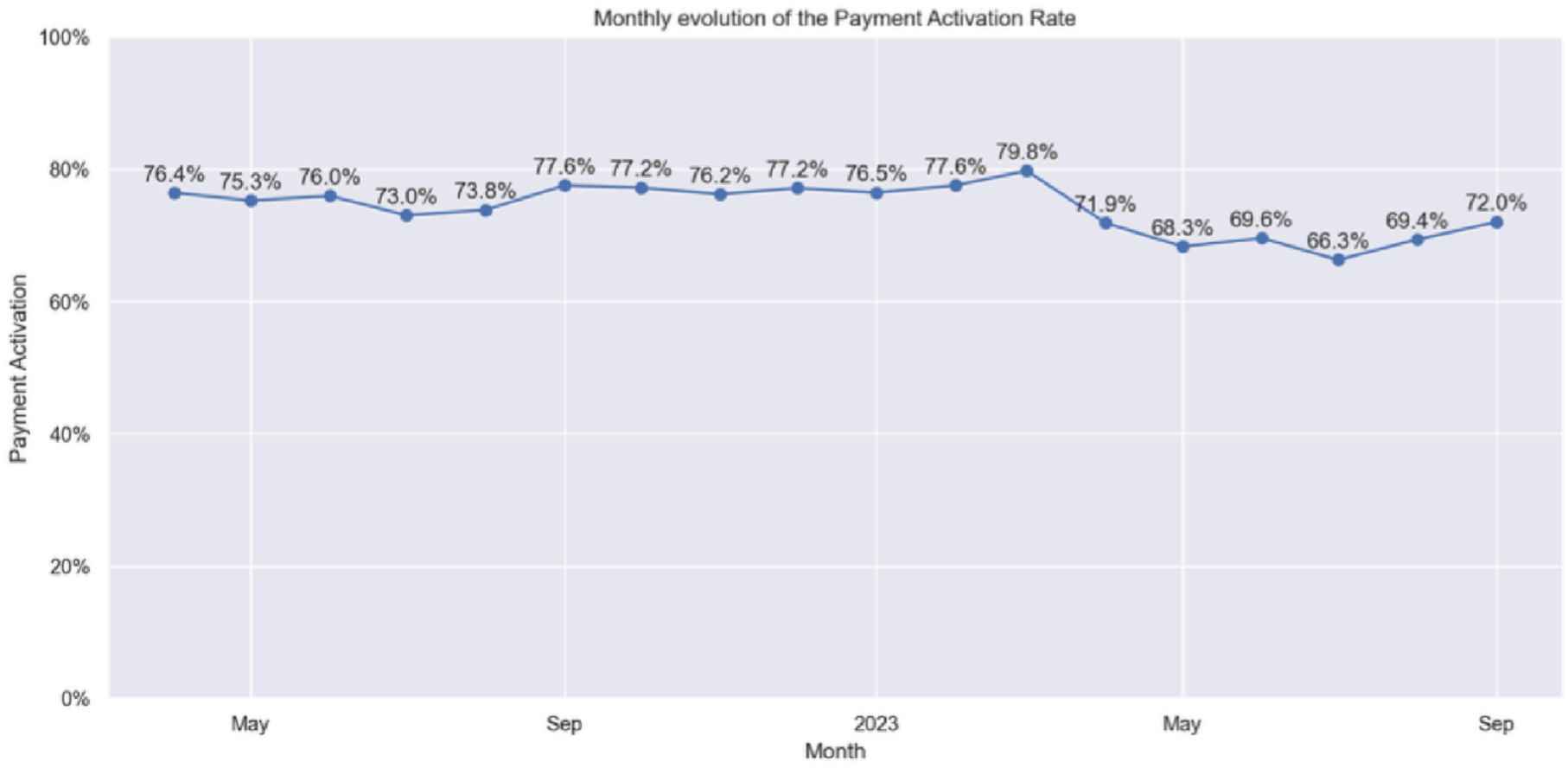
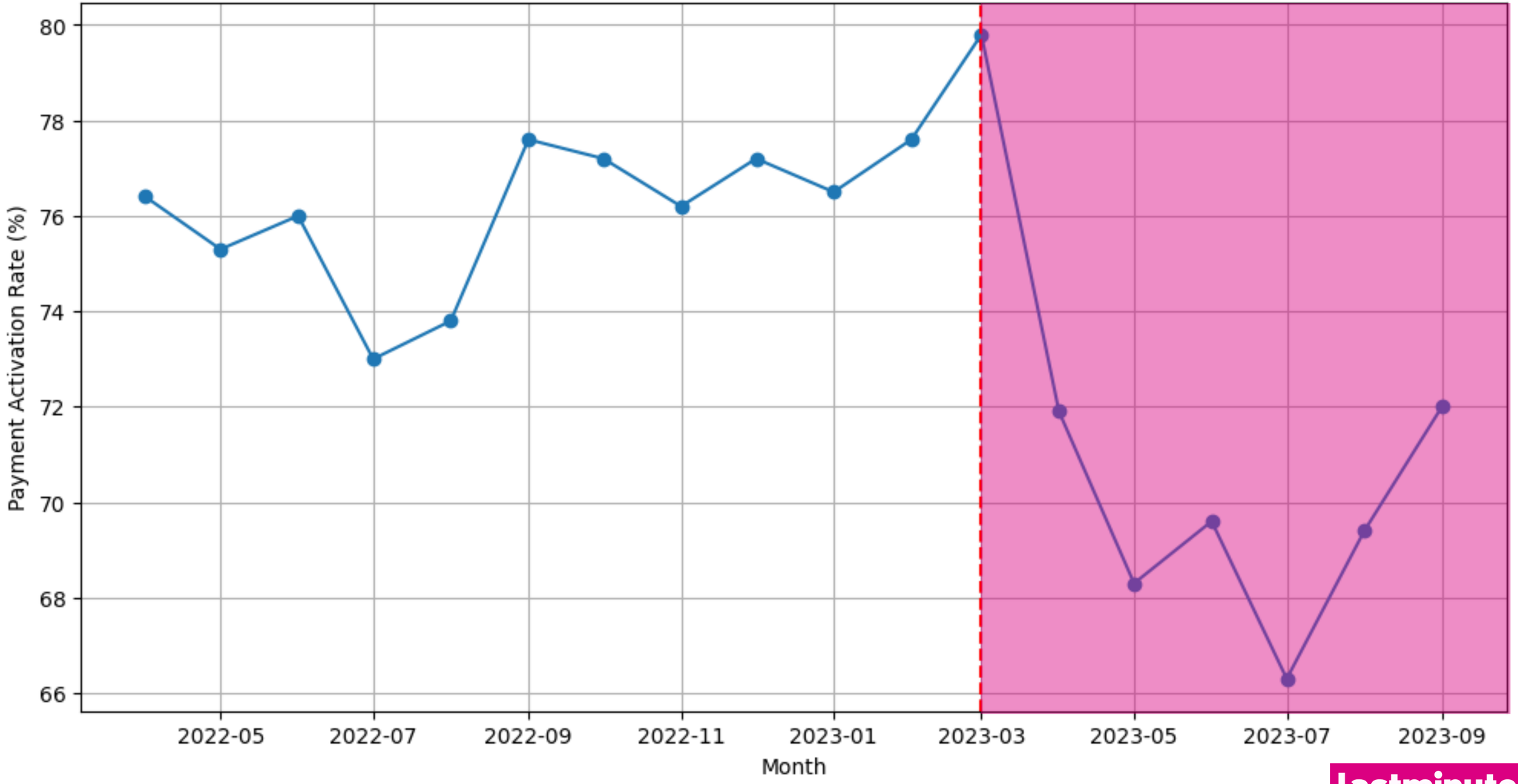


Figure 1. Monthly evolution of Payment Activation rate

Evolution of Payment Activation Rate Over Time



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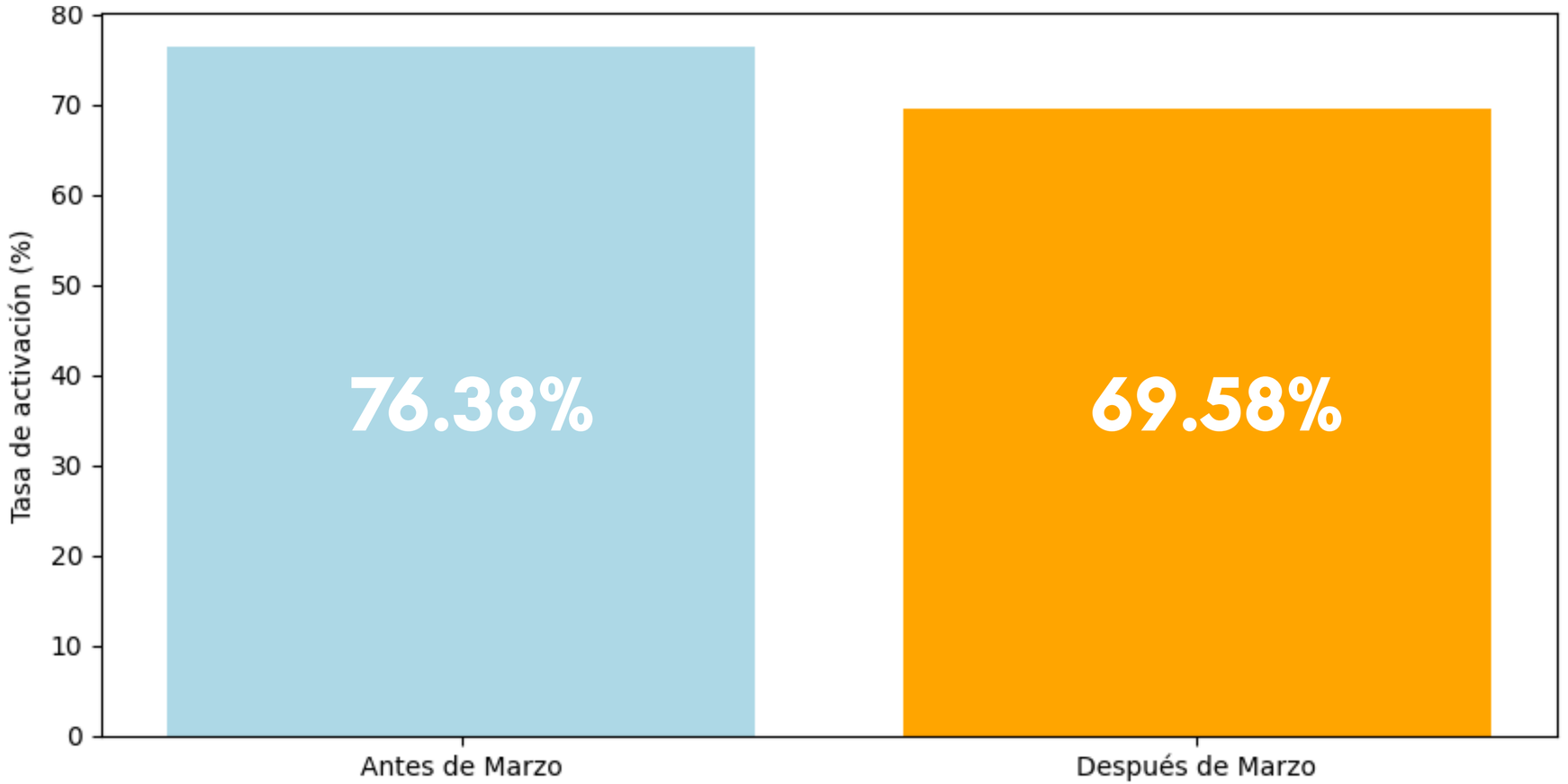
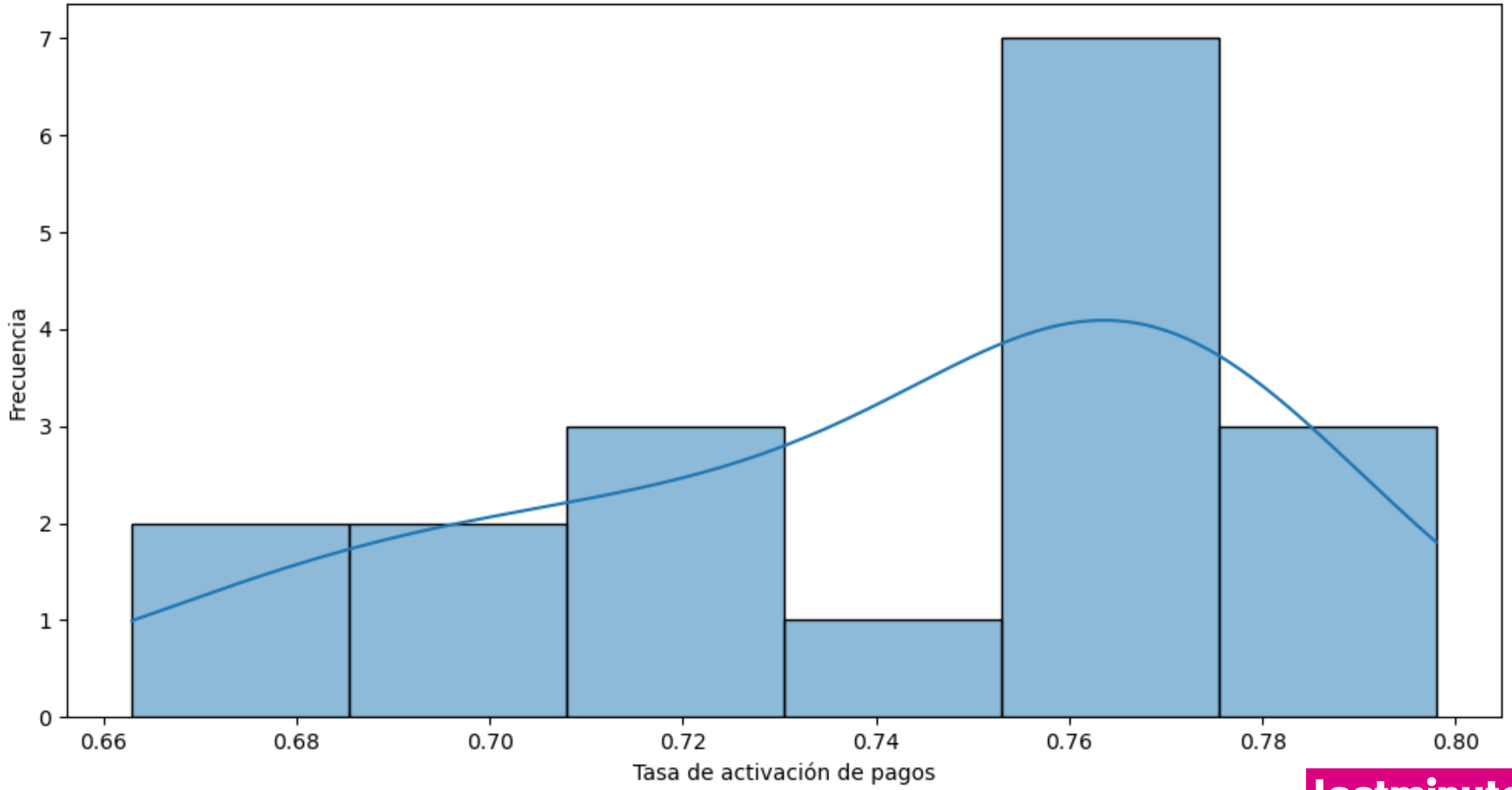
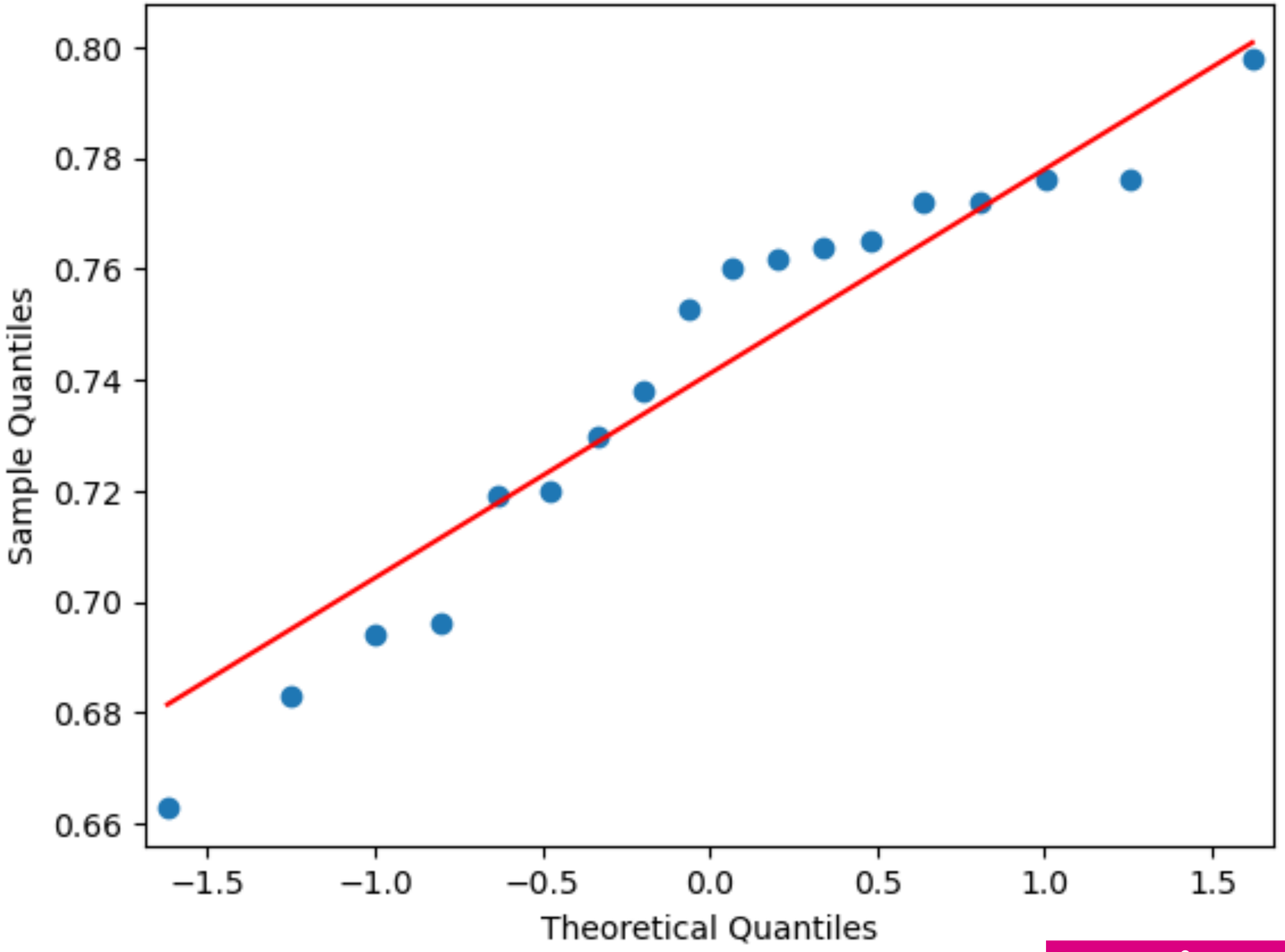
Comparison of Payment Activation Rates Before and After the Change



Distribution of the Payment Activation Rate



Q-Q Plot of the Payment Activation Rate



Student's t-test

t-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-value = 0.0025555942834529 94

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

Potential impacts on revenue

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Positives

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

Negatives 👎

1. Loss of price-sensitive customers
2. Liquidity problems
3. High upfront costs

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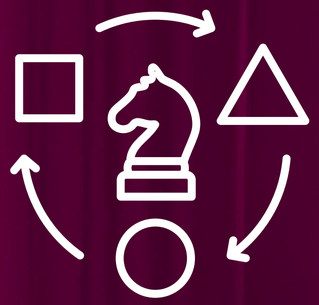
Strategies 

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.

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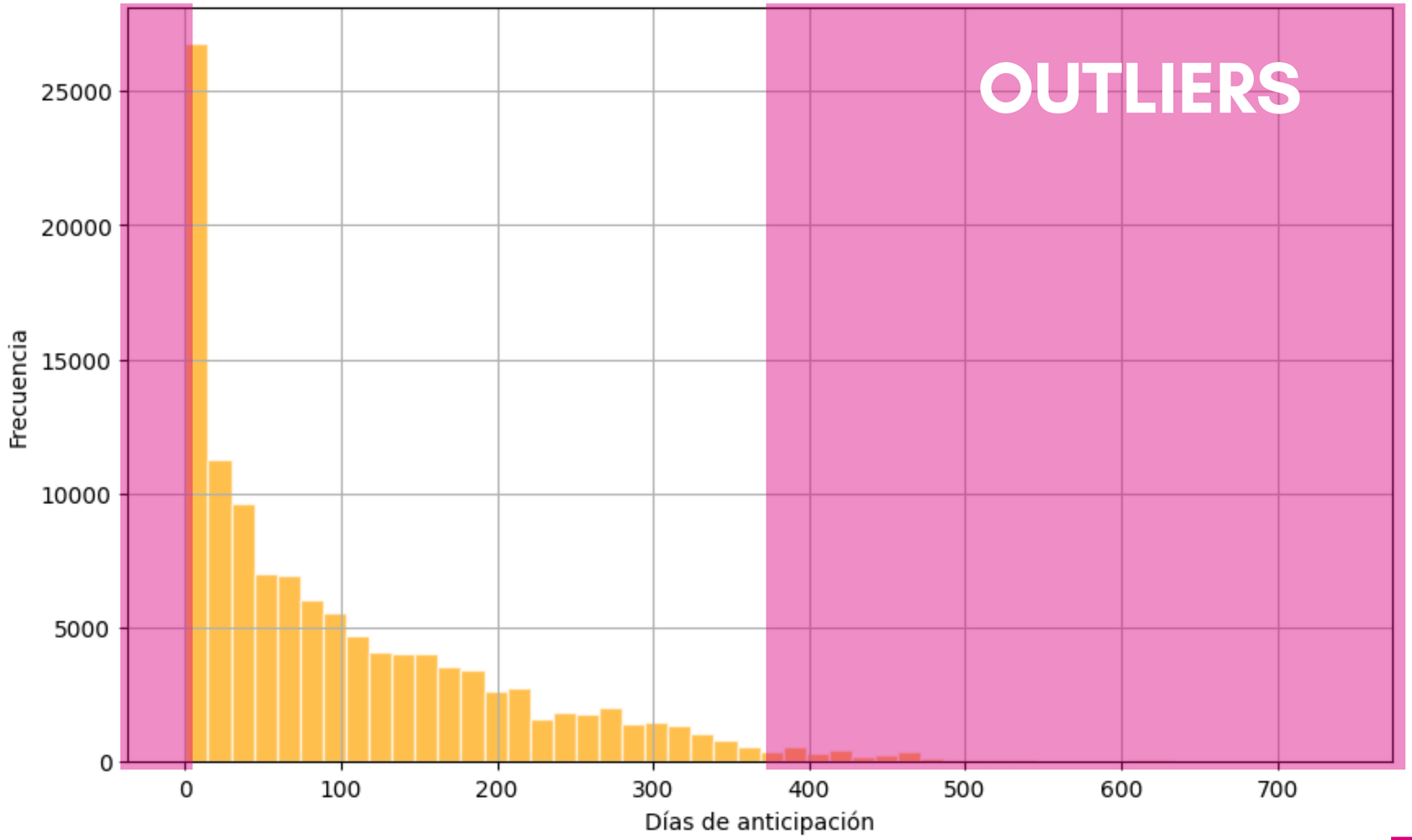
Question 4

Exploratory Data Analysis

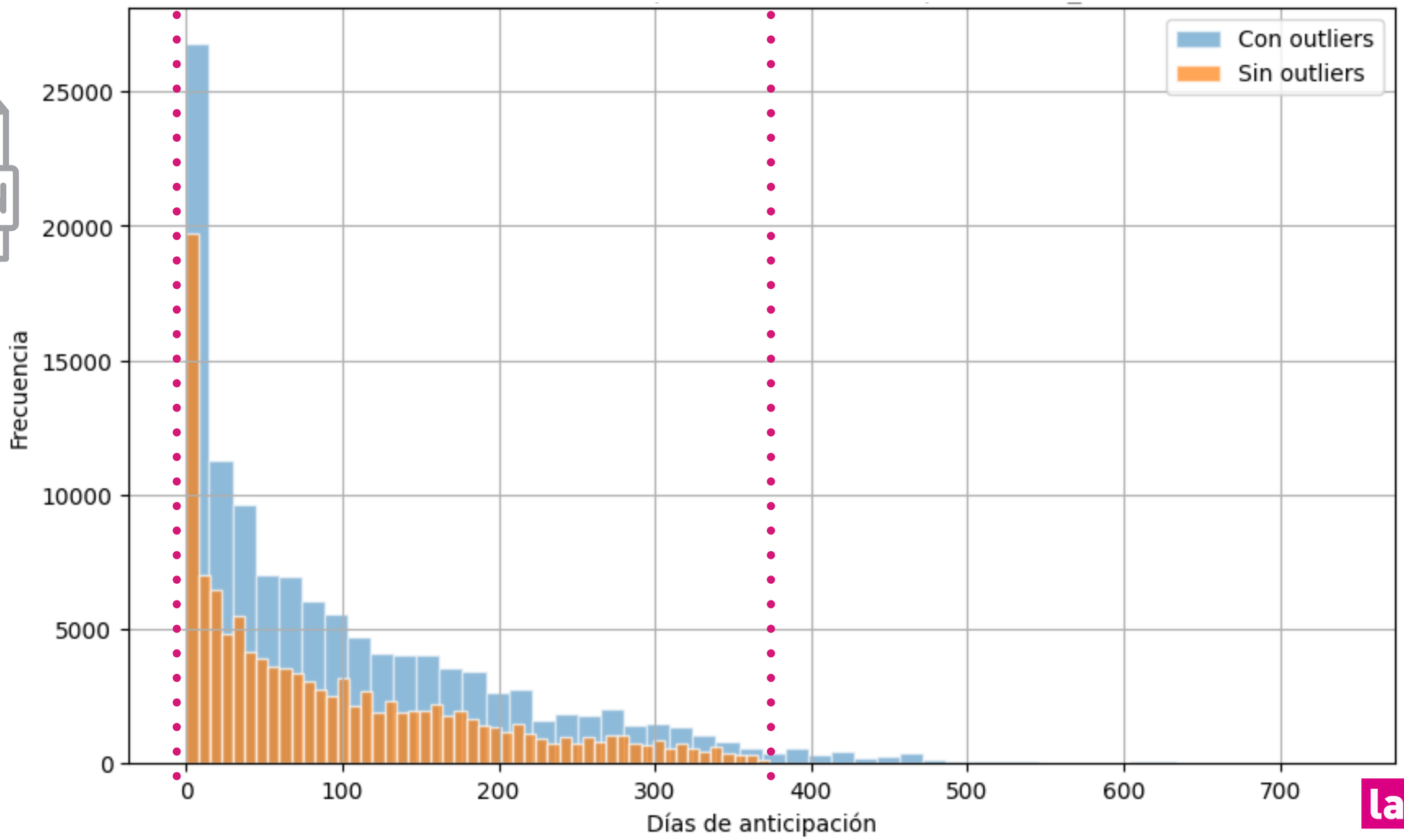
Advance booking time distribution

lean_time



Advance booking time distribution

lean_time



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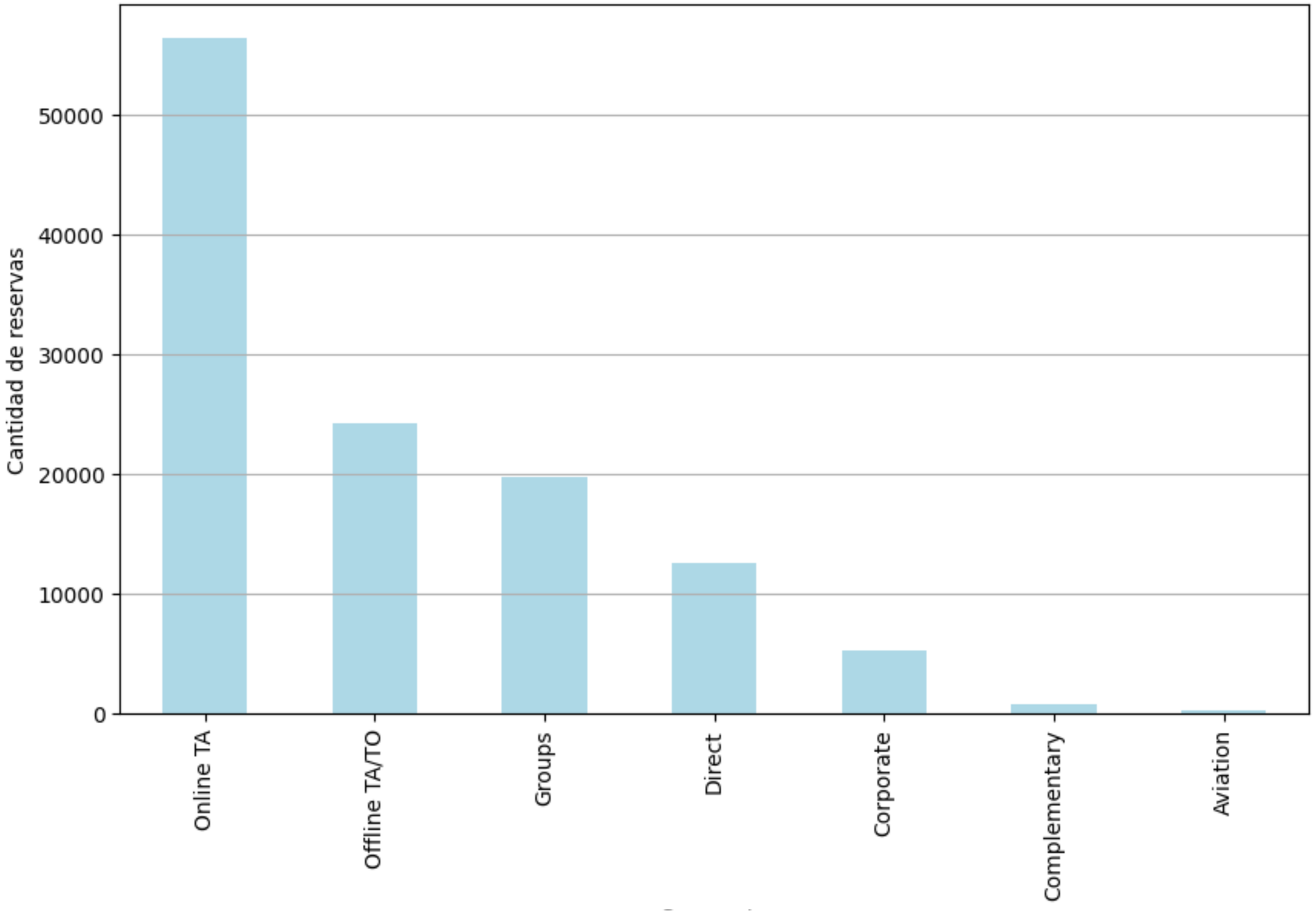
Advance booking time distribution

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



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.

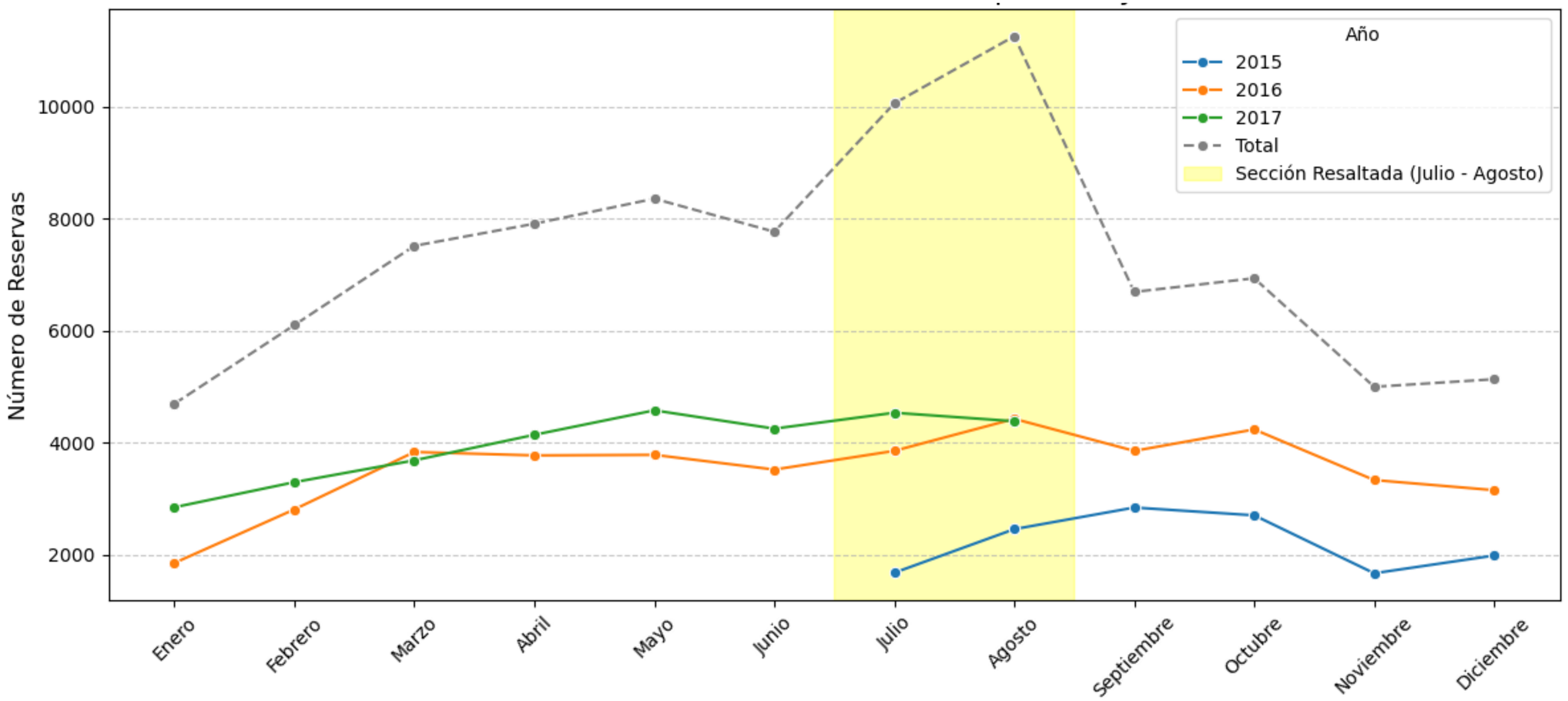
Offline TA/TO 20.28%

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.

Monthly Booking Distribution by Year



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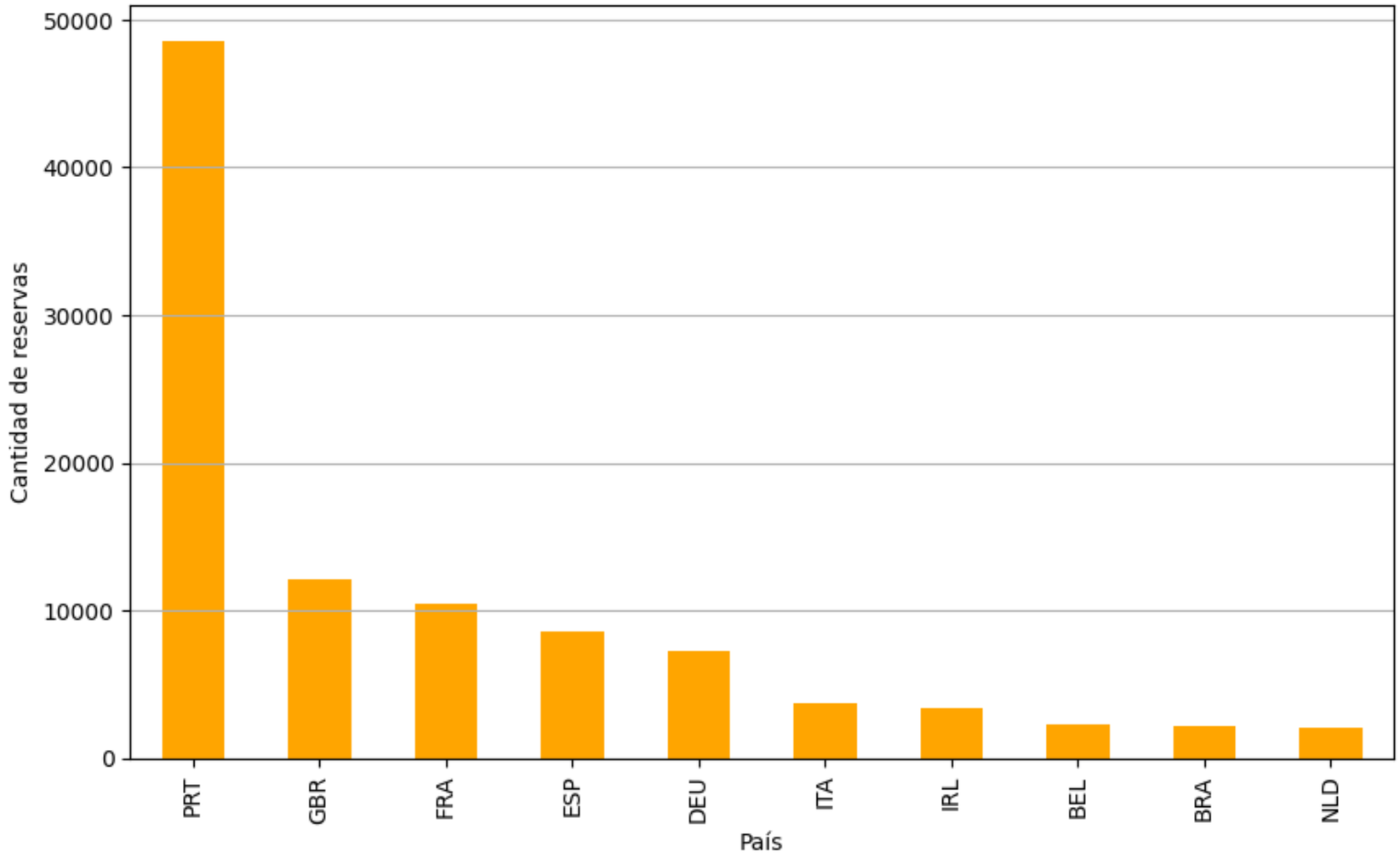
Main Countries of Origin for Guests



THANKS

Do you have any questions?

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