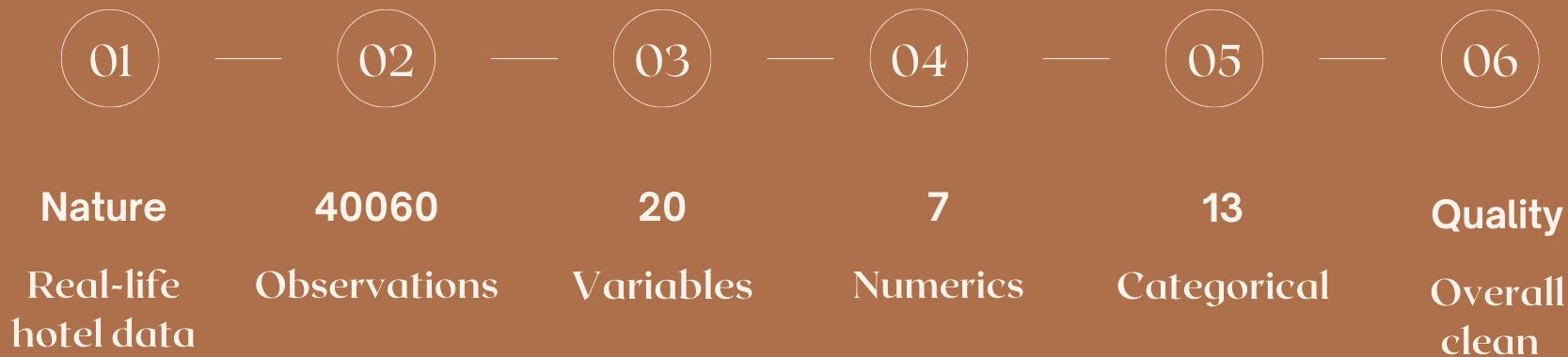# Hotel Cancellations
Team 4

Asim Kazi, Kevin Harmer, Megha Banerjee, Pranav Sharma, Shruti Varma

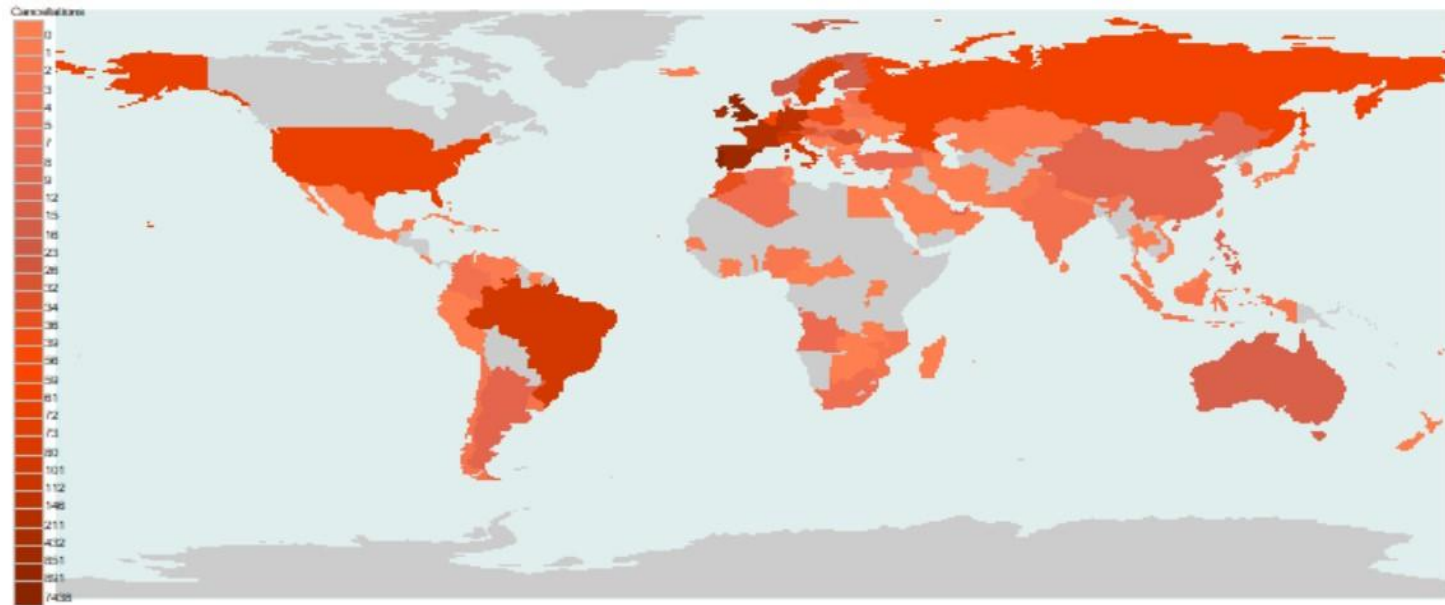# Objective

01 To minimize the hotel booking cancellations.

02 To find out instances that are more likely to get cancelled.

03 To understand some key drivers for hotel cancellations

04 Avoid predicting cancellations of people who end up staying with their hotel reservation

Preliminary Analysis

01 — **02** — **03** — **04** — **05** — **06**

Nature

Real-life hotel data

40060

Observations

20

Variables

7

Numerics

13

Categorical

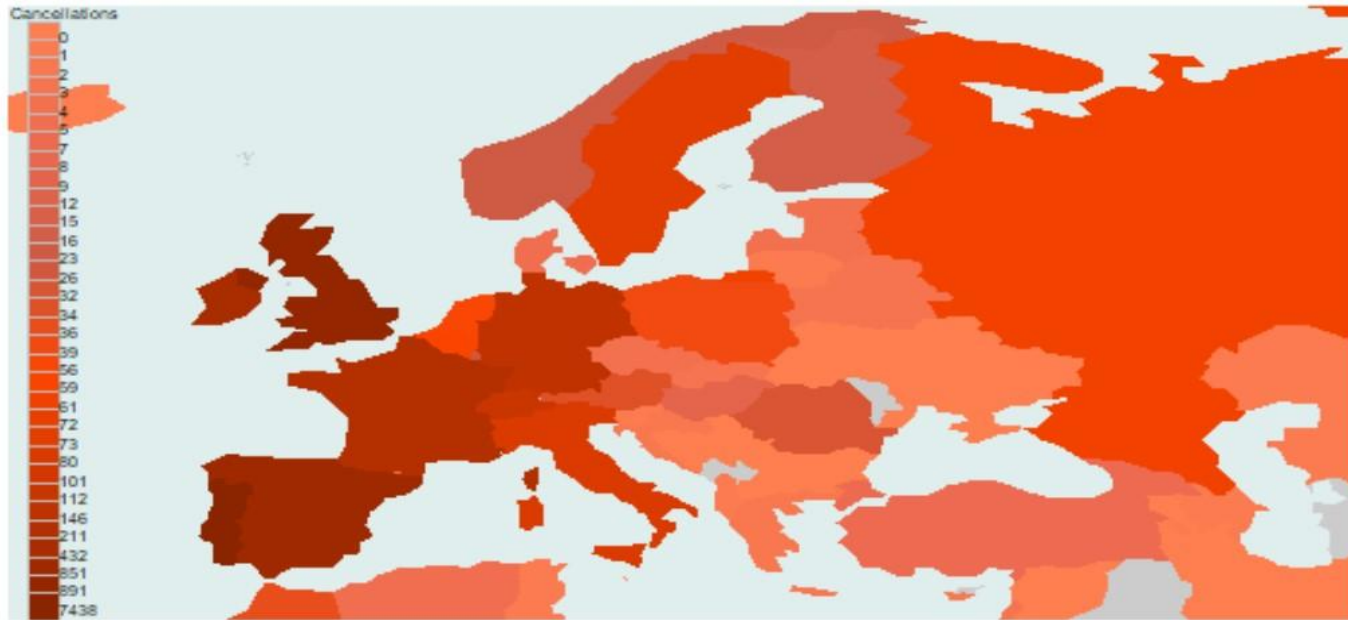**Quality**

Overall clean

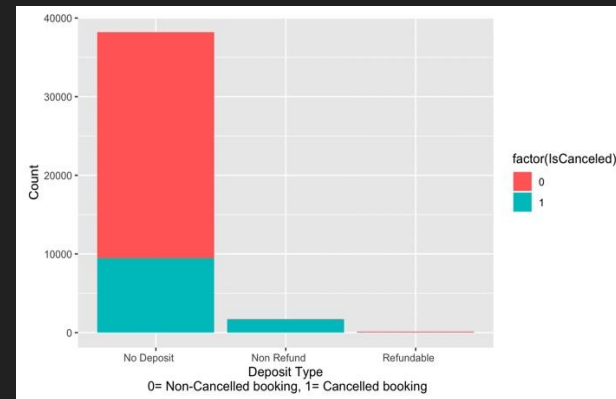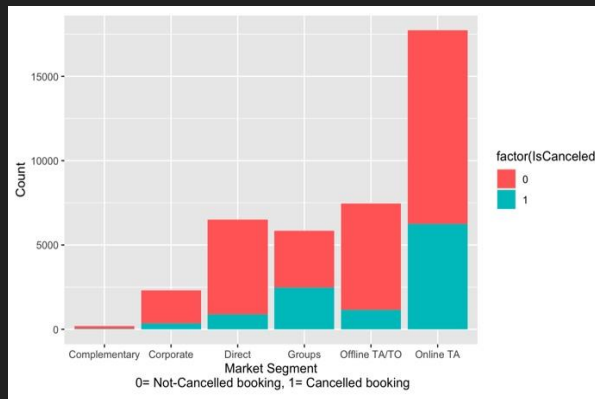# Looking at the Data

Geographical Information on Countries that cancelled Bookings

Looking at the Data

Geographical Information on Europian Countries that cancelled Bookin[...]

Looking at the Data

- Around 72% of the data accounts for Non-cancelled bookings where 28% is for the cancelled bookings.
- 40% group bookings and 35% bookings via online tour agents got cancelled.
- Around 96% Non refundable bookings got cancelled.
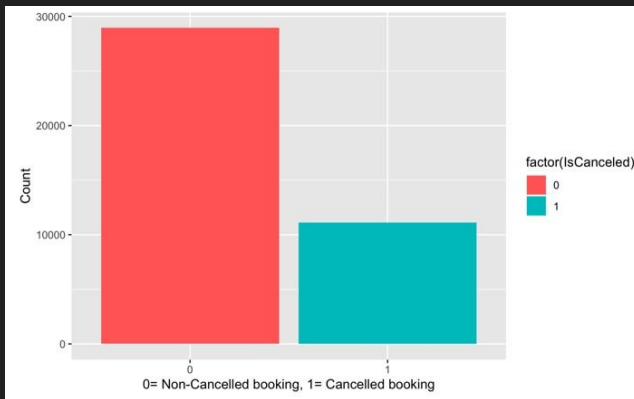
Numerical Analysis

- ✓ **01** 7 out of 20 variables are numerics

- ✓ **02** We split the dataset

- ✓ **03** Cancellations and Stays

- ✓ **04** Why: Easier to spot differences

- ✓ **05** Findings: Lead time was the strongest difference

Looking at the Data
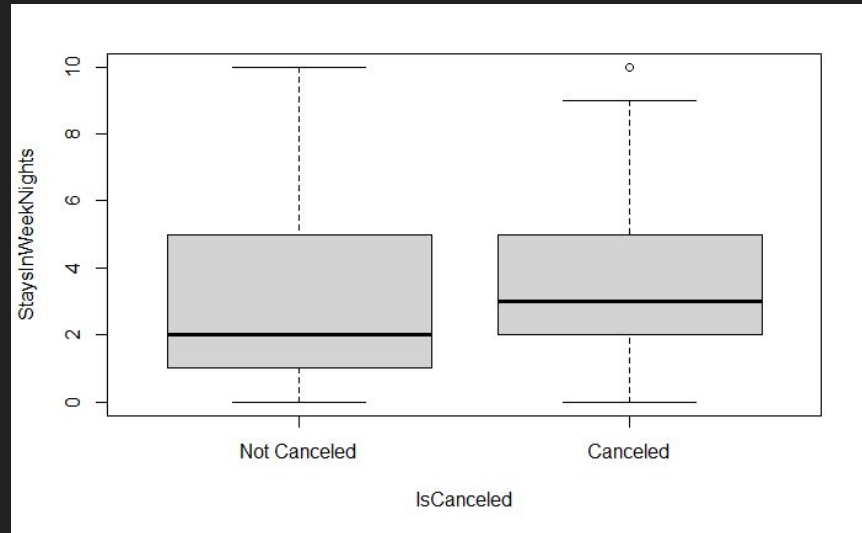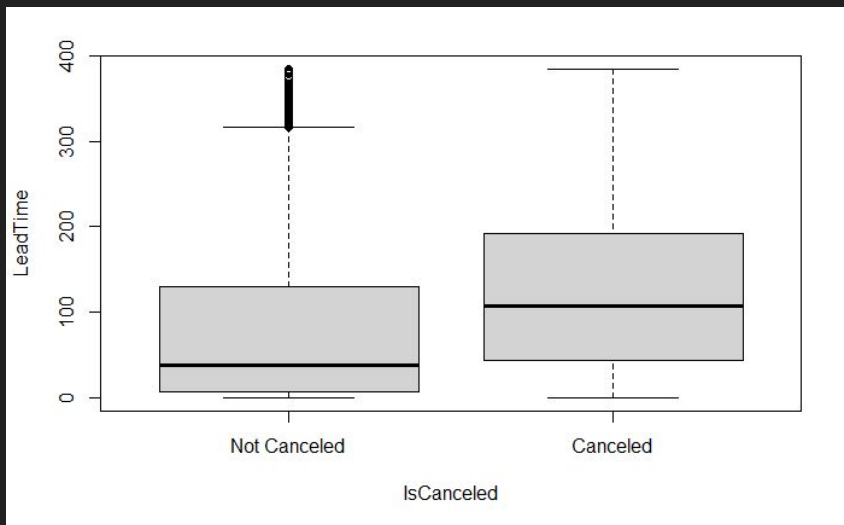
Lead time, Stays in Week Nights, and other variables are different for cancellations and non-cancellations.

Predictive Model

01   Uses the Lead Time, Stays in Week Nights, Stays in Weekend Nights, Previous Cancellations, Previous Bookings Not Canceled, Booking Changes, and Number of Required Parking Spaces of customers to predict if they would cancel

02   Predicted 74.2% of the data correctly (canceled and not canceled; only 2.16% better than traditional method)

03   Model predicted customers that did not cancel their reservation with 99.9% accuracy; 98.6% of predicted cancellations actually canceled

04   Important to not predict cancellations of customers who make their reservation so that their room will still be available.

Association Rule Mining
(Instances likely to get cancelled)

- If the Deposit Type is Non Refund and Customer Type is Transient, then the booking is most likely to get cancelled.

LHS	RHS	support	confidence	coverage	lift
All	All	All	All	All	.
{DepositType=Non Refund,CustomerType=Transient}	{IsCanceled=1}	0.040	1.000	0.040	3.60
{MarketSegment=Groups,PreviousCancellations=1,BookingChanges=0}	{IsCanceled=1}	0.009	1.000	0.009	3.60
{MarketSegment=Groups,PreviousCancellations=1,RequiredCarParkingSpaces=0}	{IsCanceled=1}	0.009	1.000	0.009	3.60
{MarketSegment=Groups,IsRepeatedGuest=0,PreviousCancellations=1}	{IsCanceled=1}	0.008	1.000	0.008	3.60
{MarketSegment=Groups,DepositType=Non Refund,CustomerType=Transient}	{IsCanceled=1}	0.036	1.000	0.036	3.60
{StaysInWeekNights=3,DepositType=Non Refund,CustomerType=Transient}	{IsCanceled=1}	0.009	1.000	0.009	3.60
{StaysInWeekNights=2,DepositType=Non Refund,CustomerType=Transient}	{IsCanceled=1}	0.013	1.000	0.013	3.60
{Meal=HB,DepositType=Non Refund,CustomerType=Transient}	{IsCanceled=1}	0.011	1.000	0.011	3.60

Factor Model
(SVM Method)

✓ **01**   Used all of the variables aside from Lead Time, Stays in Week Nights and Stays in Weekend Nights

✓ **02**   Predicted data with 85.75% accuracy (13.72% better than traditional method)

✓ **03**   Predicted 90.5% of non-cancellations correctly

✓ **04**   Incorporation of this model would need some extra rooms available for the 9.5% of people who are predicted to cancel but do not end up canceling

Suggested Actions

01 Use the numerical model to check data. If the model predicts any customer canceling, they will most likely cancel. Keep one extra room for the 1.4% of cases when the model is wrong.

02 More cancellations are by Europeans, so reach out to them in advance to check if they still plan on using their reservation.

03 When people make an effort to change their bookings greet them with more importance because it shows inclination towards coming to stay at the hotel. Which means there is less chance of cancellation

Suggested Actions

☑ **04** Use the factor model, but reach out to predicted cancellations to check if they are keeping their reservations.

☑ **05** When a non refundable booking is getting cancelled, allow the customers to book again within a certain period of time, for a nominal charge.

Future directions

✅ **01**   Would like to perform Sentiment Analysis of the reviews and suggestion data of the guest.

✅ **02**   The idea where bookings are being cancelled even though there is no refund for the bookings is a unusual thing to see.