Ocean Crest Resorts and Hotels

Tim Jones, Roman Lytovchenko, Soryn Lurding

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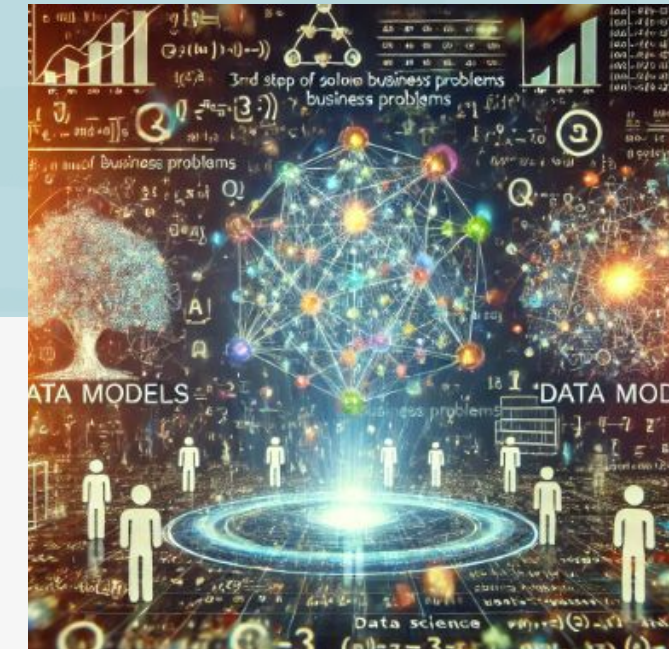# The Business Problem

- Booking cancellations reduce revenue and lower occupancy rates, posing a significant challenge for Ocean Crest Resorts & Hotels.

- Our data-driven strategy aims to identify key predictors of cancellations, segment customers, and create personalized marketing approaches that enhance customer retention.

- By leveraging customer behavior analytics, we will help Ocean Crest increase profitability and solidify its market position through improved operations and targeted solutions.

Key Findings & Recommendations
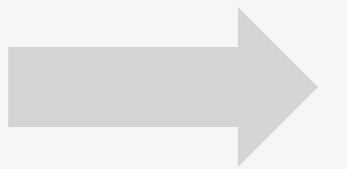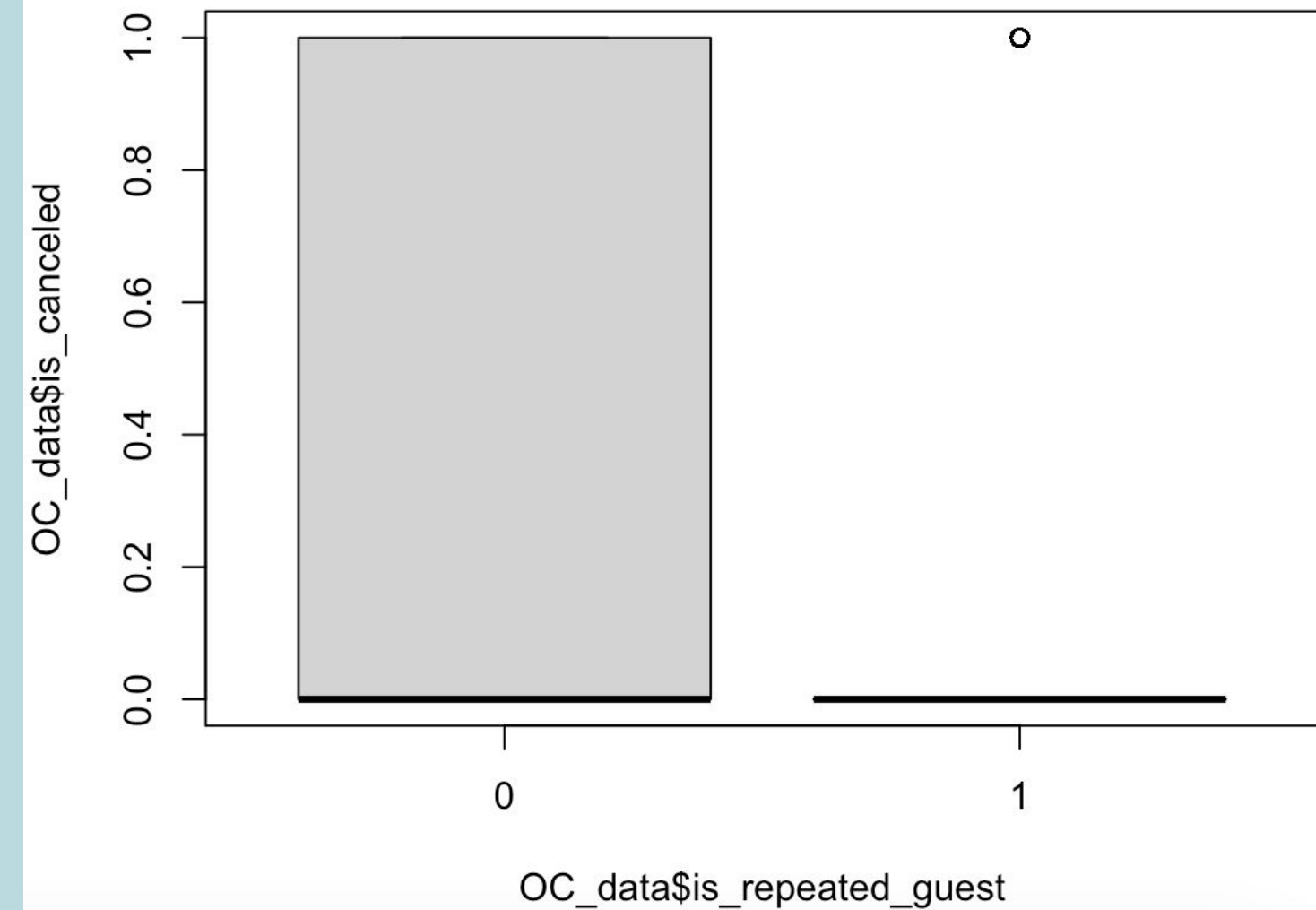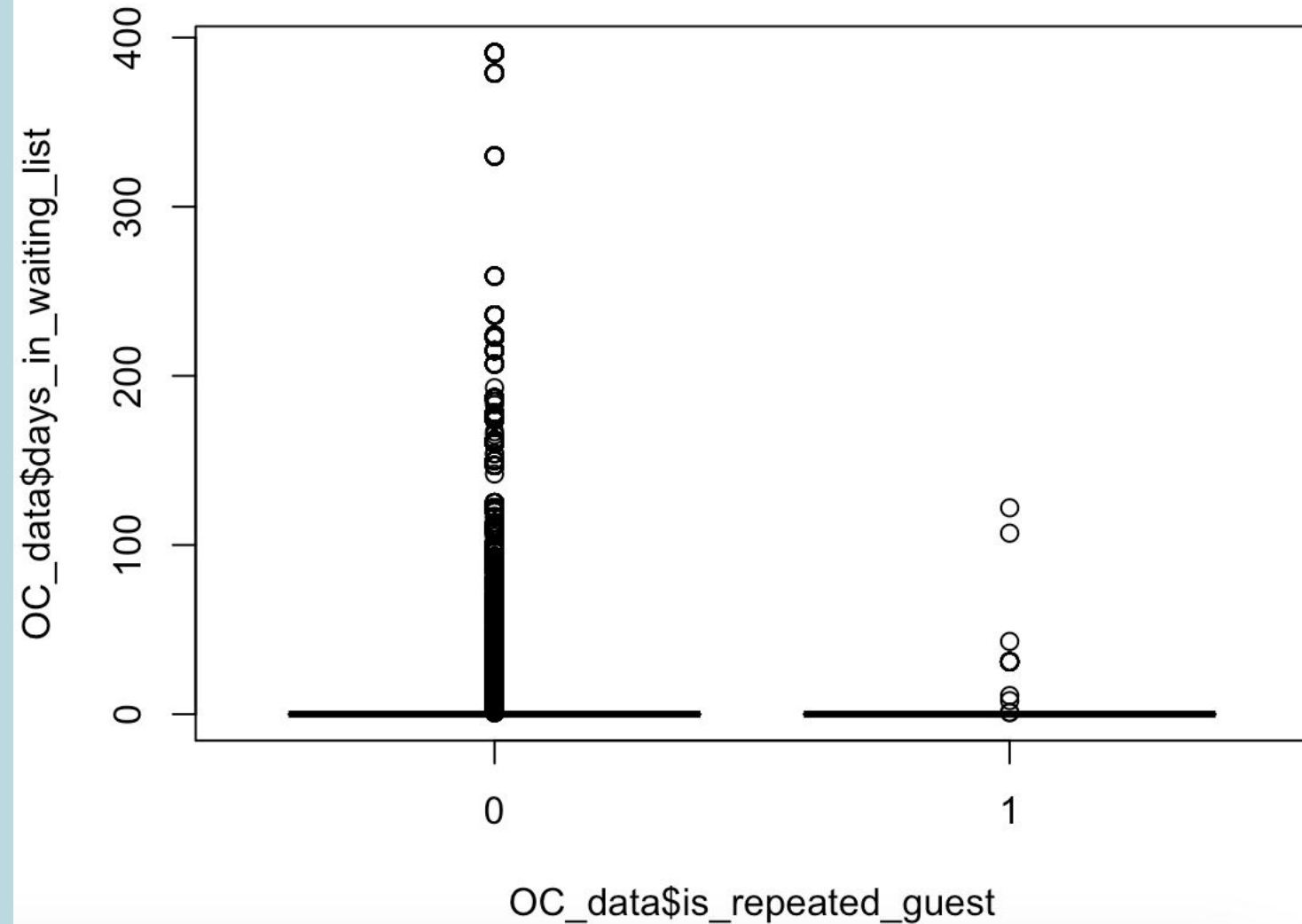
1. Cancelation Fees
42,000 Cancellations

Fee of $50: $700,000 a year

Fee of $100: $1.4m a year

Fee of $150: $2.1m a year

2. Loyalty Program

- A repeated guest is less likely to cancel their reservation and spend less time on the waiting list
- A loyalty program member would not have to put down a deposit and the cancelation fee is waved
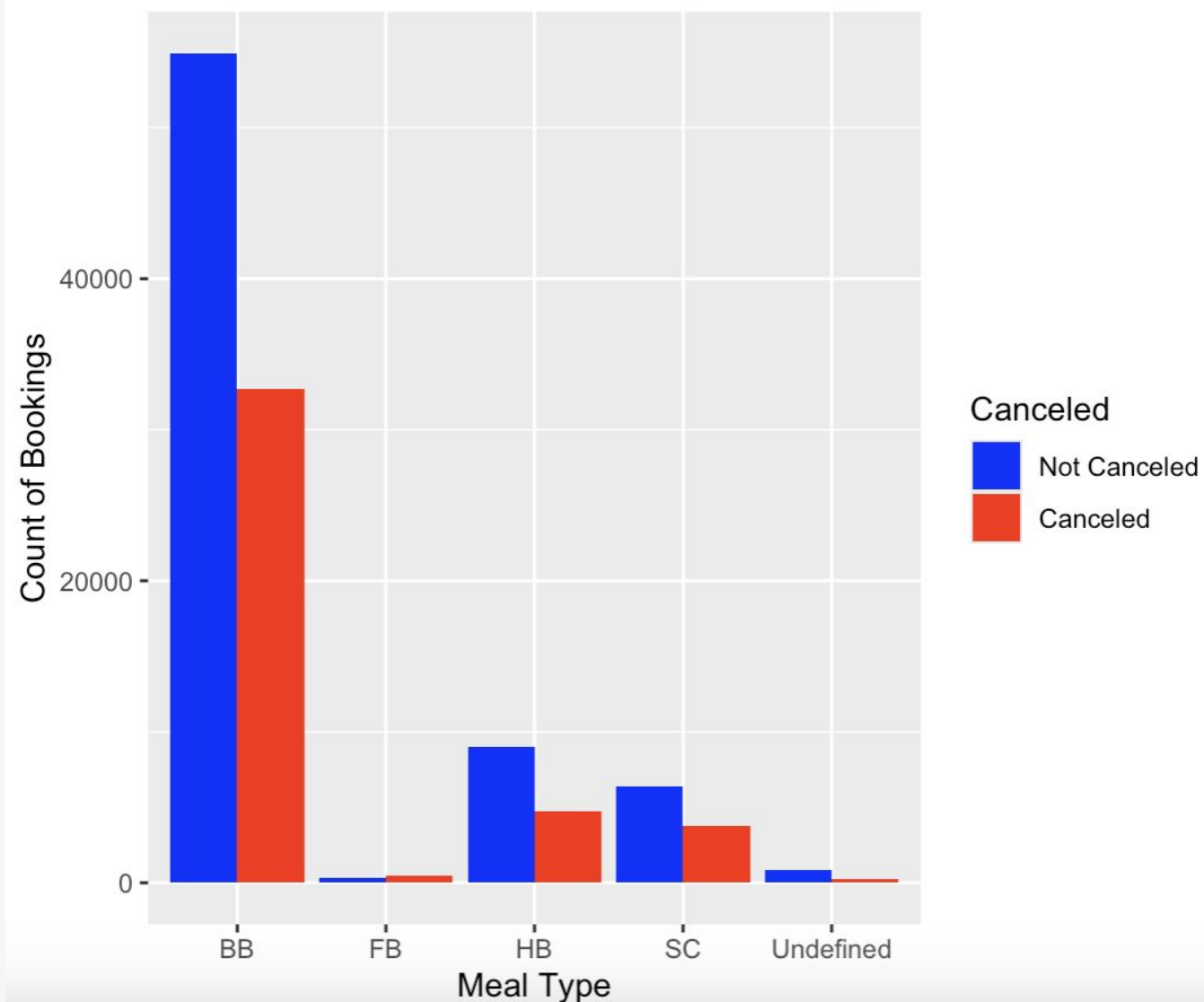
3. Discounts Tied with Non-Refundable Deposits

model_rf$finalModel

lead_time   o
adr
arrival_date_week_number
special_requests1

Comparison of Cancellations by Meal Type

If a guest chooses to opt in to a non-refundable deposit, the hotel will offer:
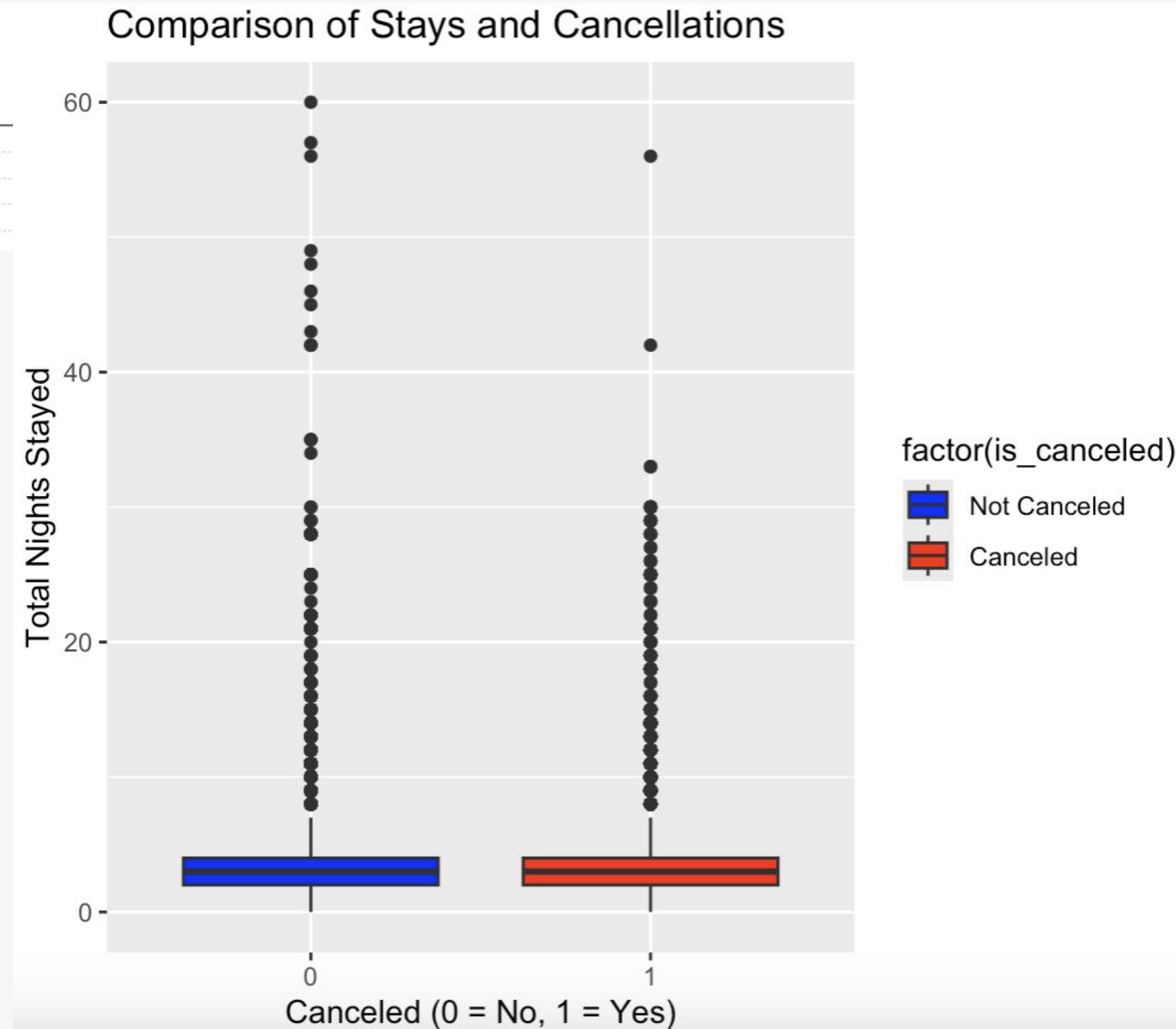- Included Bed & Breakfast
- Free Parking

Canceled
- Not Canceled
- Canceled

Count of Bookings

40000

20000

0

BB   FB   HB   SC   Undefined
Meal Type

Required Parking Spaces

8

6

4

2

0

3. Discounts Tied with Non-Refundable Deposits

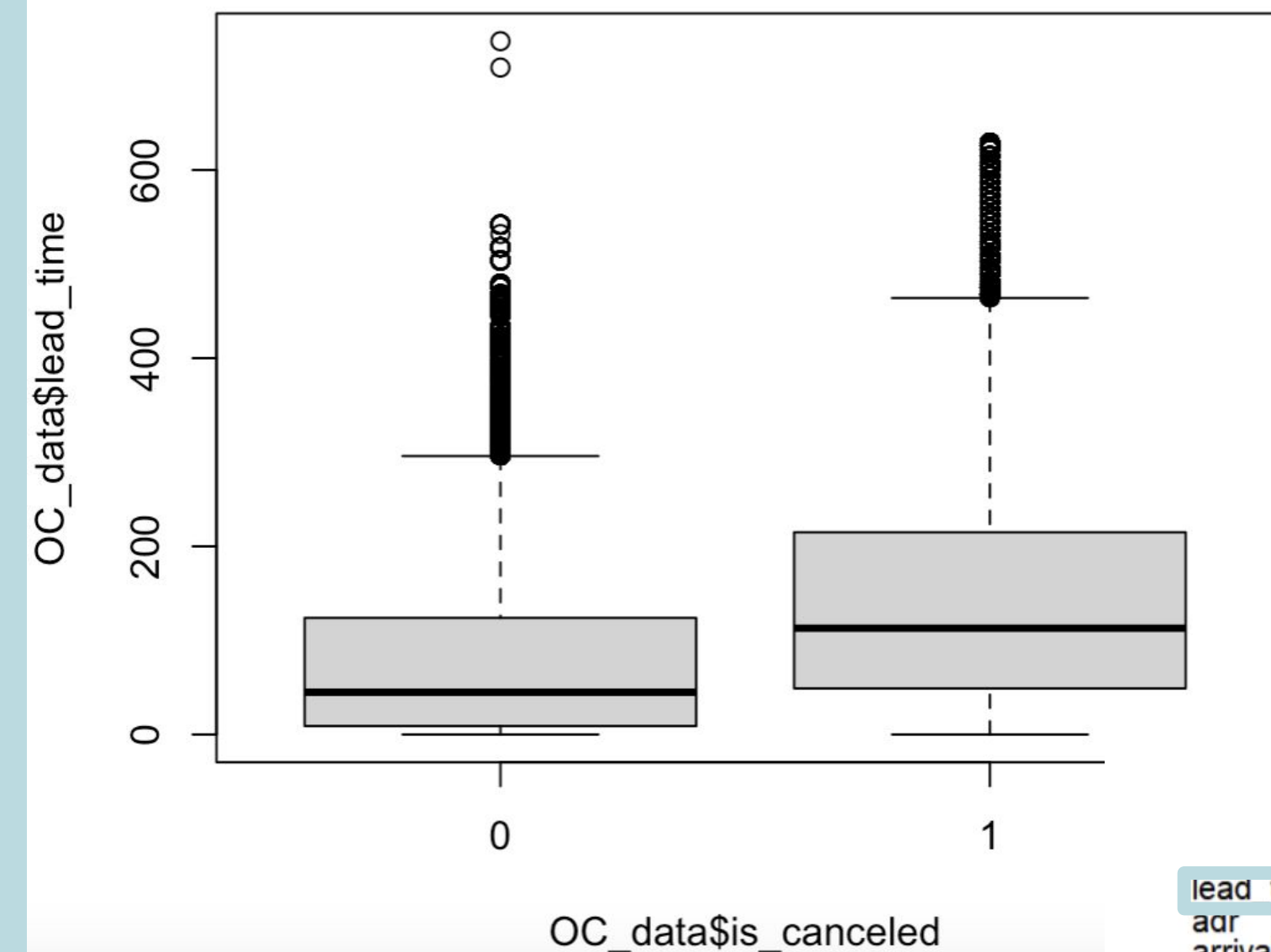**model_rf$finalModel**

lead_time
adr
arrival_date_week_number
special_requests1
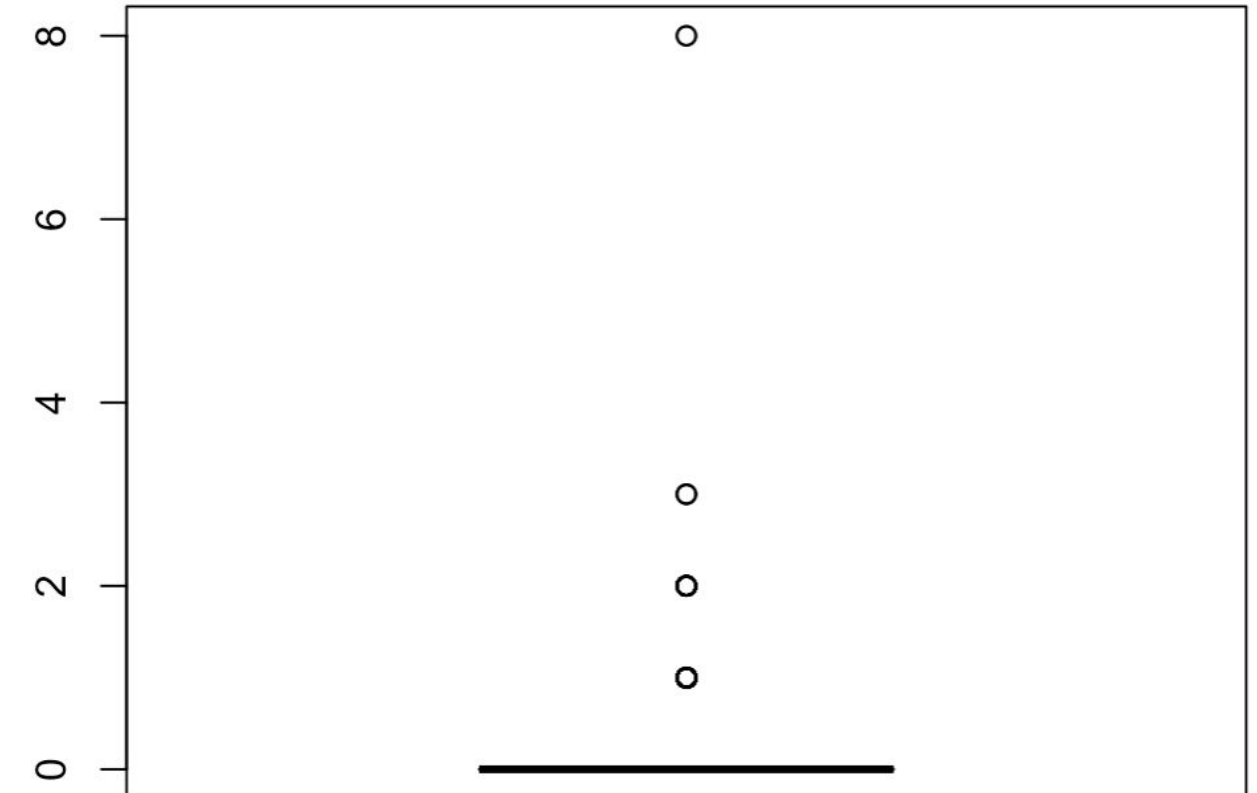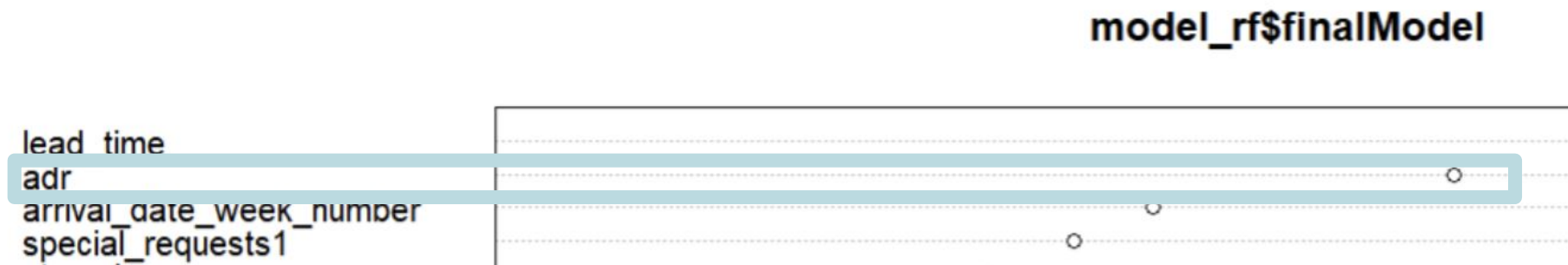
Long-Stay Discount: If a customer stays over 15 days, they're offered a 10% discount for the remainder of their stay.

Comparison of Stays and Cancellations

Total Nights Stayed

60

40

20

0

Canceled (0 = No, 1 = Yes)
0   1

factor(is_canceled)

Not Canceled

Canceled

# 4. Last Minute Sales for Online Bookings

```
                                    coef(OC_model$finalModel)
(Intercept)                                  -285.790062304
hotelResort.Hotel                               0.060079574
lead_time                                       0.396169433
```

### Cancellations by Distribution Channel



The longer the lead time, the more likely a customer is to cancel.

In order to cut lead time, we would offer last minute deals.

An example of a last minute deal would be "Book in the next month and receive $400 towards your stay"
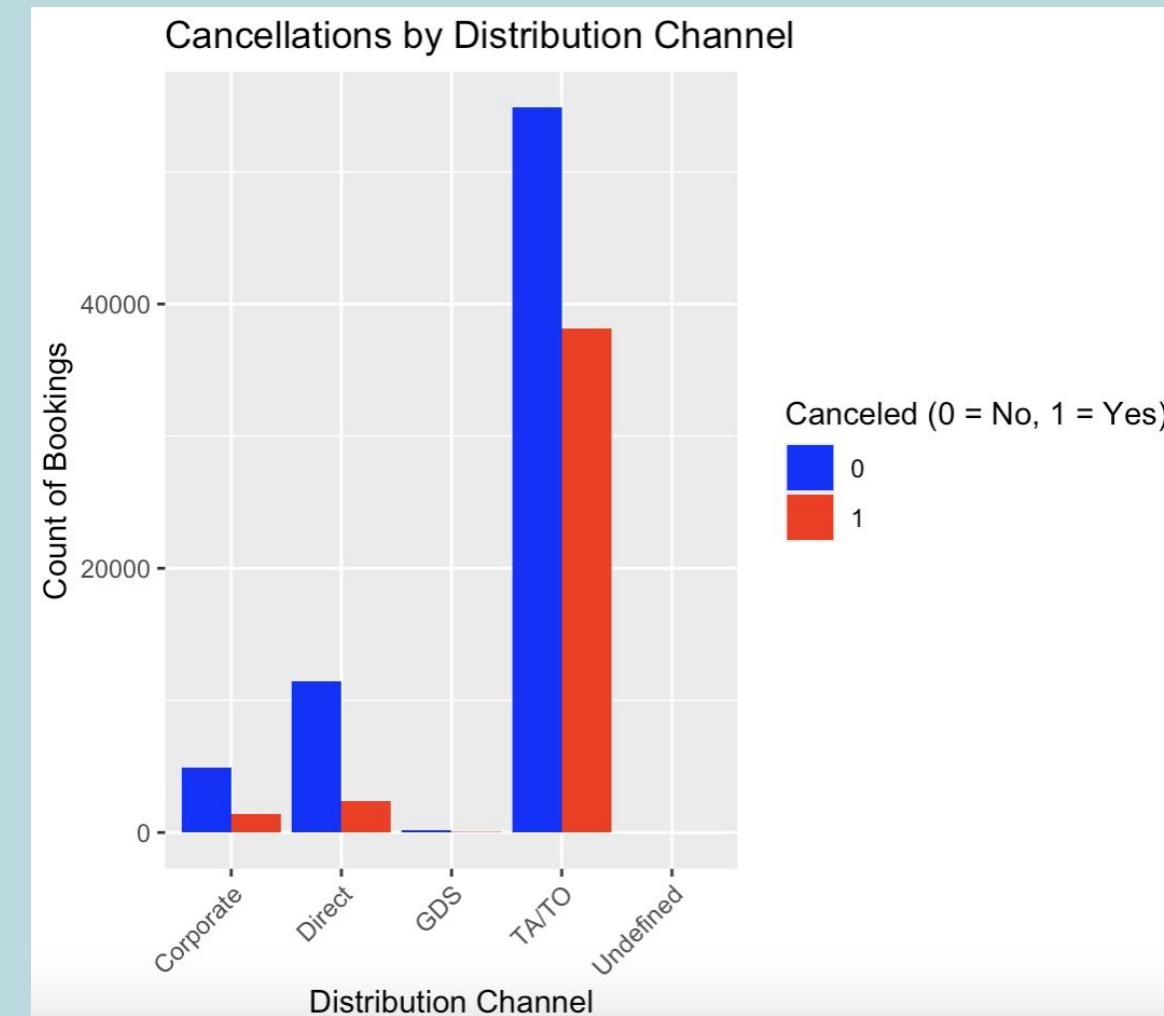


**model_rf$finalModel**

```
lead_time
adr
arrival_date_week_number
special_requests1
```

5. Special Request Deposit

model_rf$finalModel

lead_time	○
adr	○
arrival_date_week_number	○
special_requests1	○
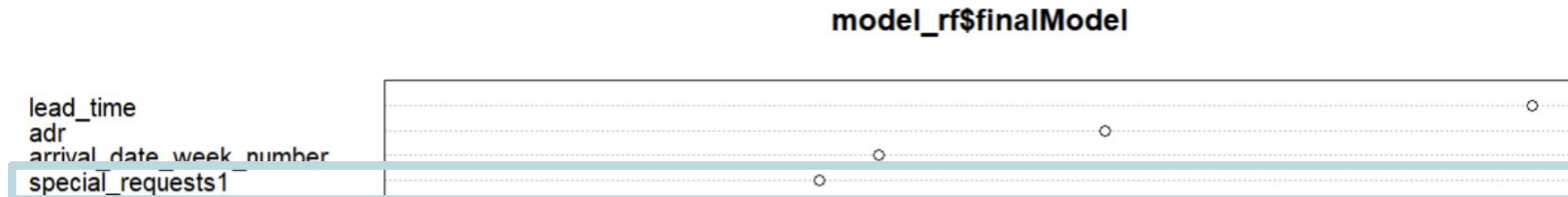
Special request take time and resources for the hotel. We recommend a $50 deposit per request that is 100% refundable if the customer does not cancel.

Proportion of Cancellations by Number of Special Requests
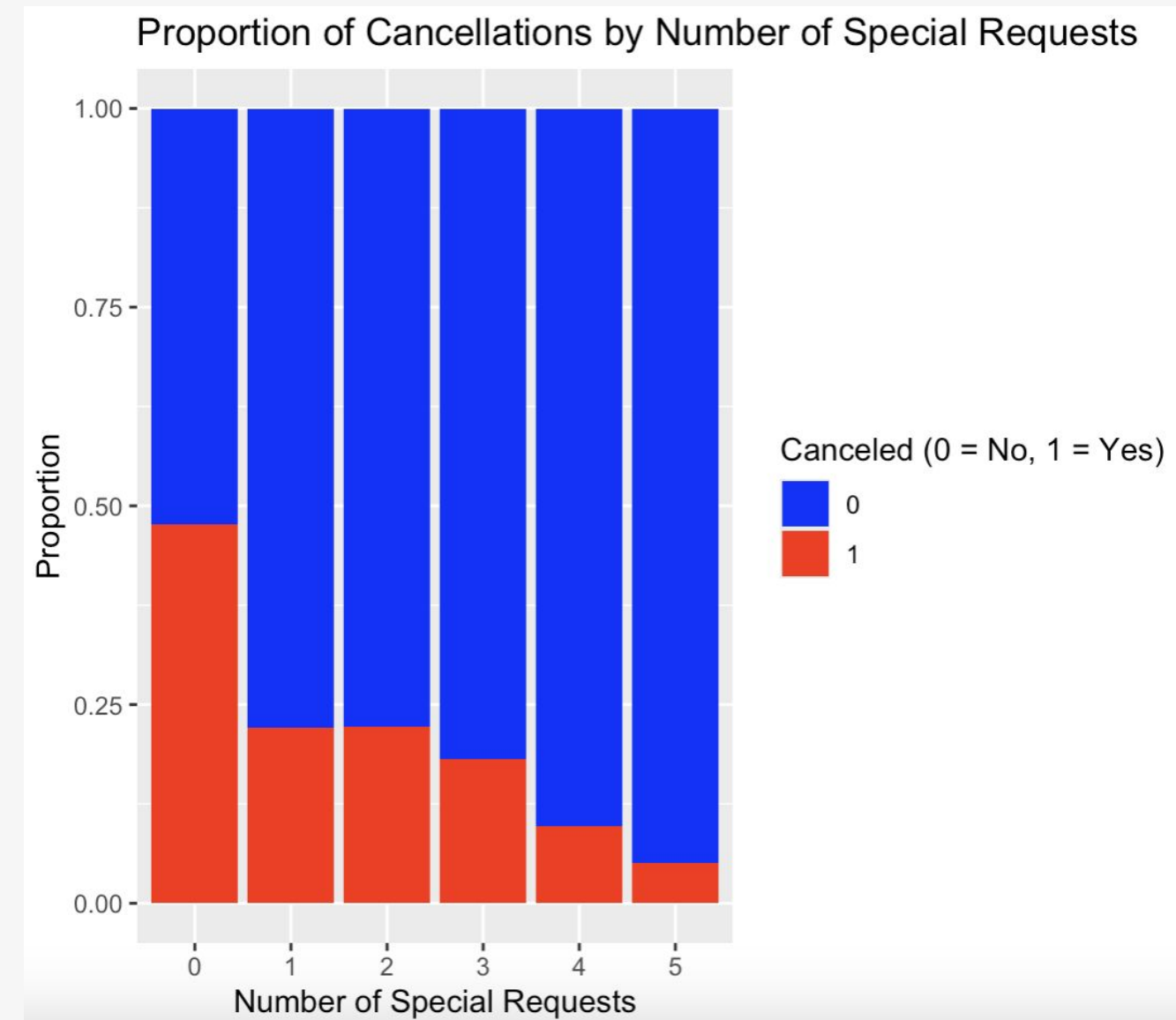
Models

There were many but there was one walked the walk better than the rest...

Random Forest Model

01 **Key Steps Taken**
- Data Preparation
- Hyperparameter Tuning
- Parallel Processing

02 **Model Performance**
- ROC Curve & AUC (.84)
- Variable Importance

03 **Outcomes**
- Feature Insights
- Improved Customer Retention

Inner workings

Imbalance with SMOTE

39% cancellation rate, skewed distribution causing bias.

MTRY

mtry = 9, with 9 var mode the model captures intricate patterns without overfitting to the noise in the data.

K-Fold Cross-Validation

4 train to 1 validation

Questions