Binary Classification with a Tabular Reservation Cancellation Dataset

Авторы:

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Description of the data and the task

```
 #   Column                                Non-Null Count  Dtype
---  ------                                --------------  -----
 0   id                                    42100 non-null  int64
 1   no_of_adults                          42100 non-null  int64
 2   no_of_children                        42100 non-null  int64
 3   no_of_weekend_nights                  42100 non-null  int64
 4   no_of_week_nights                     42100 non-null  int64
 5   type_of_meal_plan                     42100 non-null  int64
 6   required_car_parking_space            42100 non-null  int64
 7   room_type_reserved                    42100 non-null  int64
 8   lead_time                             42100 non-null  int64
 9   arrival_year                          42100 non-null  int64
 10  arrival_month                         42100 non-null  int64
 11  arrival_date                          42100 non-null  int64
 12  market_segment_type                   42100 non-null  int64
 13  repeated_guest                        42100 non-null  int64
 14  no_of_previous_cancellations          42100 non-null  int64
 15  no_of_previous_bookings_not_canceled  42100 non-null  int64
 16  avg_price_per_room                    42100 non-null  float64
 17  no_of_special_requests                42100 non-null  int64
 18  booking_status                        42100 non-null  int64
dtypes: float64(1), int64(18)
memory usage: 6.1 MB
```

- The dataset for this competition (both train and test) was generated from a deep learning model trained on the **Reservation Cancellation Dataset**
- It is necessary to predict the target variable - whether the reservation was canceled

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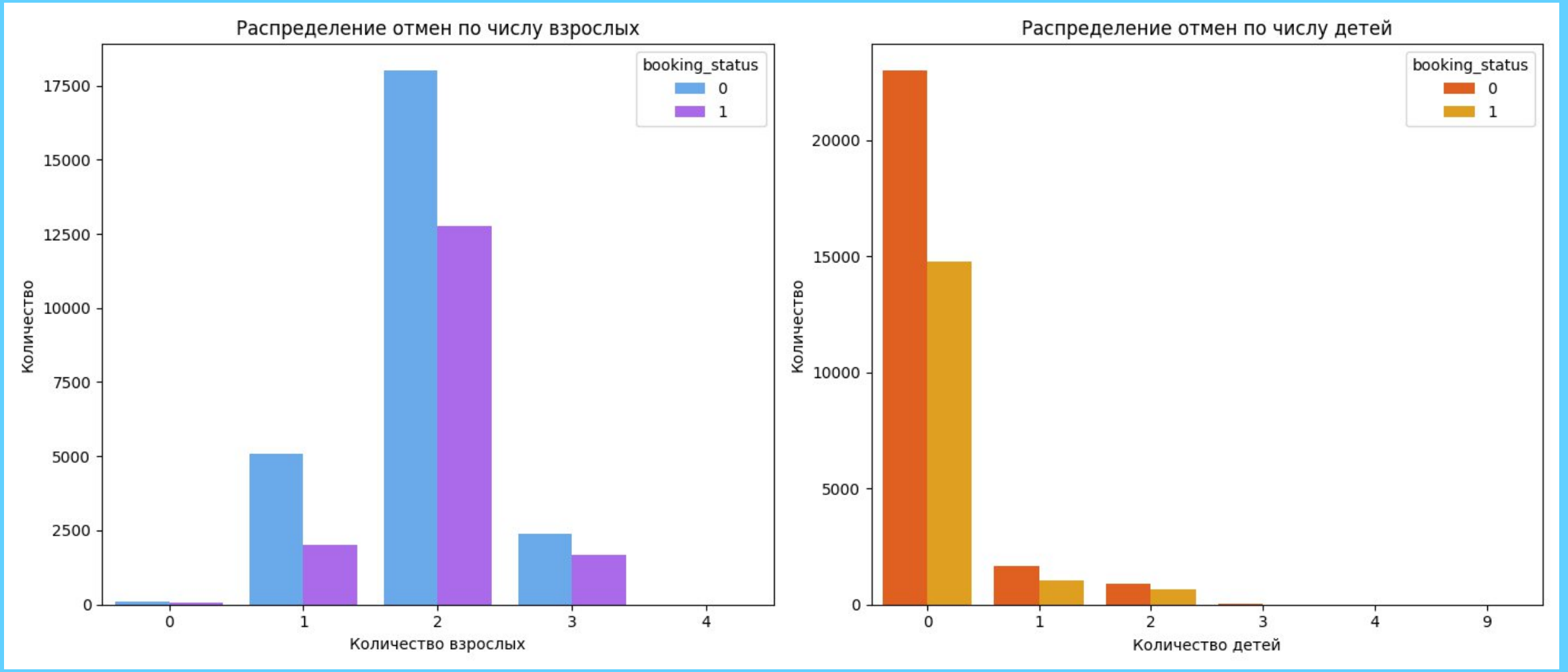
Data visualization



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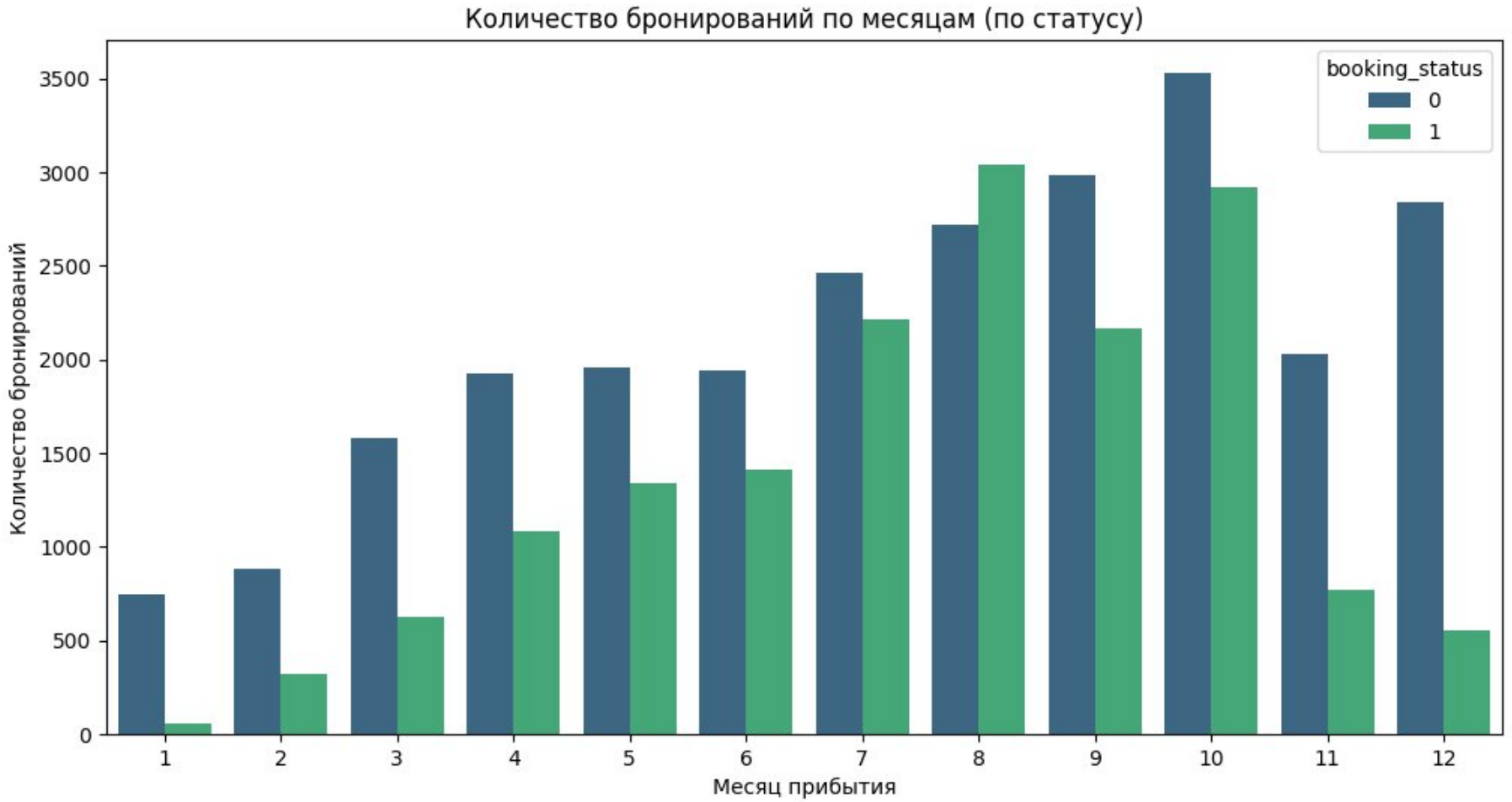
Data visualization



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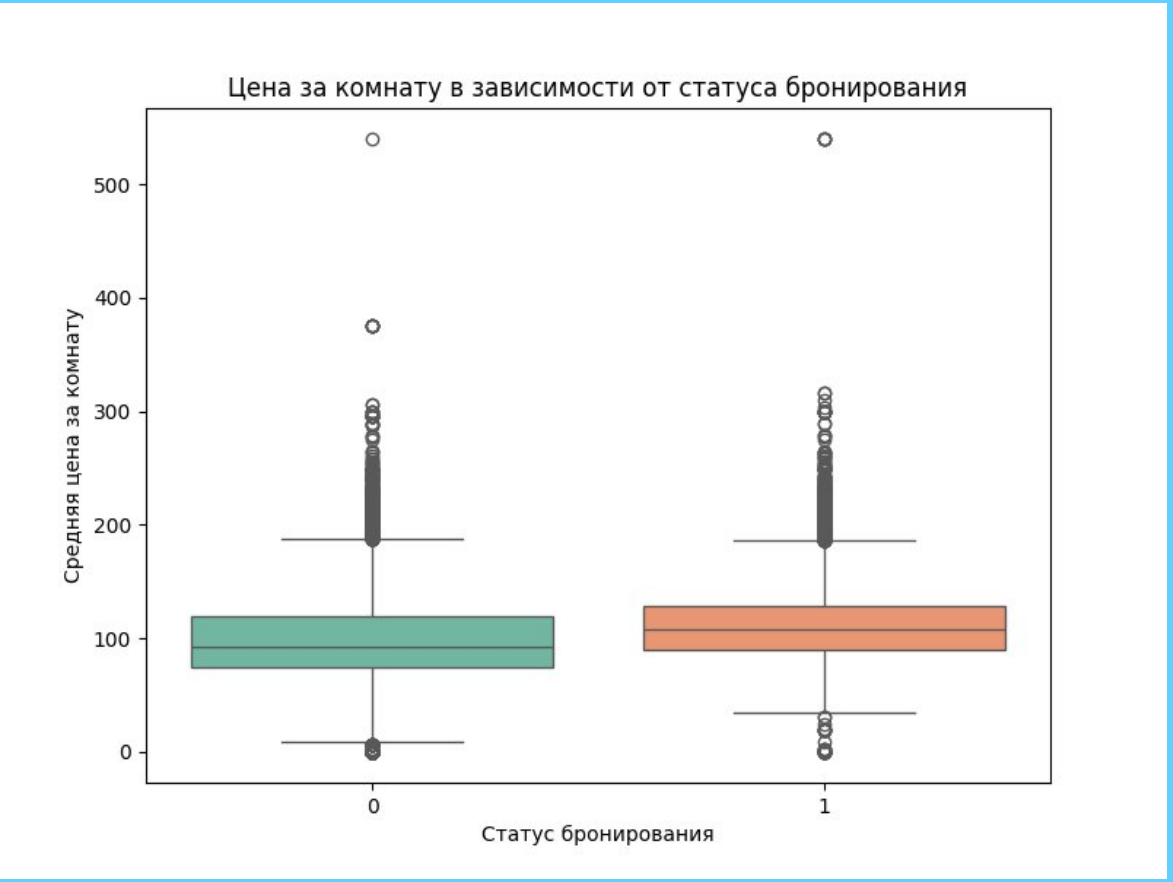
Data visualization



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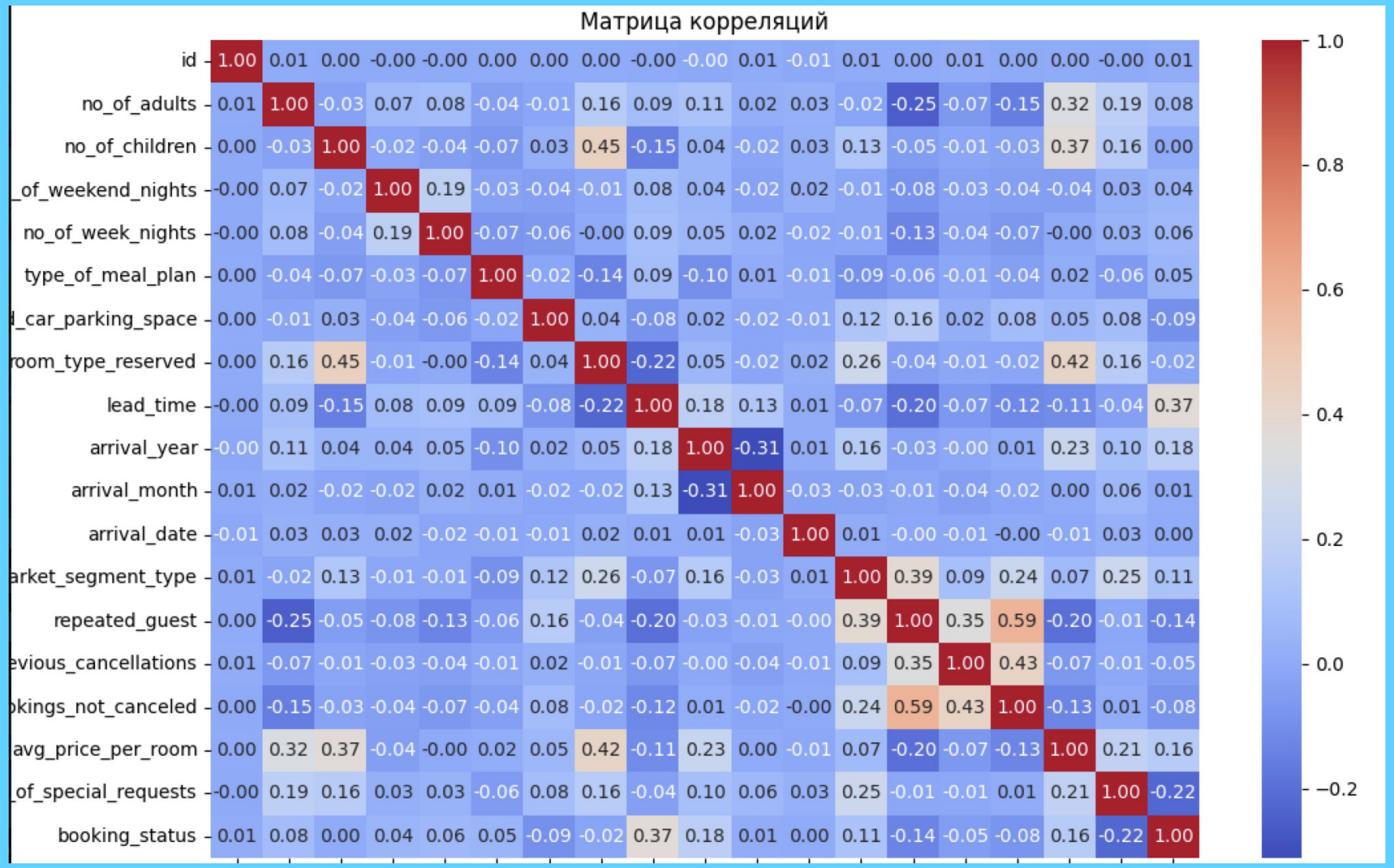
Data visualization



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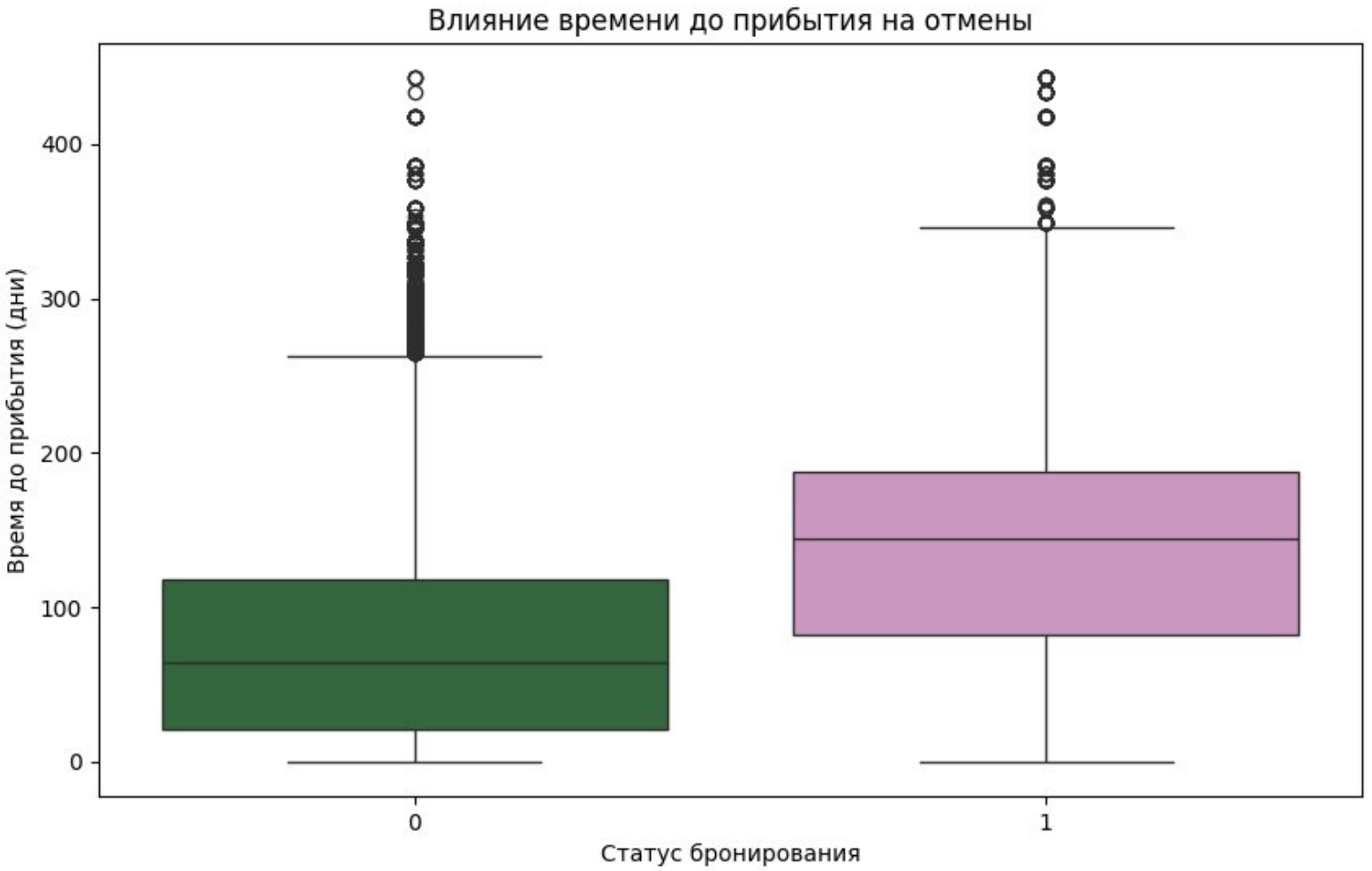
Data visualization



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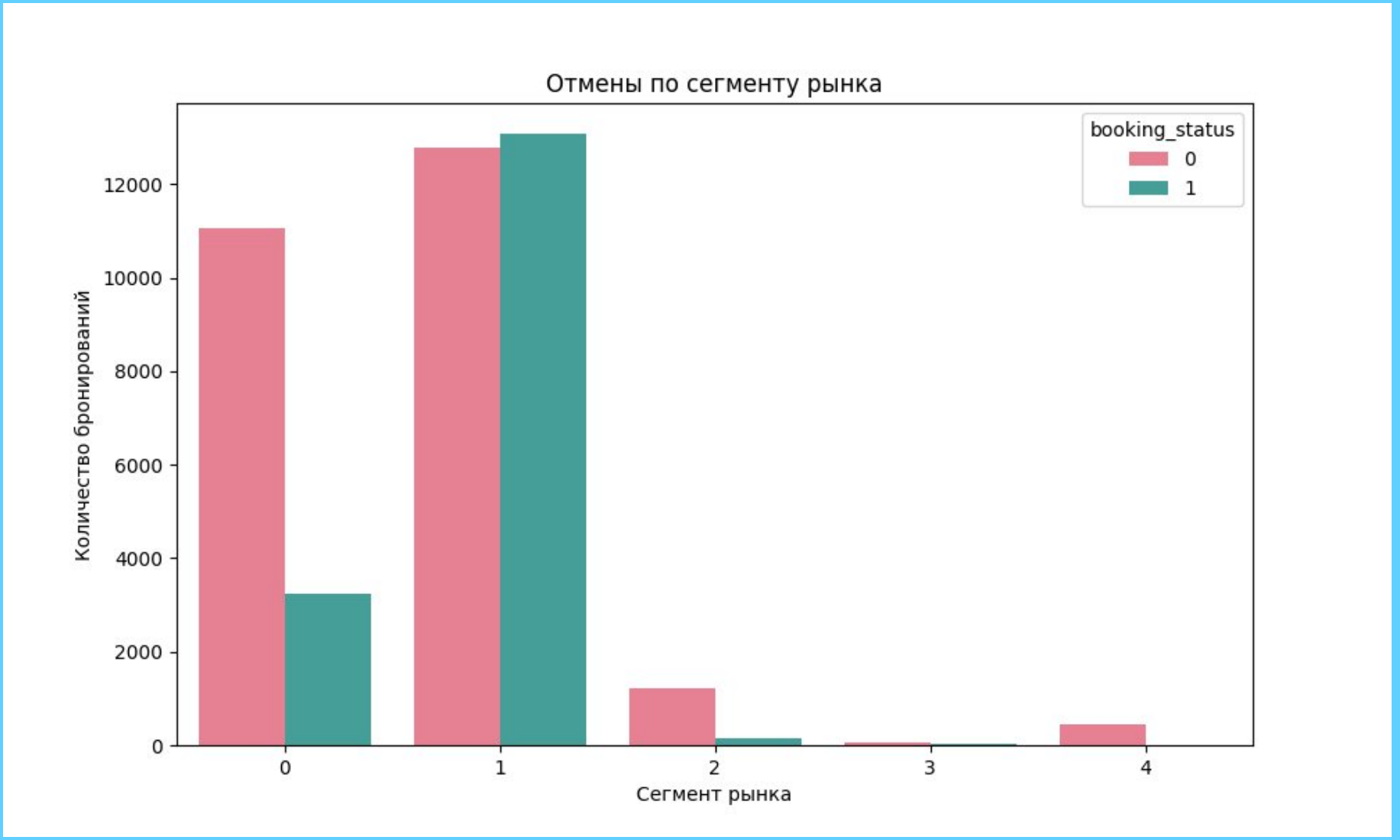
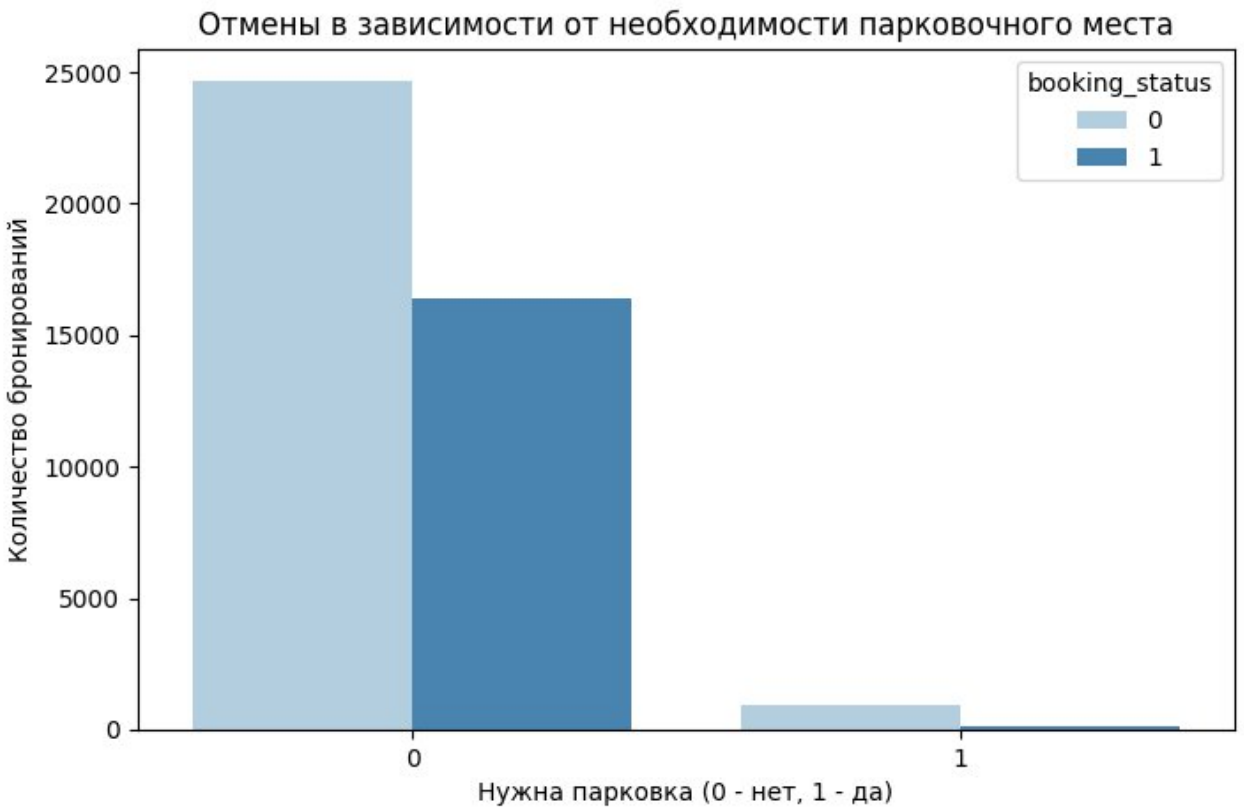
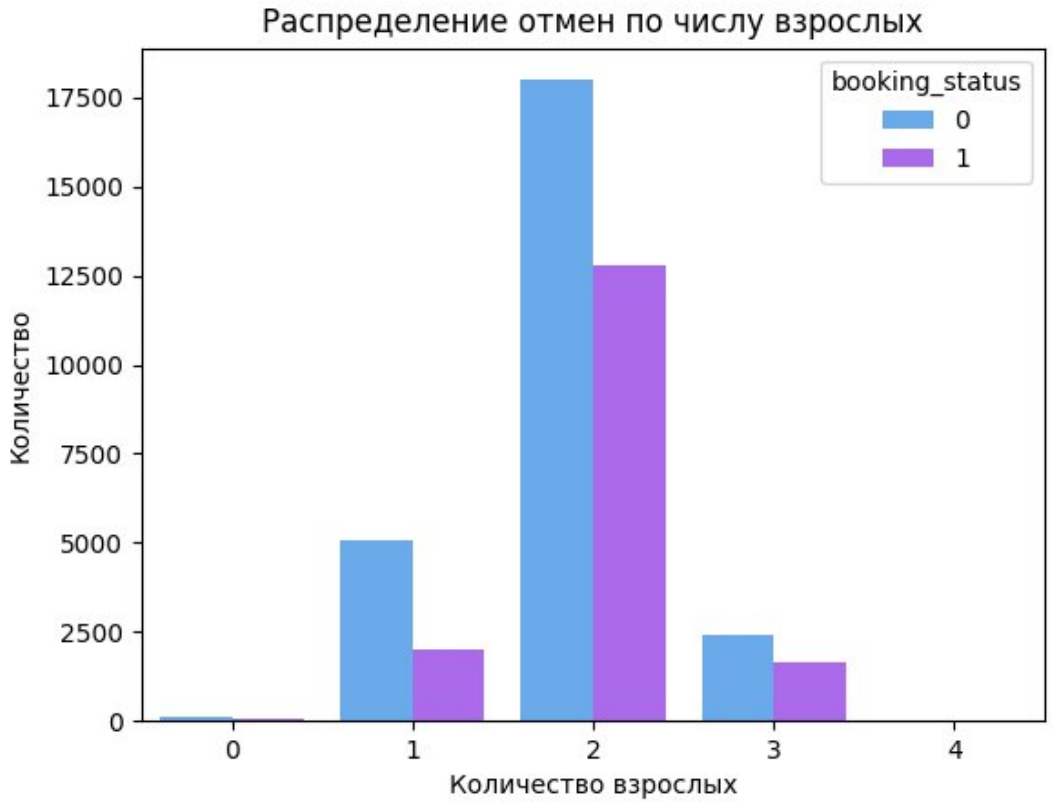
Data visualization



Data visualization





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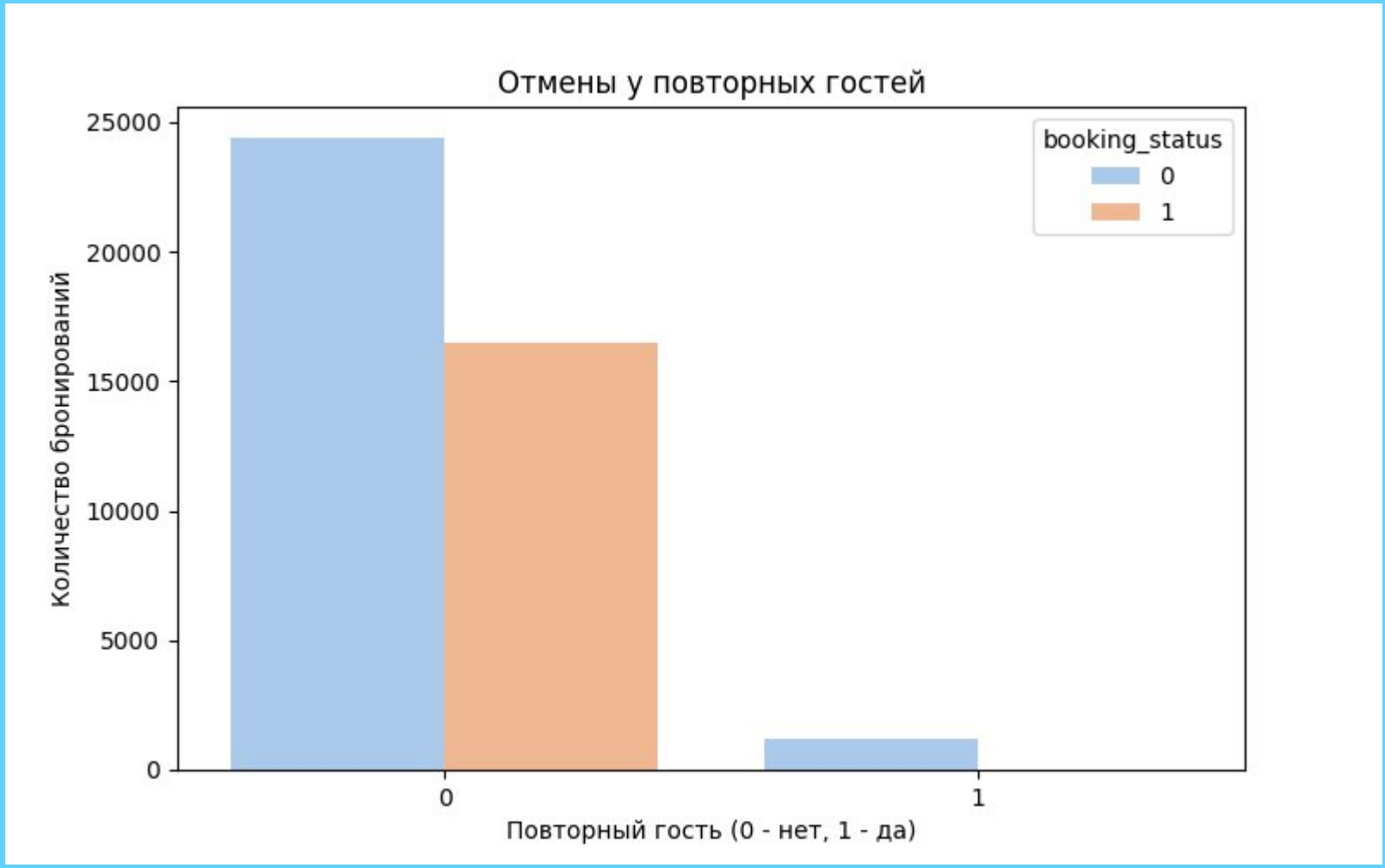
Data visualization



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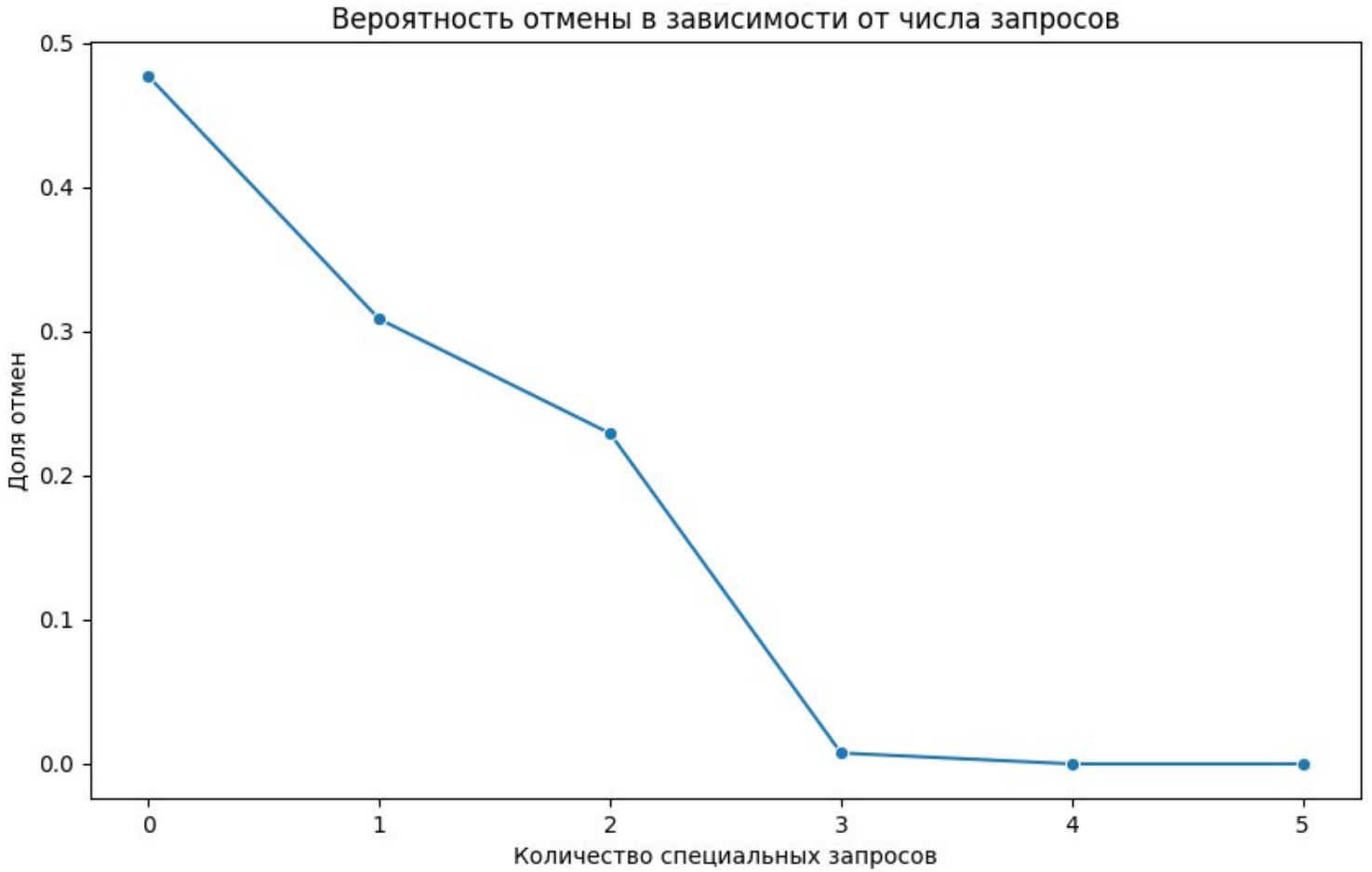
Data visualization



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Data preparation and Train

- Adding polynomial features
- Detecting outliers
- Detection of categorical features

1. **LightGBM (LGBMClassifier):**
- Gradient boosting on root trees, optimized for speed and performance.
2. **XGBoost (XGBClassifier):**
- Another popular implementation of gradient boosting, known for its efficiency and accuracy in classification and regression tasks.
3. **CatBoost (CatBoostClassifier):**
- A specialized library for working with categorical invitations; gradient boosting is used.

Stacking/Blending. Meta-training that uses the results of the predictions of three models to improve the final predictive ability. This is achieved by optimizing the weights of the models using the Nelder-Mead method to maximize the ROC AUC estimate.
Use early_stopping_rounds

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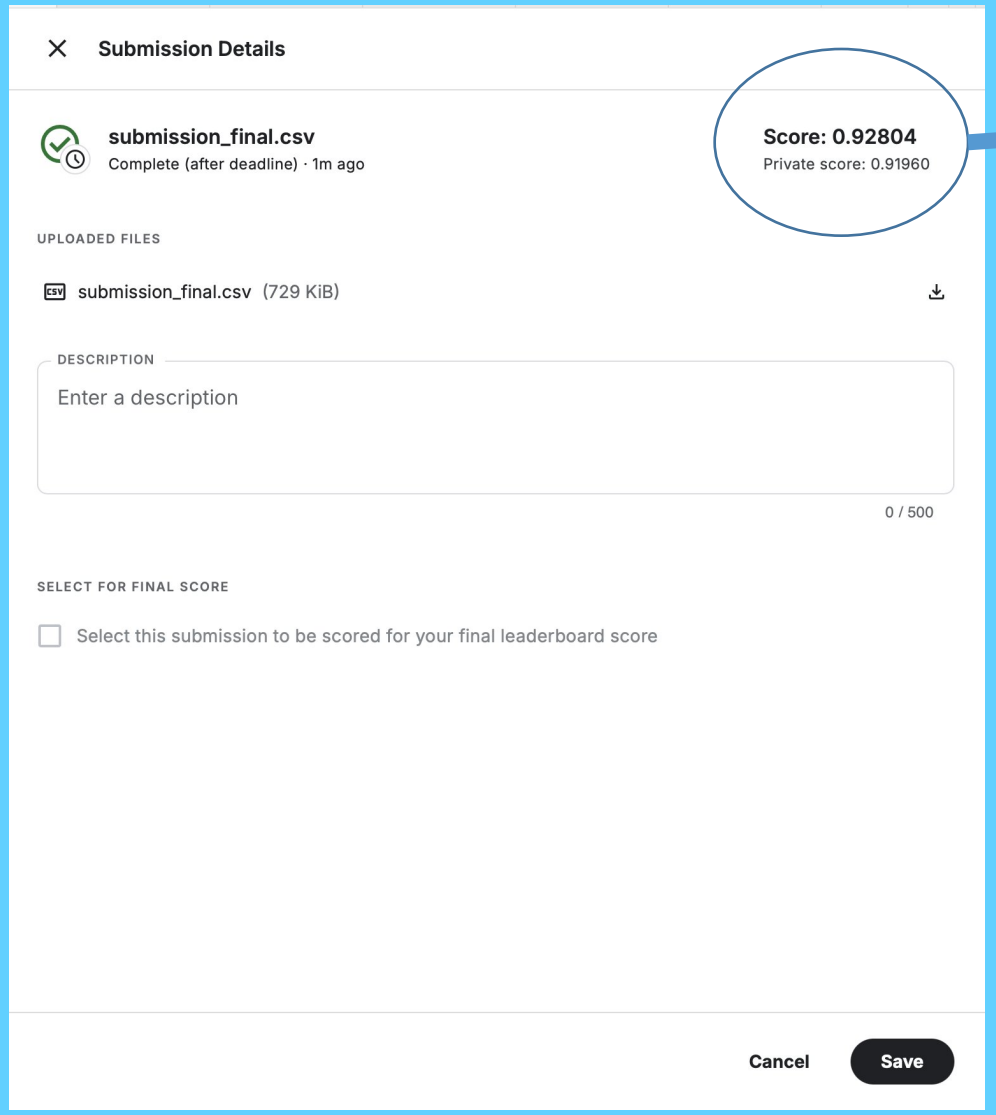
Result



Private Score	Public Score
0.91960	0.92804

75 private perc	85 private perc	95 private perc
0,9036	0,91136	0,91795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