



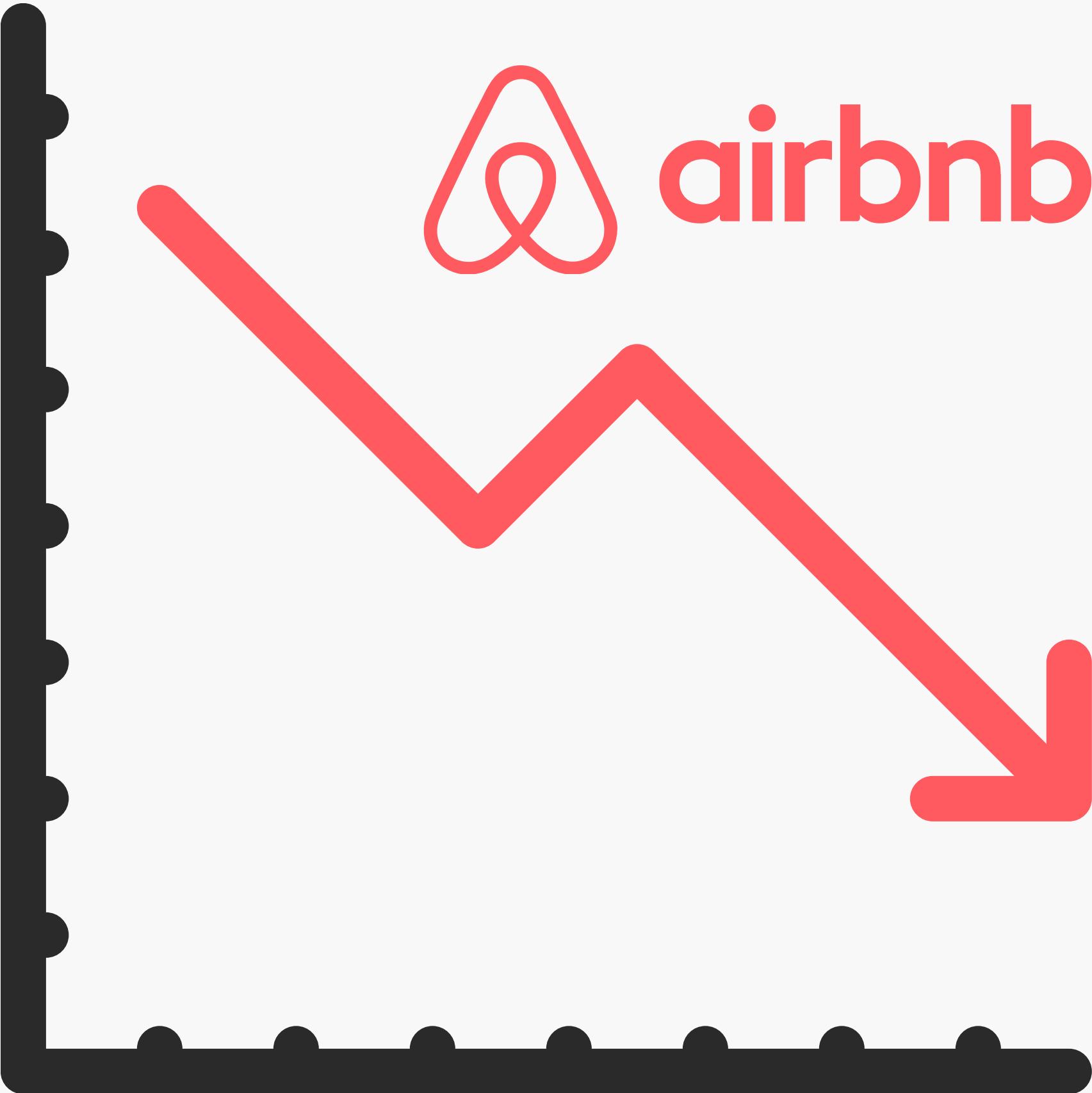
APRIL 10, 2021

The Price is Right: Airbnb Pricing Recommendation

Predicting the Optimal Price of Listings in the
Philippines Using a Machine Learning Model

Edward, Jona, Rara, Tyron

Airbnb | 2021



Drops by
70% in
bookings



**Identify the factors
affecting the price of
Airbnb properties**



**Train a Machine Learning
Model that will
recommend an optimal
property price**

Proposed Solution



About the data

Number of Philippines Airbnb Properties: **12,336**

Airbnb Features

- Title
- Location
- Capacity
- Information
- Property Type
- Price
- Amenities
- Description Badges
- Reviews
- Ratings

Proximity Analysis

- calculate the distance between the Airbnb listing and other spatial features

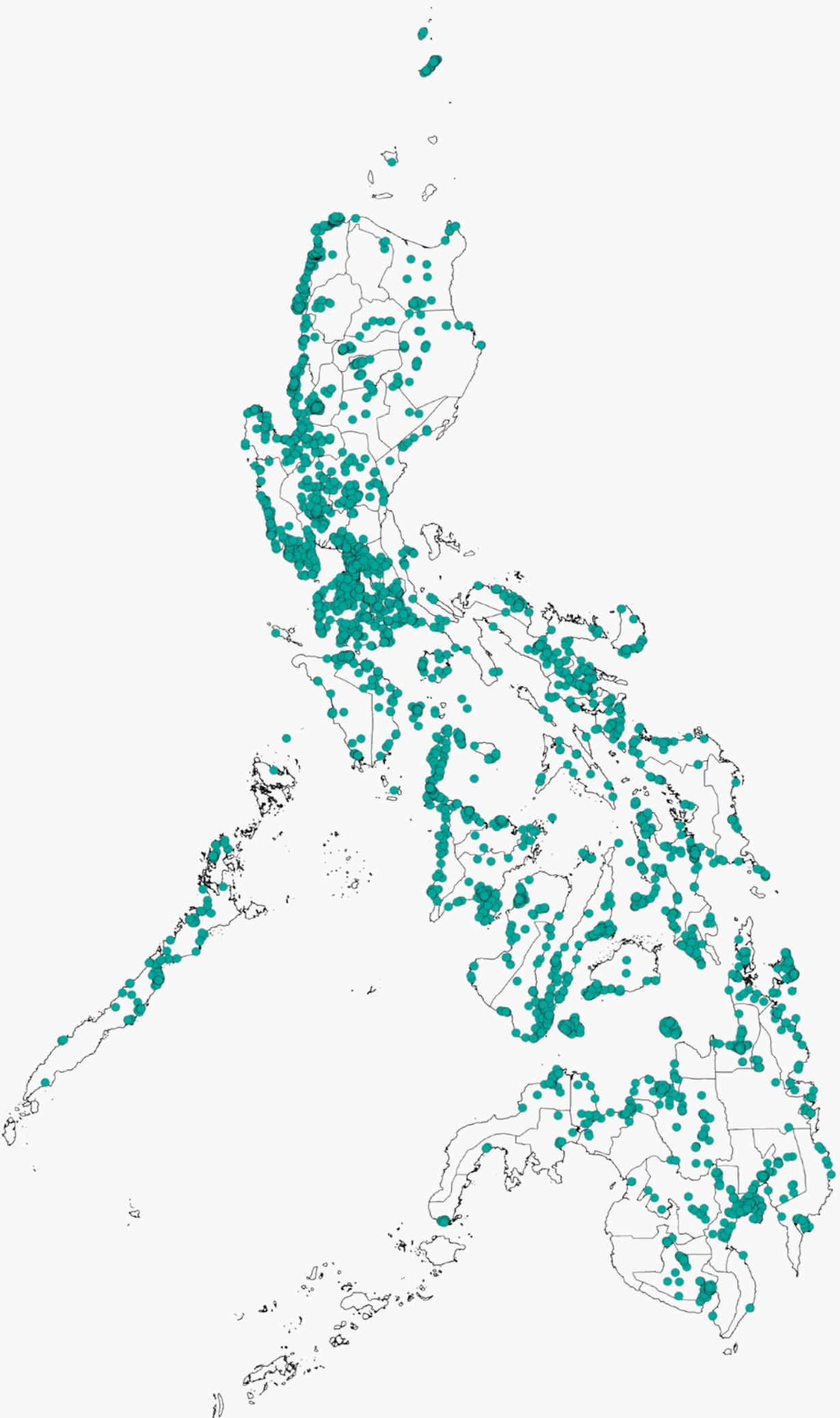
Data was **acquired** on **March 26, 2021**. This model is a prototype for this specific timestamp in order to take into account the price variability with respect to time.

11,409

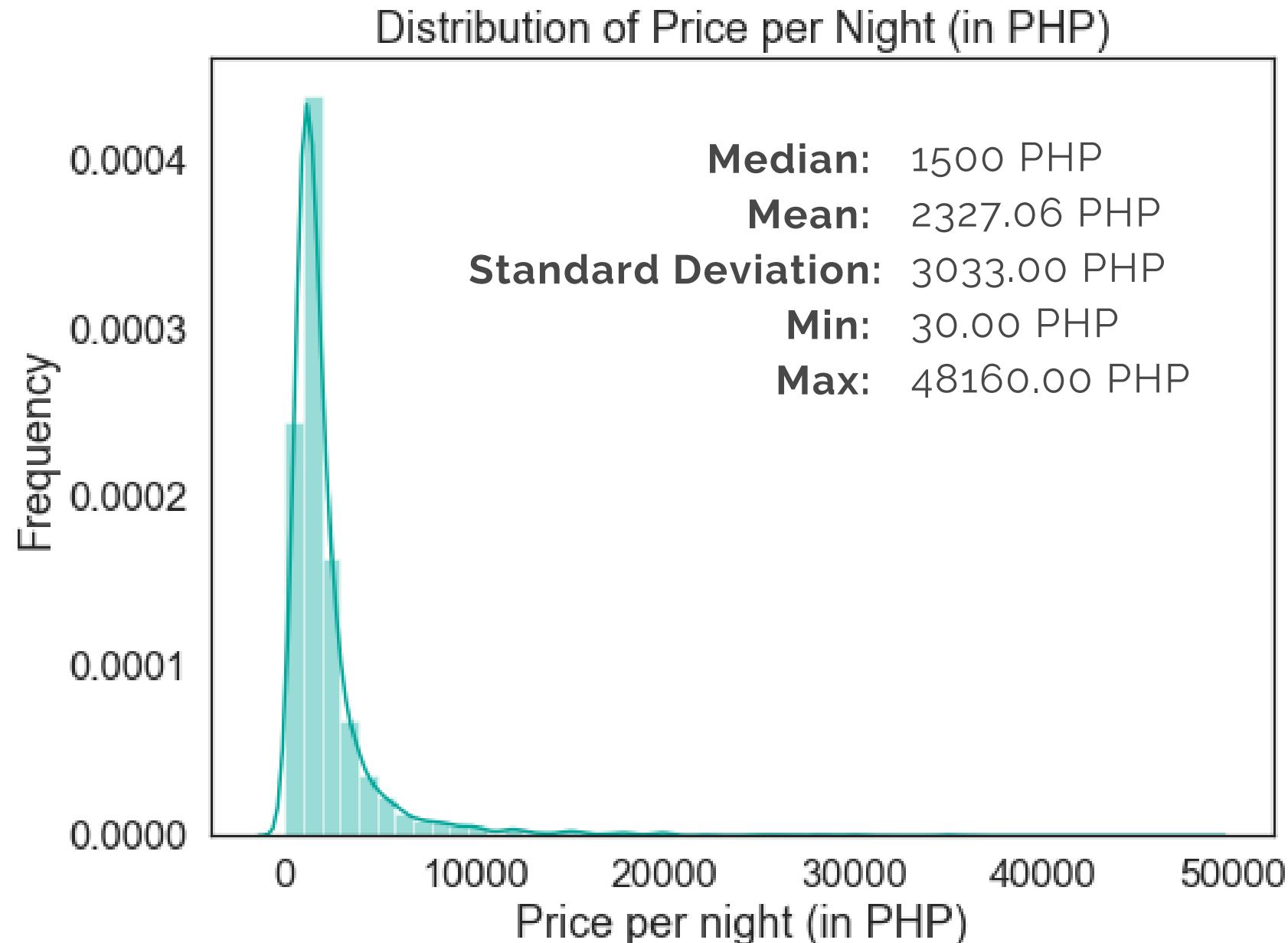
Airbnb properties in the Philippines

Provinces without Airbnb Properties:

- Basilan
- Sulu
- Tawi-tawi



Distribution of Airbnb Prices



Cabangan, Central Luzon, Philippines



⋮ Show all photos

Private room in bed and breakfast hosted by Joylen

16 guests · 6 bedrooms · 9 beds · 8 shared baths

₱48,160 / night

Guiuan, Eastern Visayas, Philippines

- Free Electricity
 - Php 850 per month
- “is our business”*



⋮ Show all photos

Shared room in house hosted by

8 guests · 1 bedroom · 4 beds · 6 shared baths

₱30 / night

✓ Most expensive property is an **entire villa**

✓ Cheapest type of property are **shared rooms**

Strategy

Data Cleaning

- Check for null, duplicates, and outliers
- Scrapped Data: 12,336
- Final Data: 11,409

Proximity Analysis

- distance from:
 - airport, coastal, malls, supermarkets, restaurants, highways, tourist spots, transportation terminals, airbnb properties

Exploratory Data Analysis

- Explore prices
- Explore type of Airbnbs

Data Pre-Processing

- Label and one-hot encoding
- Standardization
- Variance Inflation Factor

Modeling and Evaluation

- Use different models
- Comparison of evaluation metrics (RMSE, R2)

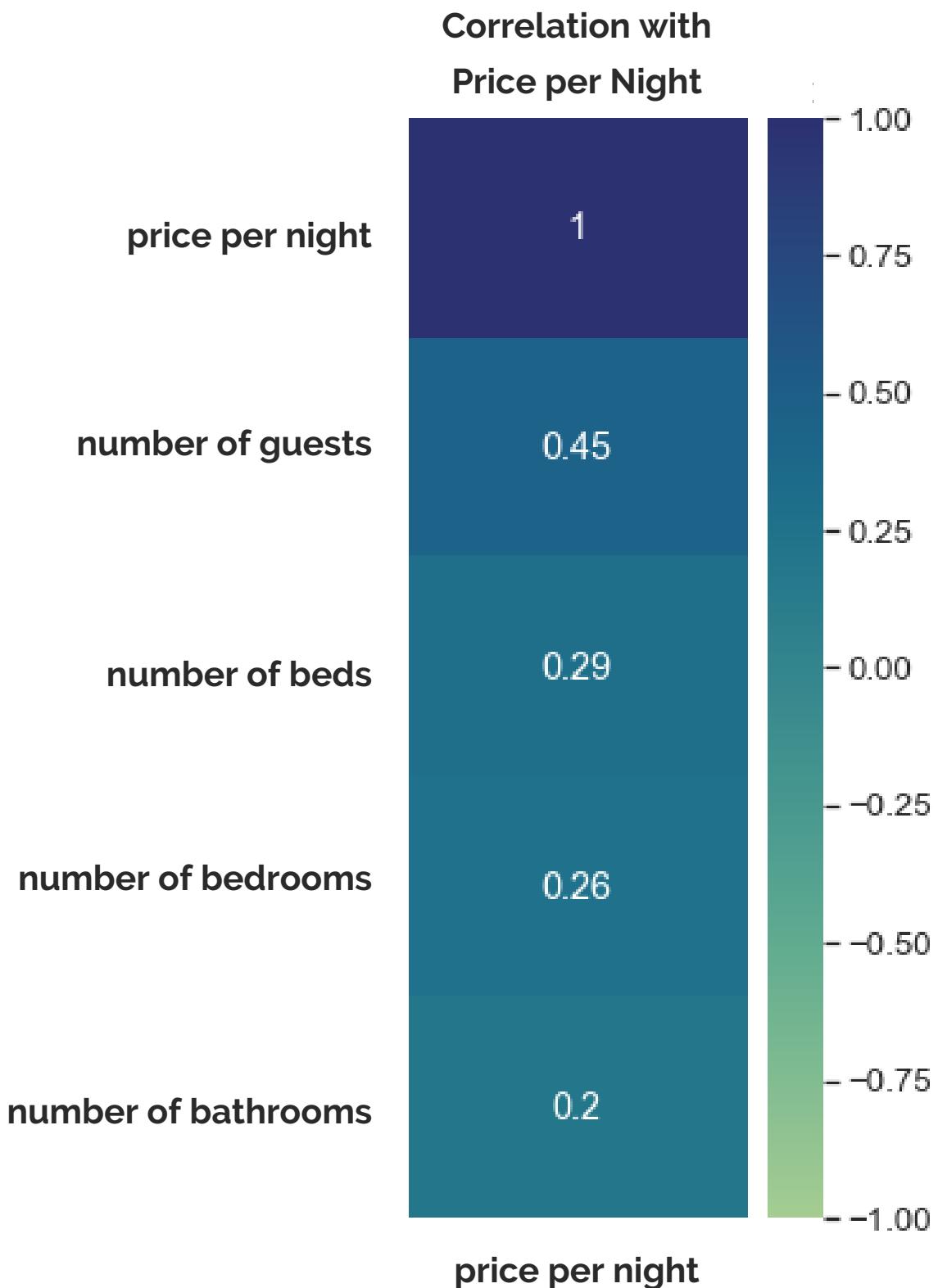
Machine Learning Models

<i>Model</i>	<i>XGBoost Regressor</i>	<i>CAT Boost Regressor</i>	<i>Random Forest Regressor</i>	<i>Linear Regression</i>	<i>Ridge Regression</i>	<i>Lasso Regression</i>	<i>Elastic Net Regression</i>
R ²	0.65	0.56	0.59	0.45	0.45	0.46	0.45
RMSE	1804.55	1951.03	1945.56	2250.20	2250.20	2249.88	2250.09

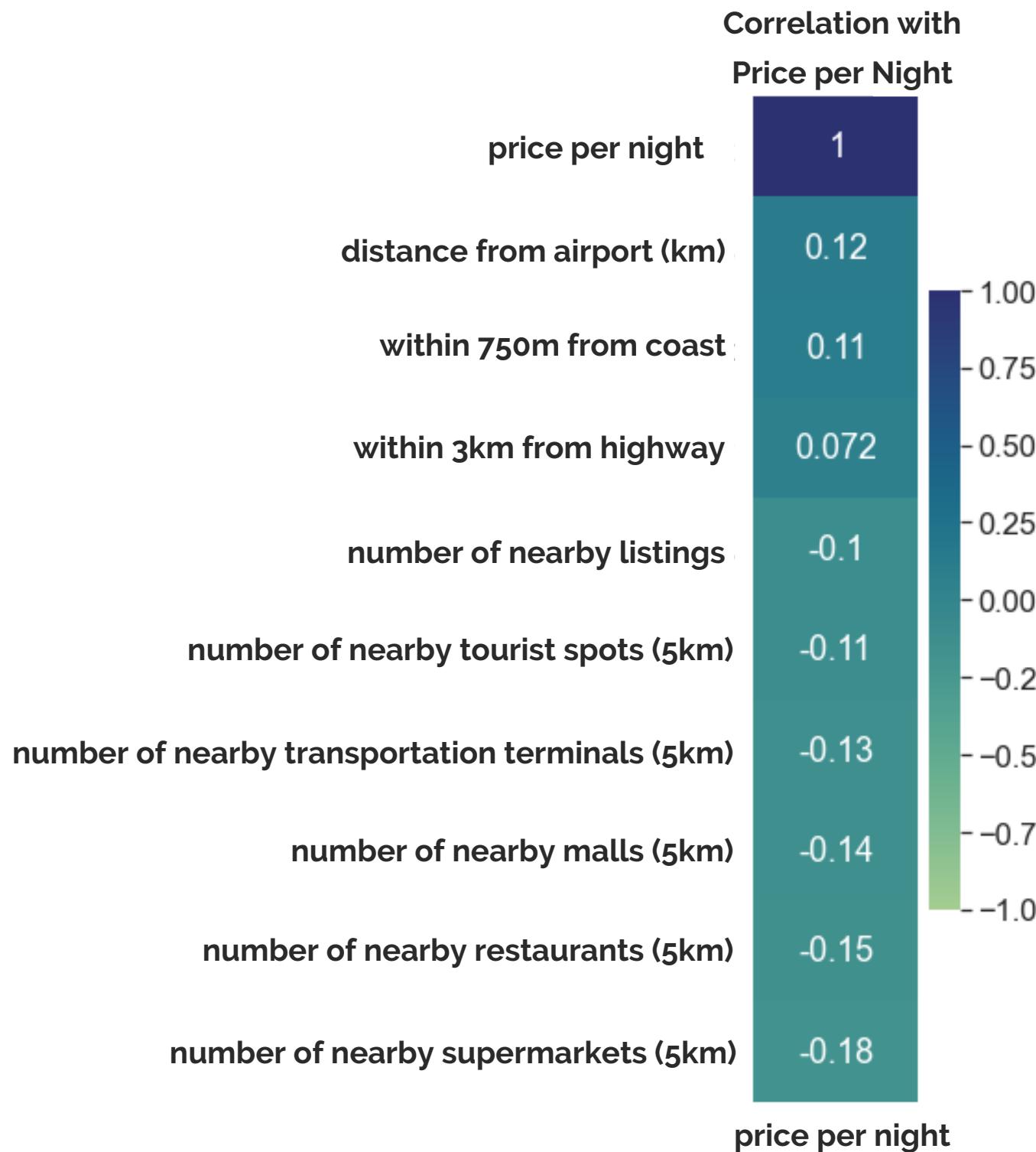
The more the merrier

Number of Guest

- ✓ strongest correlation with price per night
- ✓ top predictor for the pricing
- ✓ increase the guest capacity by adding more beds



Spatial is Special



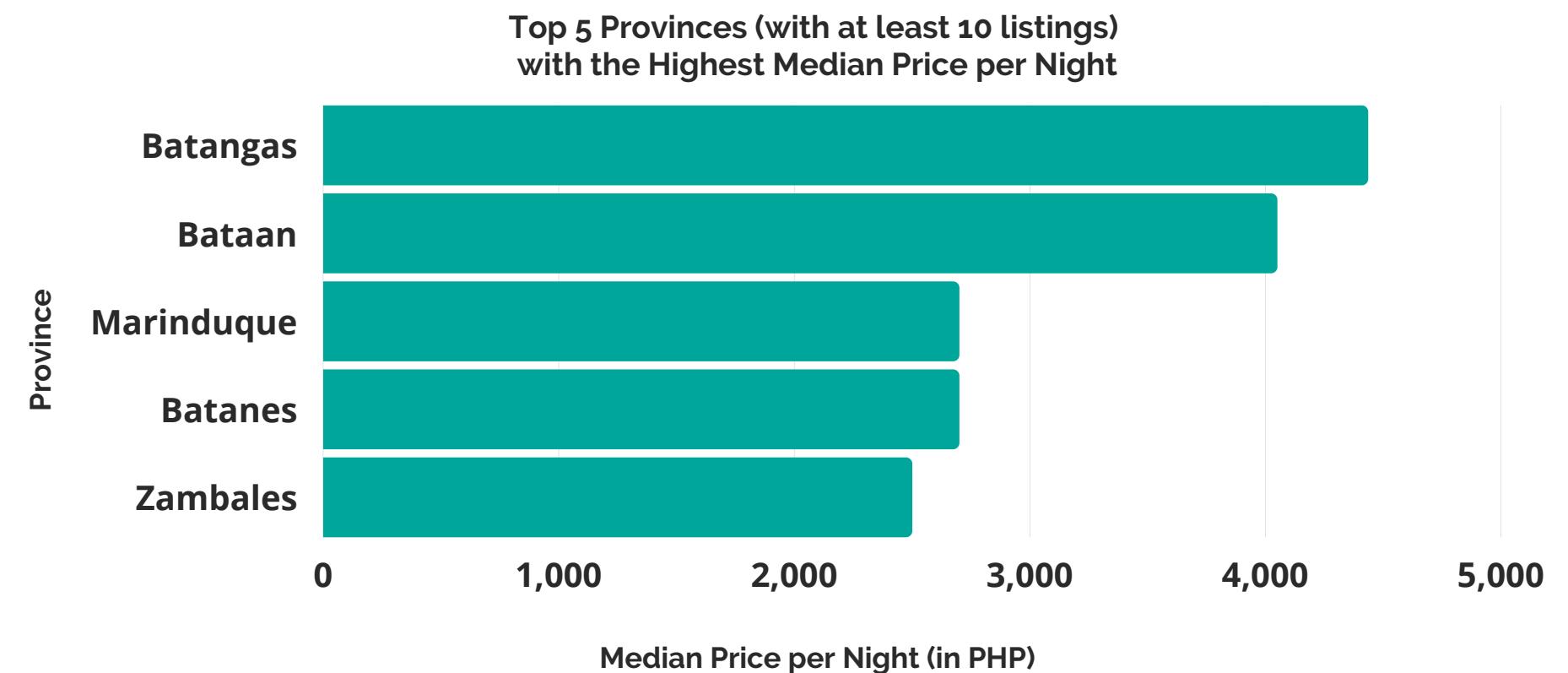
Distance from Airport

- ✓ most correlated spatial feature with price per night
- ✓ important predictor for the pricing



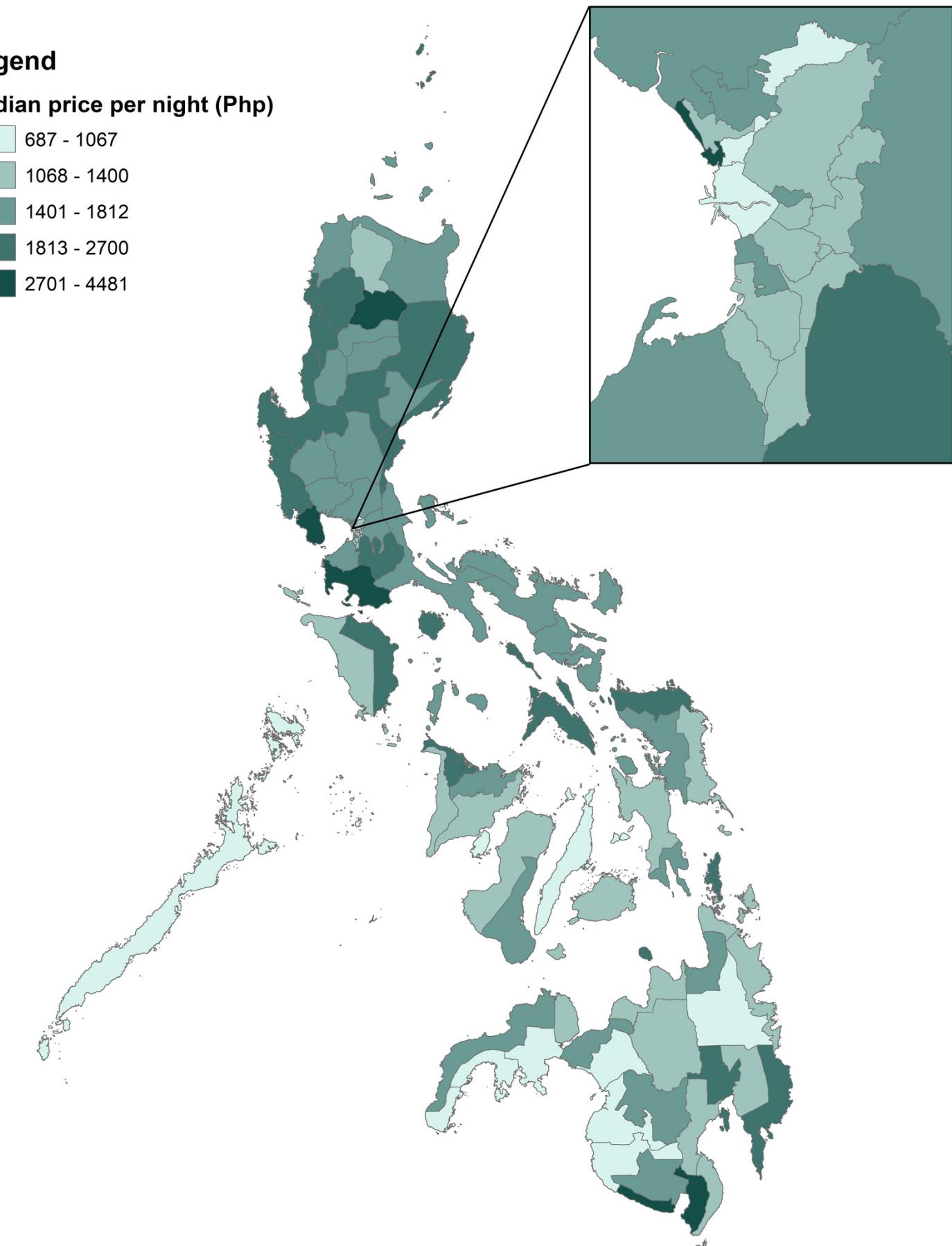
listings near coastline and far from airports tend to have higher prices

You're in the right place



Legend

Median price per night (Php)
687 - 1067
1068 - 1400
1401 - 1812
1813 - 2700
2701 - 4481



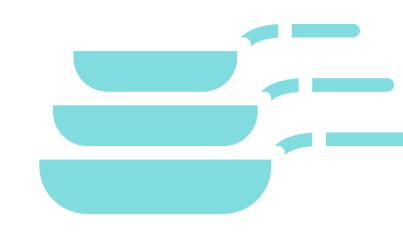
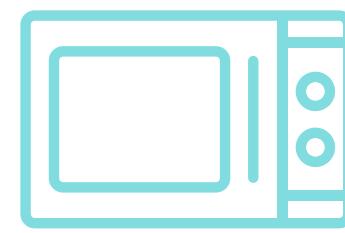
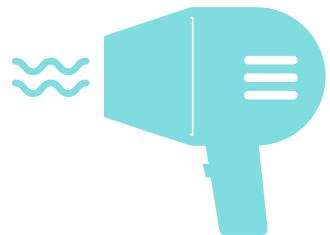
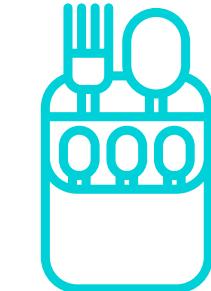
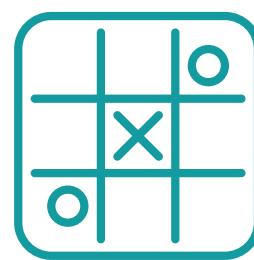
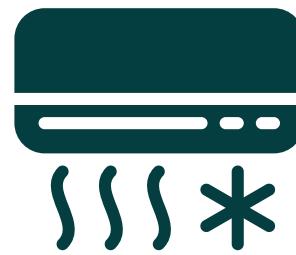
Batangas has the highest median price per night



Median prices in mainland Luzon are generally higher.
Yet, the median prices in NCR are generally lower

Amenity is a necessity

Must haves...





**Thank
you!**