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TBD

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*Code and data are available at: https://github.com/iJustinn/House_Price.git

Table 1: Summary statistics of the California housing dataset

Table 2: Count of missing values for each variable

1 Introduction

2 Data

Data used in this paper was cleaned, processed and tested with the programming language R (R Core Team 2022). Also with support of additional packages in R: `tidyverse` (Wickham et al. 2019), `ggplot2` (Wickham 2016), `janitor` (Firke 2023), `readr` (Wickham, Hester, and Bryan 2023), `knitr` (Xie 2014), `modelsummary` (Arel-Bundock 2023), `testthat` (Wickham Year of publication), `KableExtra` (Zhu 2023), `viridis` (Garnier et al. 2018), `lubridate` (Grolemund and Wickham 2021), `maps` (Deckmyn et al. 2021), `mgcv` (Wood 2021).

Table 3: Count of missing values for each variable after cleaning

Table 4: Modeling Results for Linear Models

	Multiple Regression	Polynomial Regression
(Intercept)	−13 969 628.019	212 976.031
	(395 357.616)	(1359.110)
Year	6958.769	
	(196.466)	
NumBedroom	59 897.327	
	(993.637)	
poly(Year, 2)1		3 866 485.706
		(105 994.679)
poly(Year, 2)2		1 601 816.793
		(105 993.208)
poly(NumBedroom, 2)1		6 591 537.312
		(105 993.313)
poly(NumBedroom, 2)2		1 365 656.076
		(105 994.574)
Num.Obs.	6082	6082
R2	0.445	0.479
R2 Adj.	0.445	0.479
AIC	158 396.4	158 018.2
BIC	158 423.3	158 058.5
Log.Lik.	−79 194.199	−79 003.096
F	2440.891	1397.712
RMSE	109 331.51	105 949.60

Table 5

	GAM Regression
(Intercept)	212 976.031
	(1322.680)
Num.Obs.	6082
R2	0.506
AIC	157 697.2
BIC	157 801.7
RMSE	103 028.50

Modeling Results for Non-linear Models

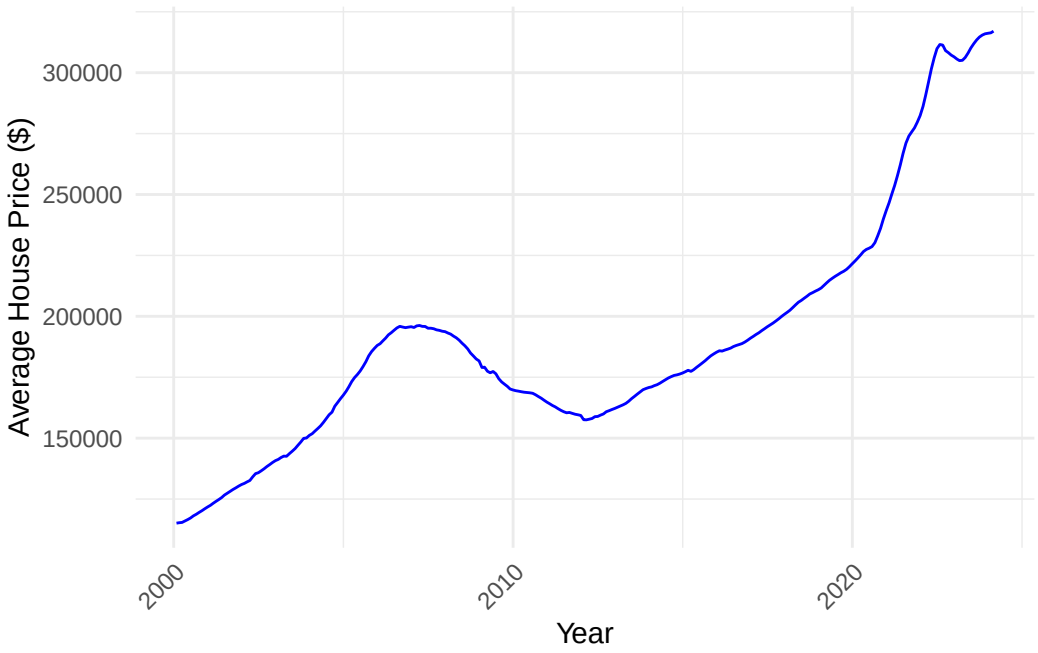

Figure 1: Trend of Average House Price from 2000 to 2024

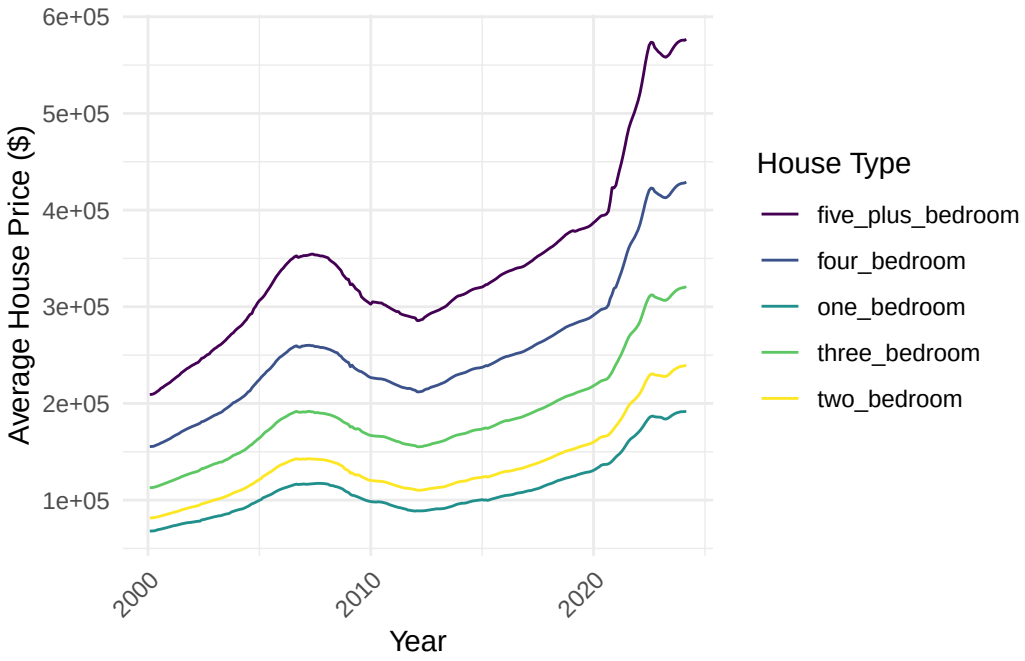

Figure 2: Trend of Average House Price from 2000 to 2024 by House Type

2.1 Source

2.2 Method

3 Results

3.1 Data Trend

3.2 Heat Maps

3.3 Modeling

4 Discussion

4.1 Demographic Shifts

4.2 Health-related Behaviors

4.3 Government Policies

4.4 Environmental Changes

4.5 Possible Improvements

5 Conclusion

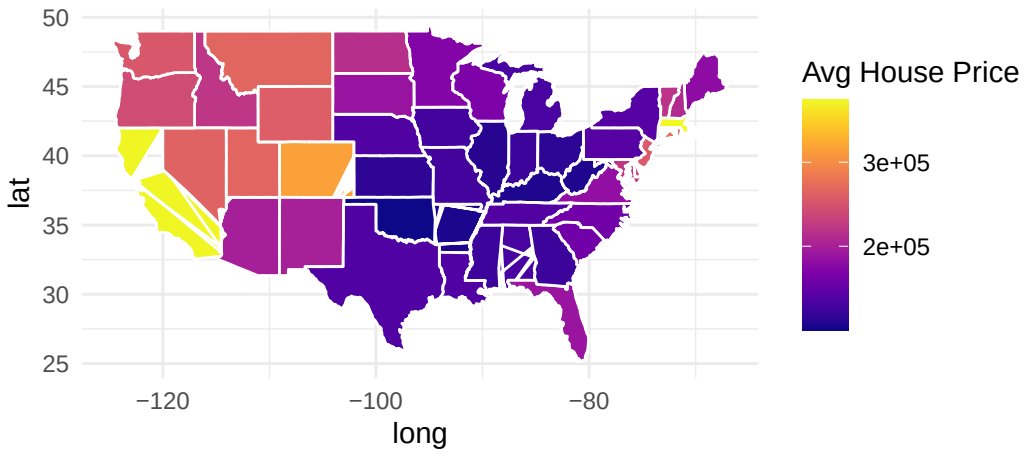

Figure 3: Average Price by State in the US for All House Types

A Appendix

A.1 Datasheet

Motivation

Composition

Collection process

Preprocessing/cleaning/labeling

Uses

Distribution

Maintenance

References

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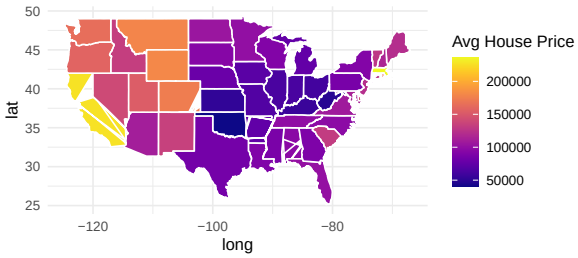
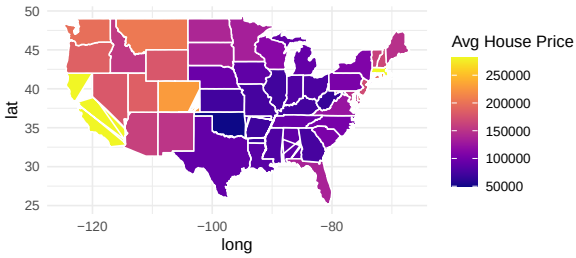
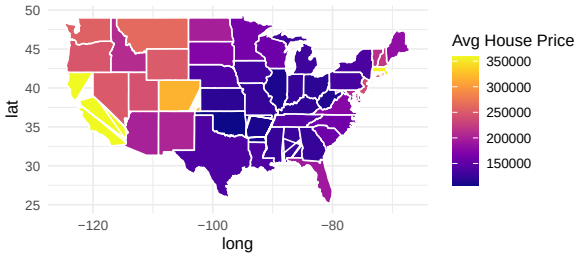


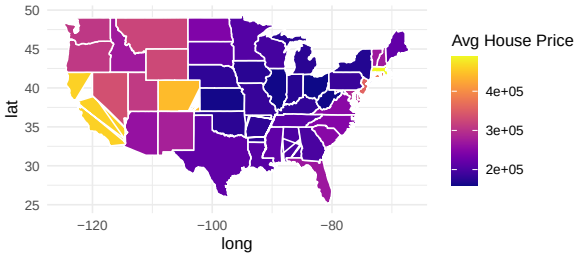
(a) one bedroom



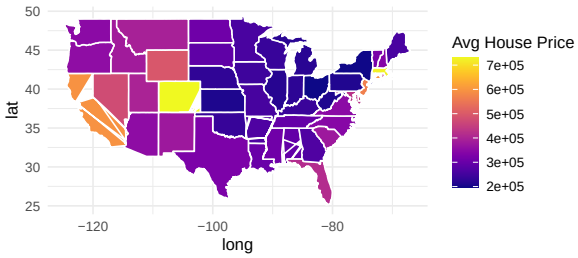
(b) two bedrooms



(c) three bedrooms



(d) four bedrooms



(e) five plus bedrooms

Figure 4: Average Price by State in the US for Different House Types

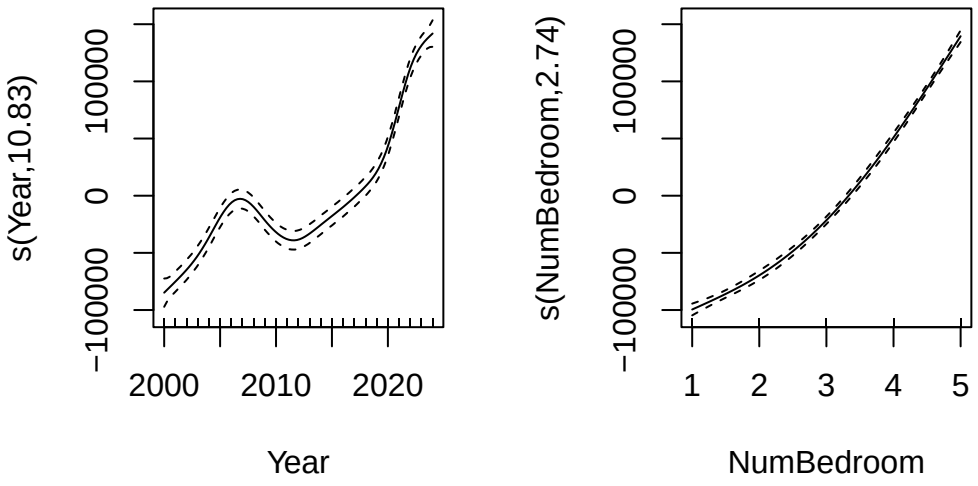

s(Year,10.83)
−100000
0
100000
2000
2010
2020
Year
s(NumBedroom,2.74)
−100000
0
100000
1
2
3
4
5
NumBedroom

Figure 5