Airbnb price prediction

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Contents

- About Data & Project Purpose

- Project purpose

- EDA

- Model & Result

Data

- kaggle airbnb price prediction
  - https://www.kaggle.com/stevezhenghp/airbnb-price-prediction
    - 29 variables including log_price

Project purpose

- 제공된 변수들을 이용하여 Airbnb reservation price 예측 및 유의 변수 찾기
  - two type of dependent variables
    - 'log_price' : raw data
    - binary 'log_price' : (log_price>median : 1, log_price<median : 0)
  - two type of setting
    - without 'amenities'
    - with 'amenities'

Data

- Quantitative
  - Continuous
    - log_price
  - Discrete
    - accommodates, bathrooms, number_of_reviews, review_scores_rating, bedrooms, beds, host_response_rate
- Qualitative
  - Nominal
    - property_type, room_type, bed_type, cleaning_fee, city, host_has_profile_pic, host_identity_verified, host_response_rate, instant_bookable, property_type,
  - Ordinal
    - cancellation_policy
- Not used
  - id, description, first_review, last_review, name, neighbourhood, thumbnail_url, zipcode, latitude, longitude, host_response_rate, host_since
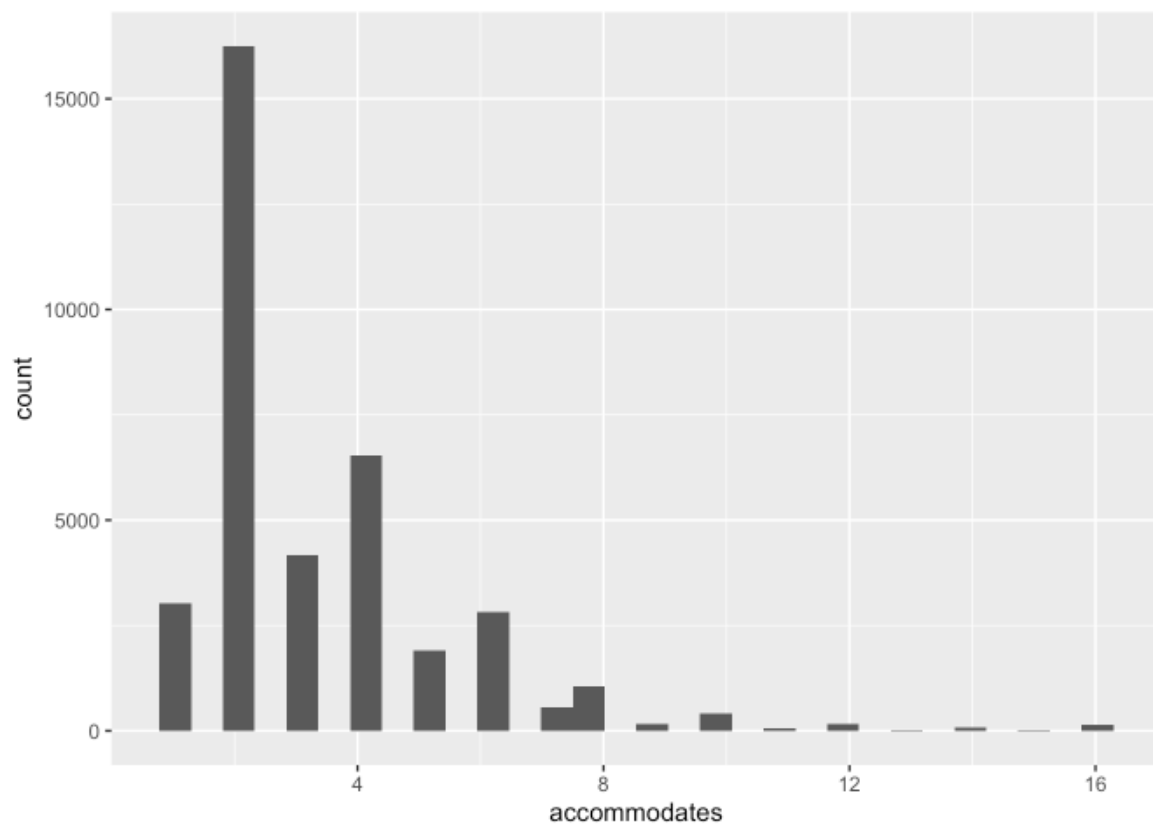
Data - log_price
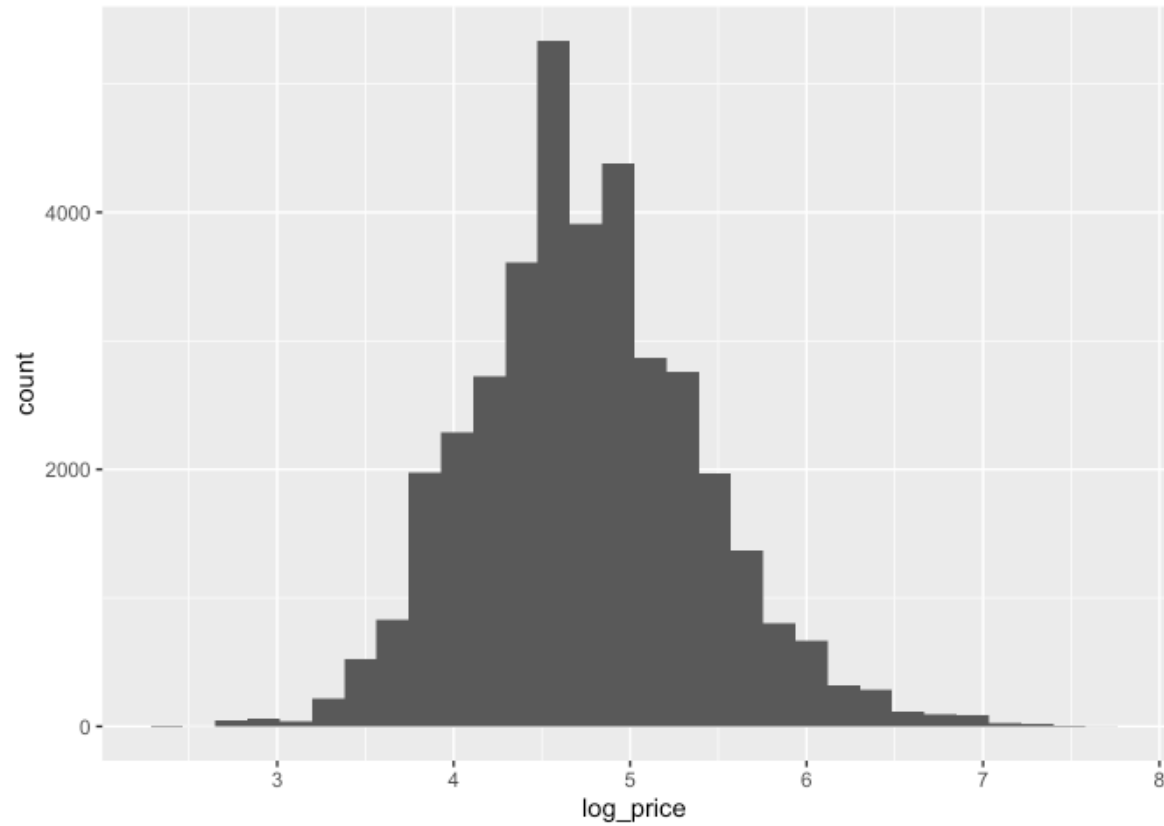

```
summary(data$log_price)
```

```
##     Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    2.303   4.317   4.700   4.756   5.165   7.600
```

Data - accomodates


```
summary(as.factor(data$accommodates))
```
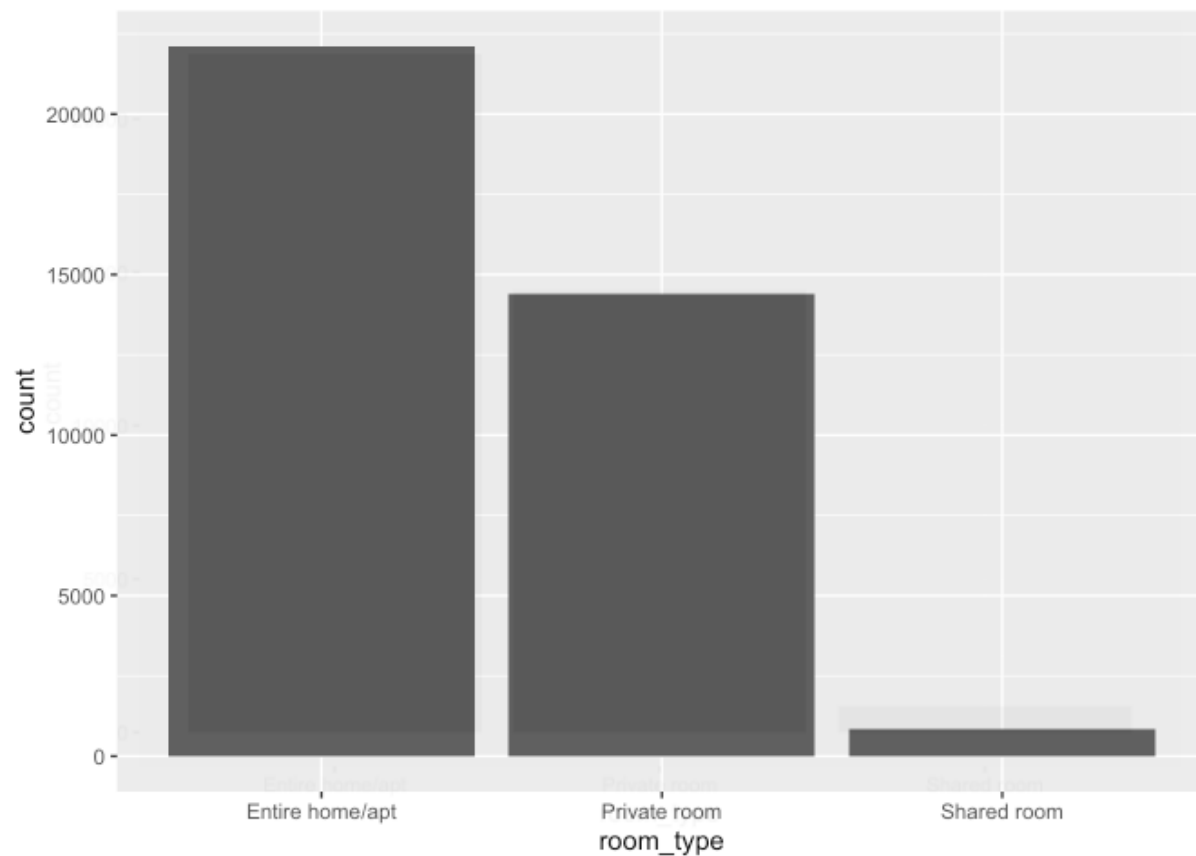
```
##      1     2     3     4     5     6     7     8     9    10    11    12    13
##   3019 16252  4170  6538  1899  2814   560  1046   161   418    53   153    24
##     14    15    16
##     70    28   140
```

Data- room_type
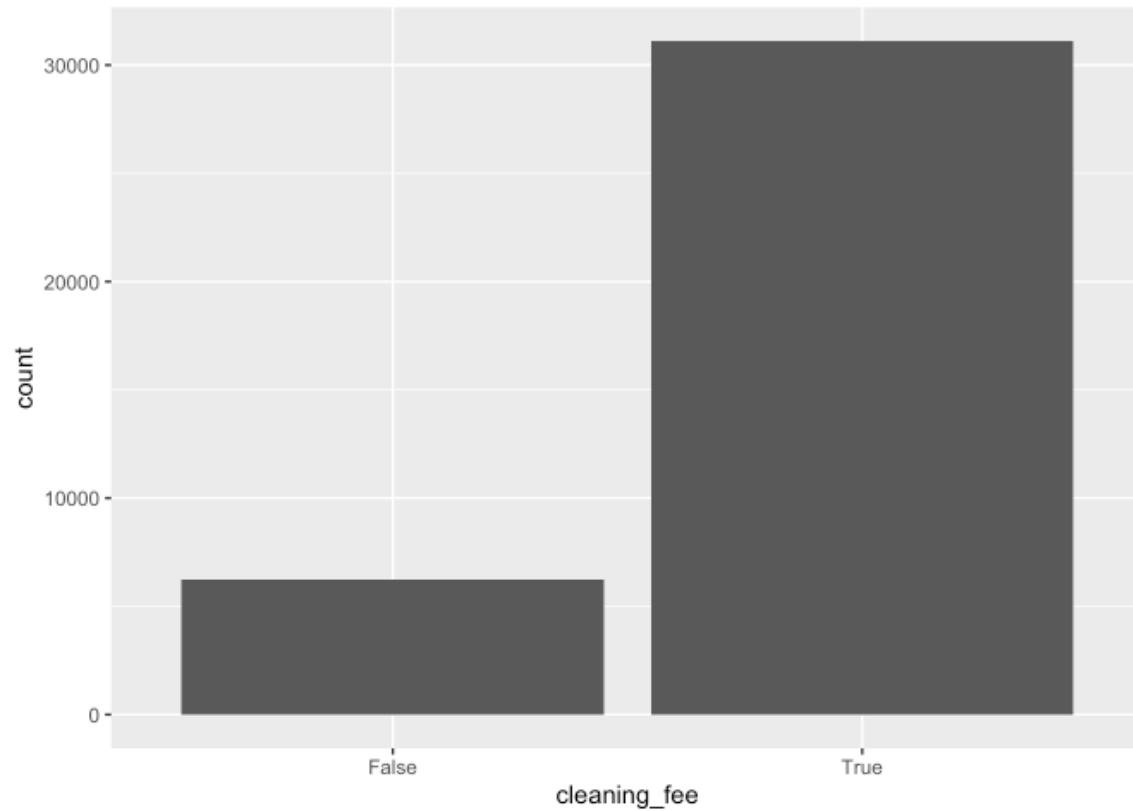
Data - cleaning_fee


```
summary(data$cleaning_fee) # 2
```

```
## False  True
##  6224 31121
```

Data - cancellation_policy


```
summary(data$cancellation_policy) # Ordinal : Flexible < Moderate < Strict < super_strict_30 < super_strict_60
```

```
##        flexible       moderate          strict super_strict_30 super_strict_60
##           5839          11506           19955              42               3
```
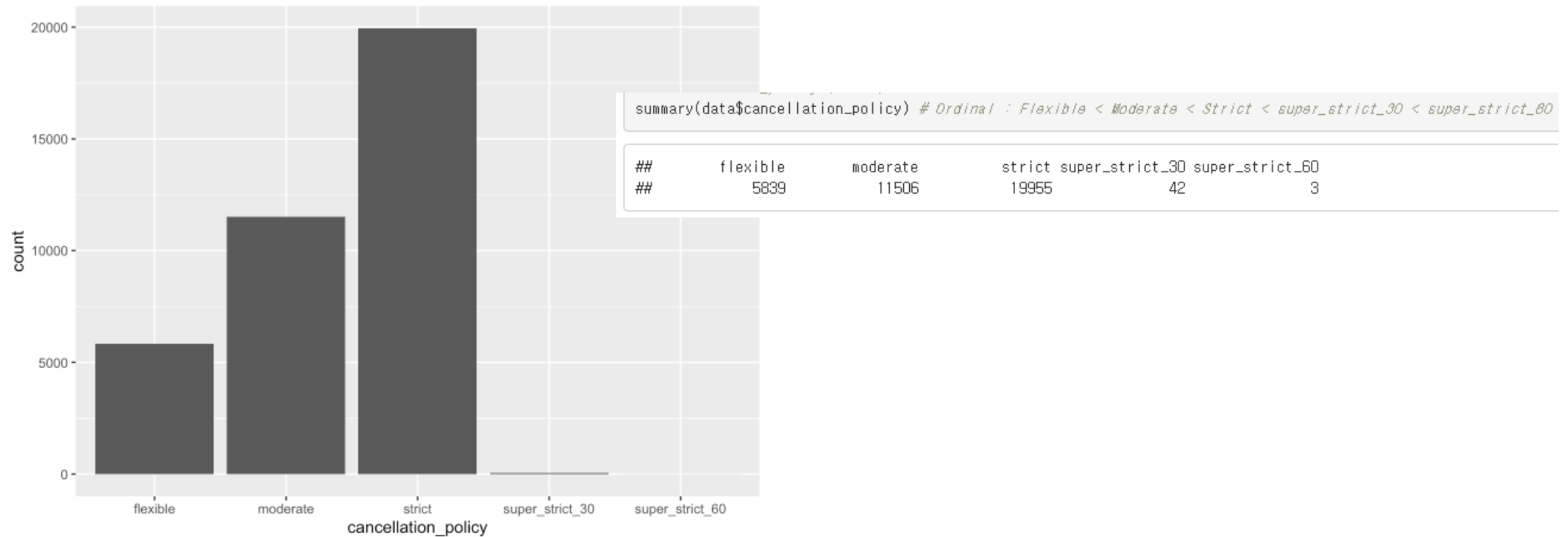
EDA

- remove NA row

- cancellation_policy
  - super_strict_30 & super_string_60 -> strict

- amenities
  - too many type

EDA - amenities

amenities
{""Wireless Internet"",""Air conditioning"",Kitchen,Heating,""Family/kid friendly"",Essentia...
{""Wireless Internet"",""Air conditioning"",Kitchen,Heating,""Family/kid friendly"",Washer,...
{TV,""Cable TV"",""Wireless Internet"",""Air conditioning"",Kitchen,Breakfast,""Buzzer/wir...
{TV,""Cable TV"",Internet,""Wireless Internet"",Kitchen,""Indoor fireplace"",""Buzzer/wirel...
{TV,Internet,""Wireless Internet"",""Air conditioning"",Kitchen,""Elevator in building"",Hea...
{TV,""Wireless Internet"",Heating,""Smoke detector"",""Carbon monoxide detector"",""Fir...
{TV,Internet,""Wireless Internet"",""Air conditioning"",Pool,Kitchen,""Free parking on pre...
{TV,""Cable TV"",""Wireless Internet"",""Wheelchair accessible"",Pool,Kitchen,""Free parki...
{TV,""Cable TV"",""Wireless Internet"",""Pets live on this property"",Dog(s),Heating,""Smo...
{""Wireless Internet"",""Air conditioning"",Kitchen,""Free parking on premises"",Heating,"...
{Internet,""Wireless Internet"",""Air conditioning"",Kitchen,""Pets allowed"",""Buzzer/wirel...
{TV,""Cable TV"",Internet,""Wireless Internet"",Kitchen,""Free parking on premises"",Heati...
{TV,Internet,""Wireless Internet"",Kitchen,""Free parking on premises"",""Pets allowed"","...
{TV,""Cable TV"",Internet,""Wireless Internet"",""Air conditioning"",Kitchen,""Free parking...
{Kitchen,Heating,""Smoke detector"",""Carbon monoxide detector"",Essentials,""Hair dry...
{Internet,""Wireless Internet"",""Air conditioning"",Kitchen,""Indoor fireplace"",""Buzzer/...
{TV,""Wireless Internet"",Kitchen,""Pets allowed"",Breakfast,""Pets live on this property"",...
{Internet,""Wireless Internet"",""Air conditioning"",Kitchen,""Hot tub"",Heating,""Family/k...
{TV,""Cable TV"",Internet,""Wireless Internet"",""Air conditioning"",""Wheelchair accessibl...

EDA - amenities

Wireless.Internet.	Air.conditioning.	Kitchen.	Heating.	Family.kid.friendly.	Essentials.	Hair.dryer.	Iron.	Washer.	Dryer.	Smoke.detector.	Fire.extinguisher.	Shampoo.	Hangers.
TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE
TRUE	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE
TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE
TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	TRUE
TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE
TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE
TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE
TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
FALSE	FALSE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE
TRUE	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE
TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE
TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE

Model

- continuous 'log_price' (raw)

  - multiple linear regression

  - lasso

  - xgboost

- binary 'log_price' (enconded)

  - logistic regression

  - lasso

  - xgboost

Result – Continuous

Setting	Statistical Method	RMSE	MAE	MAPE
Setting 1 w/o amenities (12 Variables)	Multiple Linear Regression	0.3955	0.3055	0.0653
	LASSO	0.3991	0.3081	0.0659
	XGBoost	0.3823	0.2944	0.0628
Setting 2 w/ amenities (149 Variables)	Multiple Linear Regression	0.3775	0.2902	0.0621
	LASSO	0.3829	0.2944	0.0631
	XGBoost	0.3619	0.2760	0.0589

1) Linear Regression

```
Call:
glm(formula = log_price ~ ., family = "gaussian", data = set1_data_train)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-3.5439  -0.2546  -0.0137   0.2413   2.8080

Coefficients:
                              Estimate Std. Error t value Pr(>|t|)
(Intercept)                  3.1786366  0.0497277  63.921  < 2e-16 ***
property_typeBed & Breakfast 0.0861994  0.0289328   2.979  0.00289 **
property_typeBoat            0.0751791  0.1091821   0.689  0.49110
property_typeBoutique hotel -0.0145021  0.0861247  -0.168  0.86628
property_typeBungalow       -0.0397360  0.0311564  -1.275  0.20219
property_typeCabin          -0.0917168  0.0666711  -1.376  0.16894
property_typeCamper/RV      -0.2787379  0.0657607  -4.239 2.26e-05 ***
property_typeCastle          0.1607808  0.1605343   1.002  0.31658
property_typeCave            0.2701901  0.2780282   0.972  0.33115
property_typeChalet          0.0535468  0.3931290   0.136  0.89166
property_typeCondominium     0.0757207  0.0144155   5.253 1.51e-07 ***
property_typeDorm           -0.3250719  0.0592717  -5.484 4.19e-08 ***
property_typeEarth House     0.4117582  0.3930852   1.048  0.29488
property_typeGuest suite    -0.0936749  0.0581335  -1.611  0.10711
property_typeGuesthouse     -0.1129166  0.0282073  -4.003 6.27e-05 ***
property_typeHostel         -0.5917116  0.0822875  -7.191 6.62e-13 ***
property_typeHouse          -0.0636227  0.0065920  -9.651  < 2e-16 ***
property_typeHut            -0.3698976  0.1966272  -1.881  0.05995 .
property_typeIn-law         -0.2052708  0.0678087  -3.027  0.00247 **
property_typeIsland          0.7711316  0.3931459   1.961  0.04984 *
```

```
property_typeLoft                  0.1467079  0.0182155   8.054 8.35e-16 ***
property_typeOther                -0.0418042  0.0289672  -1.443  0.14899
property_typeServiced apartment    0.0005339  0.1758345   0.003  0.99758
property_typeTent                 -0.3128002  0.1311842  -2.384  0.01711 *
property_typeTimeshare             0.3190784  0.1606008   1.987  0.04696 *
property_typeTipi                  0.2465612  0.2779754   0.887  0.37509
property_typeTownhouse            -0.0465561  0.0167194  -2.785  0.00536 **
property_typeTrain                 0.4073624  0.3930896   1.036  0.30007
property_typeTreehouse             0.4111186  0.1966705   2.090  0.03659 *
property_typeVacation home         0.3640614  0.2270853   1.603  0.10890
property_typeVilla                -0.1124916  0.0571263  -1.969  0.04894 *
property_typeYurt                  0.0902302  0.2780057   0.325  0.74551

bathrooms                          0.1412314  0.0056476  25.007  < 2e-16 ***
cancellation_policymoderate        0.0261193  0.0077312   3.378  0.00073 ***
cancellation_policystrict          0.0778169  0.0073828  10.540  < 2e-16 ***
cleaning_feeTrue                   0.0003897  0.0069744   0.056  0.95544
cityChicago                       -0.3573289  0.0147105 -24.291  < 2e-16 ***
cityDC                            -0.1586150  0.0143805 -11.030  < 2e-16 ***
cityLA                            -0.1726882  0.0120567 -14.323  < 2e-16 ***
cityNYC                           -0.0289032  0.0117662  -2.456  0.01404 *
citySF                             0.2315695  0.0137062  16.895  < 2e-16 ***
host_identity_verifiedt            0.0159386  0.0059079   2.698  0.00698 **
instant_bookablet                 -0.0447622  0.0055298  -8.095 5.99e-16 ***
review_scores_rating               0.0143662  0.0005005  28.701  < 2e-16 ***
bedrooms                           0.1572802  0.0047335  33.227  < 2e-16 ***
beds                              -0.0330529  0.0035946  -9.195  < 2e-16 ***
```

Setting 1, w/o amenities

1) Linear Regression

|	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	3.27009043	0.0517399258	63.202457	0.000000e+00
property_typeDorm	-0.30135941	0.0568075889	-5.304915	1.136565e-07
property_typeHostel	-0.60669352	0.0789269841	-7.686769	1.562692e-14
property_typeLoft	0.11544515	0.0175464101	6.579417	4.813588e-11
room_typePrivate room	-0.58519822	0.0065549824	-89.275331	0.000000e+00
room_typeShared room	-1.09022625	0.0171832369	-63.447082	0.000000e+00
accommodates	0.05941046	0.0023673766	25.095483	2.494074e-137
bathrooms	0.11048442	0.0055014550	20.082764	5.023406e-89
cancellation_policystrict	0.05955276	0.0071629420	8.314009	9.703662e-17
cityChicago	-0.35578449	0.0146112468	-24.350043	1.689597e-129
cityDC	-0.16078925	0.0143820986	-11.179819	5.969438e-29
cityLA	-0.17780006	0.0126186313	-14.090281	6.402316e-45
cityNYC	-0.04055773	0.0117711359	-3.445524	5.708627e-04
citySF	0.21702687	0.0143162666	15.159460	1.097122e-51
instant_bookablet	-0.02825250	0.0054470888	-5.186716	2.156537e-07
review_scores_rating	0.01271343	0.0004993417	25.460379	3.033693e-141
bedrooms	0.15797948	0.0045809548	34.486147	8.100770e-255
beds	-0.02977864	0.0034593802	-8.608084	7.846388e-18
Hair.dryer.TRUE	0.04826396	0.0074293430	6.496396	8.376816e-11
Shampoo.TRUE	0.03511929	0.0063807618	5.503933	3.749495e-08
TV.TRUE	0.04767506	0.0061325694	7.774076	7.883112e-15
Cable.TV.TRUE	0.07563185	0.0054805641	13.800013	3.630705e-43
Buzzer.wireless.intercom.TRUE	0.07086327	0.0060918043	11.632558	3.369789e-31
Indoor.fireplace.TRUE	0.10288143	0.0076286823	13.486133	2.607518e-41
Pool.TRUE	0.04343082	0.0115202841	3.769943	1.636493e-04
Free.parking.on.premises.TRUE	-0.05600794	0.0060056025	-9.325948	1.185577e-20
Gym.TRUE	0.03855126	0.0111443087	3.459278	5.425021e-04
Doorman.TRUE	0.13386924	0.0126899848	10.549204	5.787916e-26
Lock.on.bedroom.door.TRUE	-0.04313037	0.0063013408	-6.844634	7.839143e-12
Private.entrance.TRUE	-0.05255180	0.0081591192	-6.440867	1.208890e-10
Suitable.for.events.TRUE	0.06180768	0.0109655463	5.636534	1.753207e-08
Elevator.TRUE	0.07972482	0.0089068575	8.950948	3.756379e-19
Microwave.TRUE	-0.11259963	0.0227209758	-4.955757	7.250618e-07
Dishwasher.TRUE	0.11471009	0.0188196579	6.095227	1.108343e-09
Private.living.room.TRUE	0.06257665	0.0158006524	3.960384	7.503059e-05
Crib.TRUE	0.13315793	0.0320381144	4.156235	3.245803e-05

Setting 2, w/ amenities

2) LASSO

(Intercept)	property_typeCondominium	property_typeLoft	accommodates
3.39337443	0.03860552	0.10772688	0.05176123
bathrooms	cancellation_policystrict	citySF	review_scores_rating
0.11637074	0.04720360	0.24133936	0.01216824
bedrooms			
0.14488003			

Setting 1, w/o amenities

(Intercept)	property_typeLoft	accommodates	bathrooms
3.453913860	0.075954838	0.049283739	0.093904918
cancellation_policystrict	citySF	review_scores_rating	bedrooms
0.033345885	0.254126211	0.010509052	0.147652621
Dryer.TRUE	Shampoo.TRUE	TV.TRUE	Cable.TV.TRUE
0.025072928	0.005245397	0.035015406	0.068141176
Buzzer.wireless.intercom.TRUE	Indoor.fireplace.TRUE	Pool.TRUE	Gym.TRUE
0.079522738	0.090219834	0.009164794	0.029218409
Doorman.TRUE	Suitable.for.events.TRUE	Elevator.TRUE	Dishwasher.TRUE
0.130746078	0.028675516	0.095688259	0.031548454

Setting 2, w/ amenities
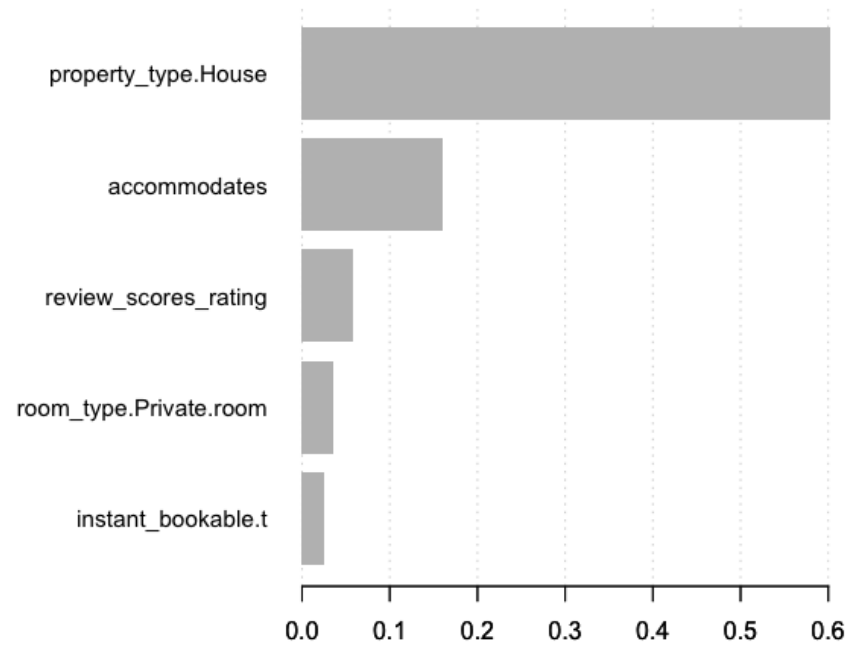
3) XGBoost

Setting 1, w/o amenities
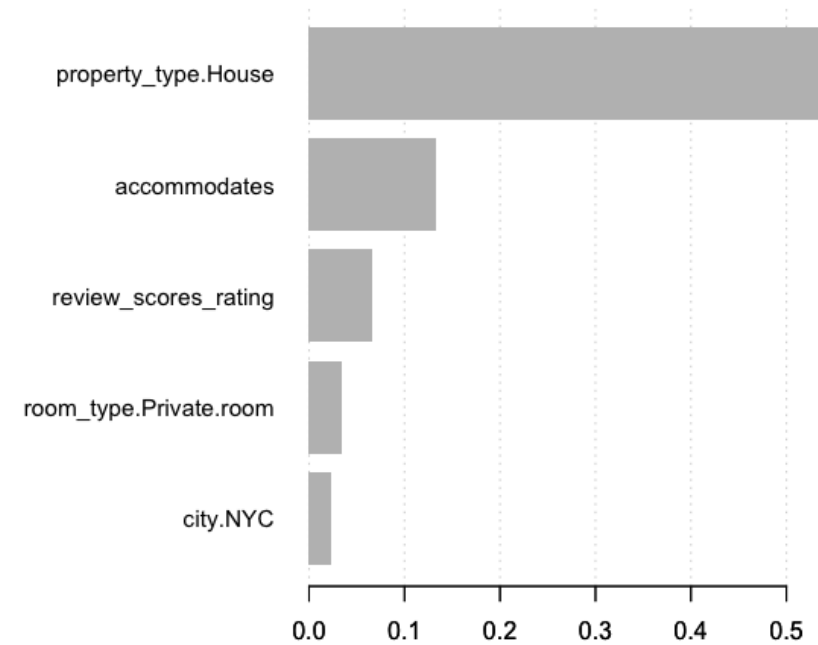
Setting 2, w/ amenities

Result – Binary

Setting	Statistical Method	Accuracy	Sensitivity	Specificity
Setting 1 w/o amenities (12 Variables)	Logistic Regression	0.8212	0.7963	0.8464
	LASSO	0.8195	0.7738	0.8660
	XGBoost	0.8210	0.7954	0.8469
Setting 2 w/ amenities (149 Variables)	Logistic Regression	0.8272	0.8086	0.8460
	LASSO	0.8241	0.7867	0.8622
	XGBoost	0.8330	0.8126	0.8538

1) Logistic Regression

```
Call:
glm(formula = log_price ~ ., family = "binomial", data = set1_data_binary_train)

Deviance Residuals:
    Min       1Q    Median       3Q       Max
-3.8124  -0.5389    0.0218    0.6417    3.1016

Coefficients:
                                  Estimate Std. Error z value Pr(>|z|)
(Intercept)                      -7.030445    0.371789 -18.910  < 2e-16 ***
property_typeBed & Breakfast      0.531048    0.207122   2.564 0.010349 *
property_typeBoat                 0.290495    0.686131   0.423 0.672017
property_typeBoutique hotel      -0.357564    0.632163  -0.566 0.571652
property_typeBungalow            -0.257042    0.177698  -1.447 0.148034
property_typeCabin               -0.699710    0.388283  -1.802 0.071535 .
property_typeCamper/RV           -1.090153    0.413905  -2.634 0.008443 **
property_typeCastle               2.387025    1.269674   1.880 0.060104 .
property_typeCave                14.783475 594.556822   0.025 0.980163
property_typeChalet              11.459866 882.743380   0.013 0.989642
property_typeCondominium          0.525653    0.109716   4.791 1.66e-06 ***
property_typeDorm               -12.576365 111.595891  -0.113 0.910272
property_typeEarth House         12.393787 882.743377   0.014 0.988798
property_typeGuest suite         -1.115971    0.365351  -3.055 0.002254 **
property_typeGuesthouse          -0.426425    0.160179  -2.662 0.007764 **
property_typeHostel              -1.048757    0.886073  -1.184 0.236571
property_typeHouse               -0.322332    0.049083  -6.567 5.13e-11 ***
property_typeHut                -14.245819 389.102799  -0.037 0.970794
property_typeIn-law              -0.678954    0.476490  -1.425 0.154184
property_typeIsland              16.872087 882.743378   0.019 0.984751
```

```
property_typeLoft                  0.681152   0.132874   5.126 2.95e-07 ***
property_typeOther                -0.258882   0.195431  -1.325 0.185282
property_typeServiced apartment   -0.132660   1.167590  -0.114 0.909540
property_typeTent                 -0.024195   1.218595  -0.020 0.984159
property_typeTimeshare             0.986534   1.600853   0.616 0.537726
property_typeTipi                  0.741189   2.116034   0.350 0.726134
property_typeTownhouse            -0.333621   0.134168  -2.487 0.012897 *
property_typeTrain                14.139922 882.743377   0.016 0.987220
property_typeTreehouse            -1.456646   3.273429  -0.445 0.656326
property_typeVacation home        14.415226 422.193905   0.034 0.972763
property_typeVilla                -0.074352   0.541392  -0.137 0.890766
property_typeYurt                -13.543625 546.565336  -0.025 0.980231
room_typePrivate room             -2.811245   0.045501 -61.784  < 2e-16 ***
room_typeShared room              -3.904180   0.219093 -17.820  < 2e-16 ***
accommodates                       0.323087   0.020519  15.746  < 2e-16 ***
bathrooms                          0.434901   0.049842   8.726  < 2e-16 ***
cancellation_policymoderate        0.144608   0.054387   2.659 0.007840 **
cancellation_policystrict          0.408137   0.051986   7.851 4.13e-15 ***
cleaning_feeTrue                   0.037251   0.050642   0.736 0.461990
cityChicago                       -1.843629   0.109757 -16.797  < 2e-16 ***
cityDC                            -1.137976   0.103194 -11.028  < 2e-16 ***
cityLA                            -1.086380   0.088669 -12.252  < 2e-16 ***
cityNYC                           -0.318355   0.086267  -3.690 0.000224 ***
citySF                             1.169282   0.102228  11.438  < 2e-16 ***
host_identity_verifiedt            0.024953   0.042011   0.594 0.552541
instant_bookablet                 -0.229117   0.039486  -5.802 6.54e-09 ***
review_scores_rating               0.068408   0.003709  18.446  < 2e-16 ***
bedrooms                           0.573786   0.034172  16.791  < 2e-16 ***
beds                              -0.091088   0.030829  -2.955 0.003131 **
```

Setting 1, w/o amenities

1) Logistic Regression

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	-7.19864673	0.416978117	-17.263848	8.804367e-67
property_typeLoft	0.60461045	0.141078658	4.285627	1.822248e-05
room_typePrivate room	-2.77671911	0.050927235	-54.523265	0.000000e+00
room_typeShared room	-3.94319113	0.222266785	-17.740802	2.030148e-70
accommodates	0.30120192	0.021608408	13.939108	3.664943e-44
bathrooms	0.34287466	0.053590643	6.398032	1.573921e-10
cancellation_policystrict	0.30816076	0.054257754	5.679571	1.350332e-08
cityChicago	-1.97858899	0.118097982	-16.753792	5.312939e-63
cityDC	-1.23930841	0.112204394	-11.045097	2.315177e-28
cityLA	-1.14980442	0.100189362	-11.476313	1.735244e-30
cityNYC	-0.34924781	0.094480612	-3.696502	2.185902e-04
citySF	1.14844596	0.114409945	10.037991	1.037663e-23
instant_bookablet	-0.16586622	0.042128379	-3.937161	8.245121e-05
review_scores_rating	0.06602419	0.004011879	16.457174	7.449812e-61

|				
bedrooms	0.57859060	0.035697282	16.208254	4.409196e-59
Hair.dryer.TRUE	0.22803102	0.056111422	4.063897	4.826022e-05
Shampoo.TRUE	0.20433471	0.049493412	4.128523	3.651002e-05
Hangers.TRUE	-0.21353804	0.060902181	-3.506246	4.544746e-04
TV.TRUE	0.19268740	0.046695079	4.126503	3.683206e-05
Cable.TV.TRUE	0.40836438	0.041167863	9.919494	3.424873e-23
Buzzer.wireless.intercom.TRUE	0.37624663	0.047404729	7.936901	2.072957e-15
Indoor.fireplace.TRUE	0.40771450	0.063689690	6.401578	1.537794e-10
Free.parking.on.premises.TRUE	-0.26845136	0.046329177	-5.794434	6.855200e-09
Doorman.TRUE	0.58763573	0.098430076	5.970083	2.371328e-09
Lock.on.bedroom.door.TRUE	-0.30972618	0.049424756	-6.266620	3.689683e-10
Private.entrance.TRUE	-0.26857112	0.060429122	-4.444399	8.813798e-06
Elevator.TRUE	0.22835624	0.067722139	3.371958	7.463570e-04
Smoking.allowed.TRUE	-0.33941727	0.095480739	-3.554825	3.782314e-04
Dishwasher.TRUE	0.70051722	0.153845824	4.553372	5.279288e-06

Setting 2, w/ amenities

2) LASSO

property_typeCondominium	property_typeLoft	accommodates	cancellation_policystrict
0.02850930	0.02867597	0.02387395	0.02977647
citySF	review_scores_rating	bedrooms	
0.15946377	0.00602663	0.07336278	

Setting 1, w/o amenities

property_typeCondominium	property_typeLoft	accommodates	cancellation_policystrict
0.007019021	0.012667947	0.021770221	0.020744908
citySF	review_scores_rating	bedrooms	Kitchen.TRUE
0.168394989	0.005112757	0.072293144	0.017126845
Dryer.TRUE	TV.TRUE	Cable.TV.TRUE	Buzzer.wireless.intercom.TRUE
0.013006884	0.017753100	0.049216618	0.049548251
Indoor.fireplace.TRUE	Gym.TRUE	Doorman.TRUE	Elevator.TRUE
0.029244473	0.027286386	0.071545663	0.034862078
Dishwasher.TRUE			
0.012667757			

Setting 2, w/ amenities

3) XGBoost
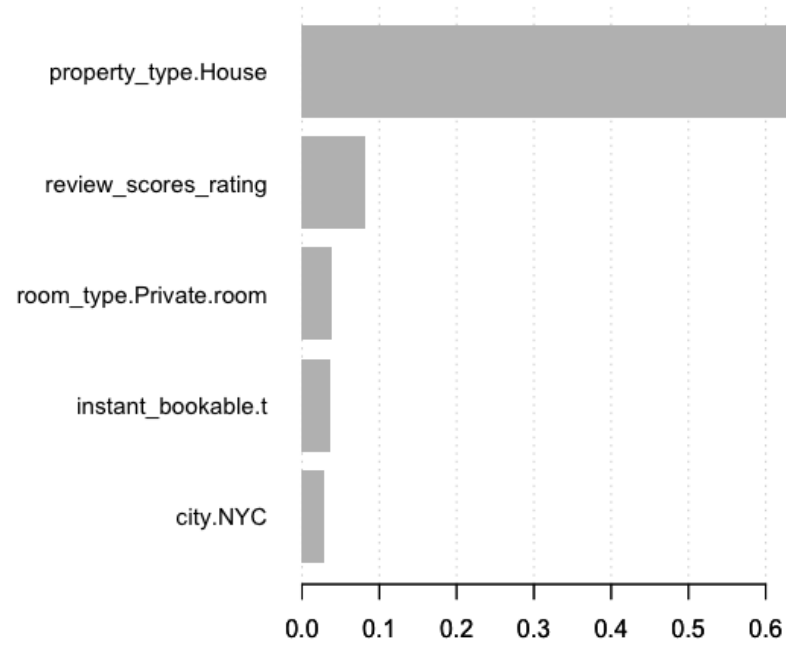
Setting 1, w/o amenities
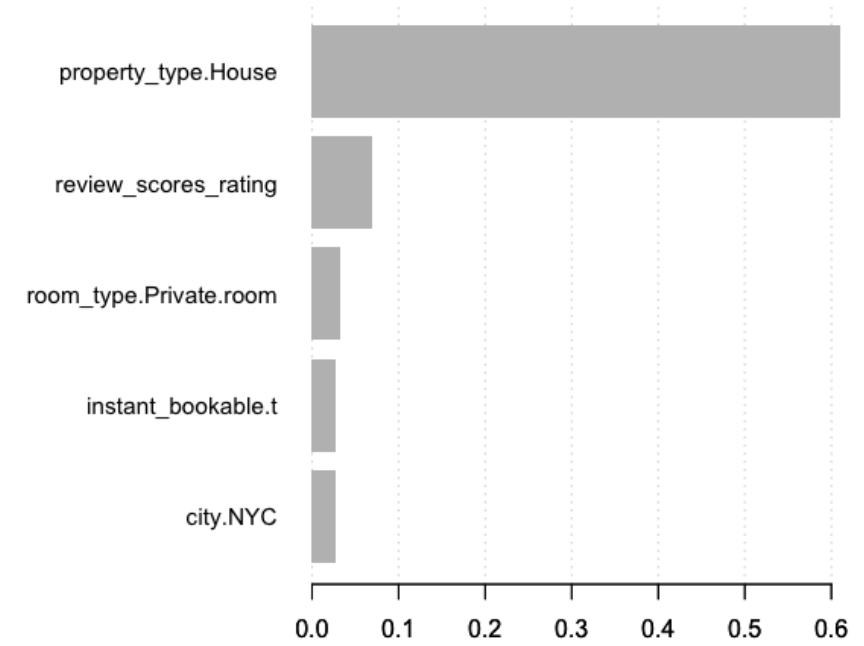
Setting 2, w/ amenities

Thank You