

# Chapter 7: Feature Engineering

Accompanying code for chapter 7 of the book [Applied Data Science in Tourism: Interdisciplinary Approches, Methodologies and Applications](#).

This notebook is available online at <https://github.com/DrDub/artfeateng/tree/master/tourism>.

## MIT License

Copyright 2021 Pablo Duboue

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.



## OS Setup

PySpark uses an embedded Java virtual machine (JVM). If you need to set a specific JVM, uncomment here changing to the path of the JVM

Details: The error message says something in the line of `java.lang.reflect.InaccessibleObjectException: Unable to make private java.nio.DirectByteBuffer(long,int) accessible` see this stack overflow post [Spark doesn't run in Windows anymore](#) for background.

```
In [1]: import os  
# os.environ['JAVA_HOME'] = '/usr/lib/jvm/java-8-openjdk-amd64'
```

This is the set-up for Google Collab. Skip this cell if running locally.

```
In [ ]: !wget http://artoffeatureengineering.com/tourism/listings-cleaned2.csv  
!wget http://artoffeatureengineering.com/tourism/stops.tsv  
!pip install pyspark shap
```

## Imports

```
In [2]: import math  
  
import pyspark  
  
from pyspark.sql import SparkSession  
from pyspark.sql.functions import udf, countDistinct  
from pyspark.sql.types import IntegerType, ArrayType, StringType, DoubleType, BooleanType  
  
from pyspark.ml import Pipeline, UnaryTransformer  
from pyspark.ml.feature import VectorAssembler, CountVectorizer, StringIndexer, Interaction  
from pyspark.ml.regression import RandomForestRegressor  
from pyspark.ml.linalg import VectorUDT  
  
from pyspark.mllib.evaluation import RegressionMetrics  
  
from IPython.display import HTML, display
```

## Setup

```
In [3]: spark = SparkSession.builder.appName('FeatureEngineeringAirbnb').getOrCreate()
```

## Loading the data

This data was downloaded from [InsideAirbnb.com](#), an excellent website created by [Murray Cox](#).

The original data was loaded on a spreadsheet program and the text columns were filtered out as NLP is not the focus of this chapter.

By using "infer schema" Spark will do a two-pass inference of basic data fields.

```
In [4]: alldata = spark.read.csv("listings-cleaned2.csv", inferSchema=True, header=True)
```

We can see how well the inference worked.

```
In [5]: alldata.printSchema()
```

```
root
|-- id: integer (nullable = true)
|-- host_since: string (nullable = true)
|-- host_location: string (nullable = true)
|-- host_response_time: string (nullable = true)
|-- host_response_rate: string (nullable = true)
|-- host_acceptance_rate: string (nullable = true)
|-- host_is_superhost: string (nullable = true)
|-- host_neighbourhood: string (nullable = true)
|-- host_listings_count: integer (nullable = true)
|-- host_total_listings_count: integer (nullable = true)
|-- host_verifications: string (nullable = true)
|-- host_has_profile_pic: string (nullable = true)
|-- host_identity_verified: string (nullable = true)
|-- neighbourhood: string (nullable = true)
|-- neighbourhood_cleansed: string (nullable = true)
|-- neighbourhood_group_cleansed: string (nullable = true)
|-- latitude: double (nullable = true)
|-- longitude: double (nullable = true)
|-- property_type: string (nullable = true)
|-- room_type: string (nullable = true)
|-- accommodates: integer (nullable = true)
|-- bathrooms: string (nullable = true)
|-- bathrooms_text: string (nullable = true)
|-- bedrooms: integer (nullable = true)
|-- beds: integer (nullable = true)
|-- amenities: string (nullable = true)
|-- price: integer (nullable = true)
|-- minimum_nights: integer (nullable = true)
|-- maximum_nights: integer (nullable = true)
|-- minimum_minimum_nights: integer (nullable = true)
|-- maximum_minimum_nights: integer (nullable = true)
|-- minimum_maximum_nights: integer (nullable = true)
|-- maximum_maximum_nights: integer (nullable = true)
```

```
-- minimum_nights_avg_ntm: double (nullable = true)
-- maximum_nights_avg_ntm: double (nullable = true)
-- has_availability: string (nullable = true)
-- availability_30: integer (nullable = true)
-- availability_60: integer (nullable = true)
-- availability_90: integer (nullable = true)
-- availability_365: integer (nullable = true)
-- instant_bookable: string (nullable = true)
-- calculated_host_listings_count: integer (nullable = true)
-- calculated_host_listings_count_entire_homes: integer (nullable = true)
-- calculated_host_listings_count_private_rooms: integer (nullable = true)
-- calculated_host_listings_count_shared_rooms: integer (nullable = true)
```

```
In [6]: table = '<table><tr><th>Column</th><th>Type</th></tr>'
for r in alldata.schema:
    table = '{}<tr><td>{}</td><td>{}</td></tr>'.format(table, r.name, r.dataType.typeName())
table += '</table>'
display(HTML(table))
```

Column	Type
id	integer
host_since	string
host_location	string
host_response_time	string
host_response_rate	string
host_acceptance_rate	string
host_is_superhost	string
host_neighbourhood	string
host_listings_count	integer
host_total_listings_count	integer
host_verifications	string
host_has_profile_pic	string
host_identity_verified	string
neighbourhood	string
neighbourhood_cleansed	string

```
neighbourhood_group_cleansed    string
                                latitude   double
                                longitude  double
                                property_type  string
                                room_type   string
                                accommodates integer
                                bathrooms   string
                                bathrooms_text string
                                bedrooms   integer
                                beds      integer
                                amenities  string
                                price     integer
                                minimum_nights integer
                                maximum_nights integer
                                minimum_minimum_nights integer
                                maximum_minimum_nights integer
                                minimum_maximum_nights integer
                                maximum_maximum_nights integer
                                minimum_nights_avg_ntm  double
                                maximum_nights_avg_ntm  double
                                has_availability string
                                availability_30  integer
                                availability_60  integer
                                availability_90  integer
                                availability_365 integer
                                instant_bookable string
calculated_host_listings_count integer
calculated_host_listings_count_entire_homes integer
```

calculated\_host\_listings\_count\_private\_rooms integer  
calculated\_host\_listings\_count\_shared\_rooms integer

```
In [7]: len(alldata.columns)
```

Out[7]: 45

There are many columns with usable types. Others seem to be assigned `string` when a more suitable type might work (e.g., `date` for `host_since`). But we need to do some EDA on them and for that we need to keep some held-out data to avoid basing our intuitions in the whole dataset (which will not leave additional data to test whether the intuitions are correct).

## Data split

We are using 20% of the data for final testing and 40% of the training data as development test:

```
In [8]: (fulldataset, testData) = alldata.randomSplit([0.8, 0.2], seed=42)
        (dataset, devset)   = fulldataset.randomSplit([0.6, 0.4], seed=42)
```

Let us now peek at the training data to gain some insights.

```
In [9]: dataset.show(vertical=True, truncate=False)
```

-RECORD 0-	
id	13358
host_since	2009/11/07
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.71
host_acceptance_rate	0.71
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'offline_

government_id', 'selfie', 'government_id']	
host_has_profile_pic	f
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	West End
neighbourhood_group_cleansed	null
latitude	49.28209
longitude	-123.12515
property_type	Entire condominium
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Gym', 'Paid parking off premises', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Extra pillows and blankets', 'Dish washer', 'Cooking basics', 'Hot water kettle', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning', 'Elevator']
price	90
minimum_nights	30
maximum_nights	60
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	11
availability_60	41
availability_90	70
availability_365	70
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0

-RECORD 1-----

---



---



---



---



---



---



---



---



---



---

id	16254
----	-------

host_since	2009/12/15
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Hastings-Sunrise
host_listings_count	1
host_total_listings_count	1
host_verifications	['phone', 'facebook', 'offline_government_id', 'selfie', 'go
vernment_id', 'identity_manual']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Hastings-Sunrise
neighbourhood_group_cleansed	null
latitude	49.27734
longitude	-123.04152
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basic skills', 'Private entrance', 'Smoke alarm', 'Hair dryer', 'Lockbox', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Children\u2019s books and toys', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib']
price	195
minimum_nights	3
maximum_nights	31
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	228
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0

calculated_host_listings_count_shared_rooms	0
-RECORD 2-----	
id	17765
host_since	2010/01/07
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Mount Pleasant
host_listings_count	1
host_total_listings_count	1
host_verifications	['phone', 'facebook', 'reviews', 'jumio', 'offline_governmen
t_id', 'selfie', 'government_id']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Mount Pleasant
neighbourhood_group_cleansed	null
latitude	49.26181
longitude	-123.10905
property_type	Entire apartment
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Essentials', 'Washer', 'Long term stays allowed', 'Elevator']
price	94
minimum_nights	3
maximum_nights	60
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	60.0
has_availability	t

availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
-RECORD 3-----	
-----	
-----	
-----	
id	18795
host_since	2010/01/13
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.7
host_acceptance_rate	0.4
host_is_superhost	f
host_neighbourhood	West End
host_listings_count	3
host_total_listings_count	3
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	West End
neighbourhood_group_cleansed	null
latitude	49.28251
longitude	-123.12827
property_type	Private room in house
room_type	Private room
accommodates	2
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Cable TV', 'Wifi', 'Essentials', 'Heating', 'Wa
sher', 'Dryer', 'Long term stays allowed']	
price	50
minimum_nights	30
maximum_nights	360
minimum_minimum_nights	30
maximum_minimum_nights	30

minimum_maximum_nights	360
maximum_maximum_nights	360
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	360.0
has_availability	t
availability_30	9
availability_60	20
availability_90	50
availability_365	325
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	3
calculated_host_listings_count_shared_rooms	0
-RECORD 4-----	
-----	
-----	
id	21913
host_since	2010/02/22
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	t
host_neighbourhood	Renfrew-Collingwood
host_listings_count	3
host_total_listings_count	3
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'selfie', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Renfrew-Collingwood
neighbourhood_group_cleansed	null
latitude	49.23427
longitude	-123.05309
property_type	Entire house
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Microwave', 'Wifi', 'Dryer', 'Carbon mo

noxide alarm', 'Stove', 'Hot water', 'Luggage dropoff allowed', 'Private entrance', 'Smoke alarm', 'Heatin g', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking o n premises', 'Coffee maker', 'Bed linens', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Fire extinguishe r', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV']  
price | 80  
minimum\_nights | 28  
maximum\_nights | 400  
minimum\_minimum\_nights | 28  
maximum\_minimum\_nights | 28  
minimum\_maximum\_nights | 1125  
maximum\_maximum\_nights | 1125  
minimum\_nights\_avg\_ntm | 28.0  
maximum\_nights\_avg\_ntm | 1125.0  
has\_availability | t  
availability\_30 | 2  
availability\_60 | 13  
availability\_90 | 43  
availability\_365 | 318  
instant\_bookable | f  
calculated\_host\_listings\_count | 3  
calculated\_host\_listings\_count\_entire\_homes | 1  
calculated\_host\_listings\_count\_private\_rooms | 2  
calculated\_host\_listings\_count\_shared\_rooms | 0  
-RECORD 5-----

id	24273
host_since	2011/10/09
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	0.82
host_is_superhost	f
host_neighbourhood	Kitsilano
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'jumio', 'offline_government_id', 'government_id']
host_has_profile_pic	f
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Kitsilano
neighbourhood_group_cleansed	null
latitude	49.2626

longitude	-123.17308
property_type	Entire apartment
room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Fireplace guards', 'Carbon monoxide alarm', 'Stove', 'Crib', 'Hot water', 'Babysitter recommendations', 'Garden or backyard', 'Extra pillows and blankets', 'Dishwasher', 'Luggage dropoff allowed', 'Cooking basics', 'Room-darkening shades', 'Private entrance', 'Smoke alarm', 'Baking sheet', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bathtub', 'Coffee maker', 'Bed linens', 'Keypad', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Shower gel', 'Patio or balcony', 'Children\u2019s books and toys', 'High chair', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib', 'TV', 'Ethernet connection']
price	200
minimum_nights	30
maximum_nights	365
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	0
availability_90	10
availability_365	223
instant_bookable	f
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0

-RECORD 6-----

id	42645
host_since	2010/04/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1

host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	4
host_total_listings_count	4
host_verifications	['email', 'phone', 'facebook', 'reviews']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.28001
longitude	-123.12475
property_type	Entire condominium
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Oven', 'Paid parking on premises', 'Paid parking off premises', 'Gym', 'Microwave', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Luggage dropoff allowed', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Coffee maker', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Patio or balcony', 'Children\u2019s books and toys', 'High chair', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib', 'TV', 'Elevator']
price	159
minimum_nights	32
maximum_nights	365
minimum_minimum_nights	32
maximum_minimum_nights	32
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	32.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	29
availability_90	59
availability_365	333
instant_bookable	t
calculated_host_listings_count	4
calculated_host_listings_count_entire_homes	4
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0

-RECORD 7-----

id	54261
host_since	2010/10/05
host_location	Vancouver, British Columbia, Canada
host_response_time	a few days or more
host_response_rate	0
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Downtown Vancouver
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'self ie', 'government_id', 'identity_manual']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27655
longitude	-123.12485
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot tub', 'Gym', 'Indoor fireplace', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free parking on premises', 'Shampoo', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning', 'Elevator']
price	126
minimum_nights	90
maximum_nights	365
minimum_minimum_nights	90
maximum_minimum_nights	90
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365

instant_bookable	f
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
-RECORD 8-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
id	72659
host_since	2011/02/03
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Commercial Drive
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.27357
longitude	-123.07024
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	['Kitchen', 'Lake access', 'Oven', 'Paid parking off premise', 'Gym', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'BBQ grill', 'TV', 'Elevator']
price	210
minimum_nights	7
maximum_nights	21
minimum_minimum_nights	7
maximum_minimum_nights	7

minimum_maximum_nights	21
maximum_maximum_nights	21
minimum_nights_avg_ntm	7.0
maximum_nights_avg_ntm	21.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	40
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
-RECORD 9-----	
-----	
-----	
-----	
id	77157
host_since	2011/02/27
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Arbutus Ridge
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'offline_government_id', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Arbutus Ridge
neighbourhood_group_cleansed	null
latitude	49.24675
longitude	-123.16711
property_type	Private room in guest suite
room_type	Private room
accommodates	3
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Microwave', 'Wifi', 'Laundromat nearby', 'Drye

r', 'Hot water', 'Garden or backyard', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Heating', 'Mini fridge', 'Single level home', 'Hair dryer', 'Lockbox', 'Dedicated workspace', 'First aid kit', 'Iron', 'Body soap', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Barbecue utensils', 'Shower gel', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Conditioner', 'BBQ grill', 'Beach essentials', 'TV', 'Long term stays allowed']

price	75
minimum_nights	3
maximum_nights	60
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	3
availability_60	3
availability_90	3
availability_365	267
instant_bookable	t
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0

-RECORD 10-----

-----

-----

-----

-----

-----

id	111077
host_since	2011/05/09
host_location	North Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0.33
host_is_superhost	f
host_neighbourhood	Grandview-Woodland
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'governme
nt_id']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Grandview-Woodland

neighbourhood_group_cleansed	null
latitude	49.26726
longitude	-123.05969
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	['Kitchen', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Stove', 'Hot water', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Heating', 'Hair dryer', 'Iron', 'Free street parking', 'Coffee maker', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed']
price	125
minimum_nights	3
maximum_nights	365
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	4
availability_60	34
availability_90	64
availability_365	339
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0

-RECORD 11-----

id	125176
host_since	2011/05/24
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Riley Park

host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'offline_governmen
t_id', 'government_id', 'work_email']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Riley Park
neighbourhood_group_cleansed	null
latitude	49.24648
longitude	-123.09241
property_type	Private room in house
room_type	Private room
accommodates	3
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	0
amenities	['Kitchen', 'Hot tub', 'Oven', 'Wifi', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Garden or backyard', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bathtub', 'Free parking on premises', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Patio or balcony', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Long term stays allowed', 'TV']
price	75
minimum_nights	2
maximum_nights	60
minimum_minimum_nights	2
maximum_minimum_nights	2
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	2.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	2
availability_365	268
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	1
calculated_host_listings_count_shared_rooms	0

-RECORD 12-----

---



---



---



---



---



---

id	129163
host_since	2011/05/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Renfrew-Collingwood
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'jumio', 'offline_government_id', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Renfrew-Collingwood
neighbourhood_group_cleansed	null
latitude	49.24507
longitude	-123.04941
property_type	Private room in house
room_type	Private room
accommodates	1
bathrooms	null
bathrooms_text	1 shared bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot water', 'Paid parking on premises', 'Lock on bedroom door', 'Free street parking', 'Cable TV', 'Smoke alarm', 'Wifi', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Carbon monoxide alarm', 'Dishes and silverware', 'TV', 'Long term stays allowed', 'Host greets you', 'Hair dryer', 'Shampoo', 'Fire extinguisher']
price	45
minimum_nights	30
maximum_nights	280
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	280
maximum_maximum_nights	280
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	280.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	1

calculated_host_listings_count_shared_rooms	0
-RECORD 13-----	
id	174135
host_since	2011/07/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Downtown Eastside
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'selfie', 'government_id', 'identity_manual']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown Eastside
neighbourhood_group_cleansed	null
latitude	49.27782
longitude	-123.08985
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Private entrance', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning']
price	100
minimum_nights	30
maximum_nights	365
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	365.0
has_availability	t

availability_30	0
availability_60	0
availability_90	0
availability_365	224
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0

-RECORD 14-----

---



---



---



---



---

id	200643
host_since	2011/08/16
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Strathcona
host_listings_count	4
host_total_listings_count	4
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown Eastside
neighbourhood_group_cleansed	null
latitude	49.27384
longitude	-123.08289
property_type	Private room in house
room_type	Private room
accommodates	4
bathrooms	null
bathrooms_text	2 shared baths
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Garden or backyard', 'Dishwasher', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Room-darkening shades', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib']
price	87

minimum_nights	1
maximum_nights	1125
minimum_minimum_nights	1
maximum_minimum_nights	1
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	1.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	t
calculated_host_listings_count	4
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	4
calculated_host_listings_count_shared_rooms	0

- RECORD 15 -

id	248014
host_since	2011/10/16
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.5
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Grandview-Woodland
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.29103
longitude	-123.05782
property_type	Entire house
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath

bedrooms	2
beds	0
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wifi', 'Host greets you', 'Dryer', 'Stove', 'Carbon monoxide alarm', 'Hot water', 'Garden or backyard', 'Dishwasher', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Free street parking', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Cable TV', 'Refrigerator', 'Hangers', 'Essentials', 'Washer', 'Long term stays allowed', 'BBQ grill', 'TV', 'Cleaning before checkout']
price	100
minimum_nights	31
maximum_nights	180
minimum_minimum_nights	31
maximum_minimum_nights	31
minimum_maximum_nights	180
maximum_maximum_nights	180
minimum_nights_avg_ntm	31.0
maximum_nights_avg_ntm	180.0
has_availability	t
availability_30	4
availability_60	4
availability_90	4
availability_365	113
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0

-RECORD 16-----

-RECORD 16-

id	258636
host_since	2011/08/09
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null

neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27796
longitude	-123.12671
property_type	Entire apartment
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Iron', 'Elevator', 'Gym', 'Hangers', 'Smoke ala rm', 'Wifi', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Free parking on premises', 'Long term stays allowe d', 'Hair dryer', 'Shampoo', 'Dedicated workspace']
price	99
minimum_nights	120
maximum_nights	365
minimum_minimum_nights	120
maximum_minimum_nights	120
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	120.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	11
availability_90	41
availability_365	316
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0

-RECORD 17-

id	283841
host_since	2009/08/10
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.93
host_acceptance_rate	0.88
host_is_superhost	f
host_neighbourhood	Coal Harbour

host_listings_count	49
host_total_listings_count	49
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.2872
longitude	-123.12352
property_type	Entire apartment
room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	3 baths
bedrooms	3
beds	3
amenities	['Kitchen', 'Hot tub', 'Oven', 'Pool', 'Gym', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free parking on premises', 'Coffee maker', 'Dishes and silverware', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning']
price	197
minimum_nights	90
maximum_nights	1125
minimum_minimum_nights	90
maximum_minimum_nights	90
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	41
calculated_host_listings_count_entire_homes	41
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0

-RECORD 18-----

-----

-----

-----

-----

-----

-----

id	323090
host_since	2012/01/01
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0.85
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.28206
longitude	-123.12461
property_type	Entire apartment
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Cooking basics', 'Iron', 'Elevator', 'Gym', 'Hangers', 'Cable TV', 'Smoke alarm', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Carbon monoxide alarm', 'Wifi', 'TV', 'Long term stays allowed', 'Hair dryer', 'Shampoo', 'Dishes and silverware', 'Dedicated workspace']
price	168
minimum_nights	180
maximum_nights	180
minimum_minimum_nights	180
maximum_minimum_nights	180
minimum_maximum_nights	180
maximum_maximum_nights	180
minimum_nights_avg_ntm	180.0
maximum_nights_avg_ntm	180.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	141
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0

-RECORD 19-----

id	359942
host_since	2011/09/23
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Yaletown
host_listings_count	8
host_total_listings_count	8
host_verifications	['email', 'phone', 'facebook', 'reviews']
host_has_profile_pic	t
host_identity_verified	f
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27825
longitude	-123.11865
property_type	Private room in apartment
room_type	Private room
accommodates	2
bathrooms	null
bathrooms_text	1 shared bath
bedrooms	2
beds	1
amenities	['Kitchen', 'Lake access', 'Oven', 'Paid parking on premises', 'Paid parking off premises', 'Gym', 'Microwave', 'Wifi', 'Dryer', 'Stove', 'Hot water', 'Dishwasher', 'Extra pillows and blankets', 'Cooking basics', 'Heating', 'Lock on bedroom door', 'Hair dryer', 'Iron', 'Coffee maker', 'Bed linens', 'Pocket wifi', 'Shampoo', 'Dishes and silverware', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Elevator']
price	240
minimum_nights	30
maximum_nights	1125
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	29
availability_60	59

```
availability_90           | 89
availability_365          | 364
instant_bookable          | f
calculated_host_listings_count | 7
calculated_host_listings_count_entire_homes | 3
calculated_host_listings_count_private_rooms | 4
calculated_host_listings_count_shared_rooms | 0
only showing top 20 rows
```

The string fields will need special processing before we can make sense of them.

Some of them, such as `property_type` seem to have categorical data (specific strings that belong to a small set), we will have to transform them to indices or vector of boolean features (one-hot-encoded).

Others are duplicates of the same information (e.g., "neighbourhood", "neighbourhood\_cleansed" and "neighbourhood\_group\_cleansed"). For such, we will select the one with the highest quality to add to the feature vector.

Finally, `amenities` and `host_verifications` are a set-based features, represented as a strings. That will require quite a bit of processing.

## Transformers

Before analysing how these columns behave with respect to our target value (`price`), let us handle the categorical data encoding it to indexes. This is accomplished in pyspark by using aptly named `Transformer`s named *indexers* (the name is unrelated to deep learning transformers).

In pyspark, we can define different transformers and apply them all together as part of a `Pipeline`. We will be recording the different transformers we will be using in the `stages` list defined below.

```
In [10]: stages = list()
```

## Indexing Categorical Features

For this case study, these three key features will be considered: which neighbourhood the property is in, the type of property and the type of room.

Spark has `StringIndexer`s that are very strict. We will relax them with an "other" category and leave unseen categories and rare categories as other.

```
In [11]: print(dataset.select(countDistinct(dataset.neighbourhood_cleansed)).head()[0])
dataset.groupBy("neighbourhood_cleansed").\
    count().\
    sort("count").\
    show(999, truncate=False)
```

```
23
+-----+-----+
|neighbourhood_cleansed |count|
+-----+-----+
|Strathcona          |16   |
|Kerrisdale           |19   |
|Victoria-Fraserview|21   |
|Killarney            |27   |
|Arbutus Ridge        |28   |
|South Cambie         |31   |
|Shaughnessy          |31   |
|West Point Grey      |35   |
|Oakridge              |45   |
|Sunset                |46   |
|Marpole               |58   |
|Dunbar Southlands    |64   |
|Fairview              |68   |
|Renfrew-Collingwood |68   |
|Hastings-Sunrise     |84   |
|Grandview-Woodland   |97   |
|Riley Park             |105  |
|Downtown Eastside     |112  |
|Mount Pleasant         |142  |
|Kensington-Cedar Cottage|143  |
|West End               |172  |
|Kitsilano              |191  |
|Downtown               |564  |
+-----+-----+
```

```
In [12]: neighbourhood_reduced = set([ p['neighbourhood_cleansed'] \
    for p in dataset.groupBy("neighbourhood_cleansed").\
        count().sort("count").toLocalIterator() \
    if p['count'] > 50])
print(len(neighbourhood_reduced))
neighbourhood_reduced
```

13

```
Out[12]: {'Downtown',
'Downtown Eastside',
'Dunbar Southlands',
'Fairview',
'Grandview-Woodland',
'Hastings-Sunrise',
'Kensington-Cedar Cottage',
'Kitsilano',
'Marpole',
'Mount Pleasant',
'Renfrew-Collingwood',
'Riley Park',
'West End'}
```

In [13]:

```
class SetReducer(UnaryTransformer):
    def __init__(self, valid_set, other_category):
        super(UnaryTransformer, self).__init__()
        self.valid_set = valid_set
        self.other_category = other_category

    def createTransformFunc(self):
        return lambda x: x if x in self.valid_set else self.other_category

    def outputDataType(self):
        return StringType()

    def validateInputType(self, inputType):
        assert inputType == StringType(), f'Expected StringType() and found {inputType}'

neighbourhood_reducer = SetReducer(neighbourhood_reduced, "OTHER") \
    .setInputCol('neighbourhood_cleansed') \
    .setOutputCol('neighbourhood_reduced')
```

In [14]:

```
neighbourhood_reducer.transform(dataset) \
    .groupBy("neighbourhood_reduced") \
    .count() \
    .sort("count") \
    .show(999, truncate=False)
stages.append(neighbourhood_reducer)
```

neighbourhood_reduced	count

Marpole	58
Dunbar Southlands	64
Fairview	68
Renfrew-Collingwood	68
Hastings-Sunrise	84
Grandview-Woodland	97
Riley Park	105
Downtown Eastside	112
Mount Pleasant	142
Kensington-Cedar Cottage	143
West End	172
Kitsilano	191
OTHER	299
Downtown	564

```
In [15]: dataset.groupBy("property_type").\
    count().\
    sort("count").\
    show(999, truncate=False)
```

property_type	count
Private room in hostel	1
Entire timeshare	1
Boat	1
Camper/RV	1
Private room in boat	1
Shared room in loft	1
Private room in loft	1
Entire floor	1
Entire cottage	1
Entire cabin	1
Room in bed and breakfast	2
Entire place	2
Private room in bungalow	3
Shared room in apartment	3
Room in hotel	3
Tiny house	3
Shared room in house	3
Entire villa	5
Room in aparthotel	5
Private room in guesthouse	6
Private room in bed and breakfast	8
Entire bungalow	8

Room in boutique hotel	10
Private room in villa	12
Private room in guest suite	12
Private room in townhouse	17
Entire guesthouse	27
Entire serviced apartment	39
Private room in condominium	40
Entire townhouse	46
Entire loft	57
Private room in apartment	94
Entire guest suite	266
Private room in house	278
Entire house	317
Entire condominium	389
Entire apartment	502

```
In [16]: property_reduced = set([ p['property_type'] \
                           for p in dataset.groupBy("property_type").\
                           count().sort("count").toLocalIterator() \
                           if p['count'] > 50])
property_reduced
```

```
Out[16]: {'Entire apartment',
 'Entire condominium',
 'Entire guest suite',
 'Entire house',
 'Entire loft',
 'Private room in apartment',
 'Private room in house'}
```

```
In [17]: property_reducer = SetReducer(property_reduced, "OTHER") . \
          setInputCol('property_type') . \
          setOutputCol('property_reduced')

property_reducer.transform(dataset) . \
  groupBy("property_reduced") . \
  count() . \
  sort("count") . \
  show(999, truncate=False)
stages.append(property_reducer)
```

property_reduced	count

```

|Entire loft          |57
|Private room in apartment|94
|OTHER                |264
|Entire guest suite   |266
|Private room in house|278
|Entire house         |317
|Entire condominium   |389
|Entire apartment     |502
+-----+-----+

```

In [18]:

```

dataset.groupBy("room_type").\
    count().\
    sort("count").\
    show(999, truncate=False)

```

```

+-----+-----+
| room_type      |count|
+-----+-----+
|Hotel room      |2
|Shared room      |7
|Private room     |486
|Entire home/apt|1672
+-----+-----+

```

In [19]:

```

room_reduced = set([ p['room_type'] \
                    for p in dataset.groupBy("room_type").\
                        count().sort("count").toLocalIterator() \
                    if p['count'] > 50])
room_reduced

```

Out[19]:

```
{'Entire home/apt', 'Private room'}
```

In [20]:

```

room_reducer = SetReducer(room_reduced, "OTHER"). \
    setInputCol('room_type'). \
    setOutputCol('room_reduced')

room_reducer.transform(dataset). \
    groupBy("room_reduced"). \
    count(). \
    sort("count"). \
    show(999, truncate=False)
stages.append(room_reducer)

```

---

room_reduced	count
OTHER	9
Private room	486
Entire home/apt	1672

Once the strings have been reduced with the "OTHER" category, we can feed them into the Spark's indexer. The indexers will throw an error if they find an unseen string (which will not happen as anything unseen will be marked as "OTHER").

```
In [21]: n_indexer = StringIndexer(inputCol="neighbourhood_reduced", outputCol="neighbourhood_indexed")
fitted_n_indexer = n_indexer.fit(neighbourhood_reducer.transform(dataset))
stages.append(fitted_n_indexer)

p_indexer = StringIndexer(inputCol="property_reduced", outputCol="property_indexed")
fitted_p_indexer = p_indexer.fit(property_reducer.transform(dataset))
stages.append(fitted_p_indexer)

r_indexer = StringIndexer(inputCol="room_reduced", outputCol="room_indexed")
fitted_r_indexer = r_indexer.fit(room_reducer.transform(dataset))
stages.append(fitted_r_indexer)
```

```
In [22]: print(len(fitted_n_indexer.labels))
fitted_n_indexer.labels
```

14

```
Out[22]: ['Downtown',
'OTHER',
'Kitsilano',
'West End',
'Kensington-Cedar Cottage',
'Mount Pleasant',
'Downtown Eastside',
'Riley Park',
'Grandview-Woodland',
'Hastings-Sunrise',
'Fairview',
'Renfrew-Collingwood',
'Dunbar Southlands',
'Marpole']
```

```
In [23]: print(len(fitted_p_indexer.labels))
```

```
fitted_p_indexer.labels
```

8

```
Out[23]: ['Entire apartment',
          'Entire condominium',
          'Entire house',
          'Private room in house',
          'Entire guest suite',
          'OTHER',
          'Private room in apartment',
          'Entire loft']
```

```
In [24]: print(len(fitted_r_indexer.labels))
fitted_r_indexer.labels
```

3

```
Out[24]: ['Entire home/apt', 'Private room', 'OTHER']
```

We can instantiate a pipeline to see the transformed output.

```
In [25]: pipeline = Pipeline(stages=stages)
pipeline.fit(dataset).transform(dataset).show(vertical=True)
```

-RECORD 0-----	
id	13358
host_since	2009/11/07
host_location	Vancouver, Britis...
host_response_time	within a day
host_response_rate	0.71
host_acceptance_rate	0.71
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone'...]
host_has_profile_pic	f
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	West End
neighbourhood_group_cleansed	null
latitude	49.28209
longitude	-123.12515
property_type	Entire condominium
room_type	Entire home/apt
accommodates	2

bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven...
price	90
minimum_nights	30
maximum_nights	60
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	11
availability_60	41
availability_90	70
availability_365	70
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	West End
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	3.0
property_indexed	1.0
room_indexed	0.0
-RECORD 1-----	
id	16254
host_since	2009/12/15
host_location	Vancouver, Britis...
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Hastings-Sunrise
host_listings_count	1
host_total_listings_count	1
host_verifications	['phone', 'facebo...
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Hastings-Sunrise
neighbourhood_group_cleansed	null
latitude	49.27734
longitude	-123.04152

property_type	Entire guest suite
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven...
price	195
minimum_nights	3
maximum_nights	31
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	228
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Hastings-Sunrise
property_reduced	Entire guest suite
room_reduced	Entire home/apt
neighbourhood_indexed	9.0
property_indexed	4.0
room_indexed	0.0
-RECORD 2-----	
id	17765
host_since	2010/01/07
host_location	Vancouver, Britis...
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Mount Pleasant
host_listings_count	1
host_total_listings_count	1
host_verifications	['phone', 'facebo...
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Mount Pleasant

neighbourhood_group_cleansed	null
latitude	49.26181
longitude	-123.10905
property_type	Entire apartment
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Wifi...']
price	94
minimum_nights	3
maximum_nights	60
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Mount Pleasant
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	5.0
property_indexed	0.0
room_indexed	0.0
-RECORD 3-----	
id	18795
host_since	2010/01/13
host_location	Vancouver, Britis...
host_response_time	within a day
host_response_rate	0.7
host_acceptance_rate	0.4
host_is_superhost	f
host_neighbourhood	West End
host_listings_count	3
host_total_listings_count	3
host_verifications	['email', 'phone'...]
host_has_profile_pic	t

host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	West End
neighbourhood_group_cleansed	null
latitude	49.28251
longitude	-123.12827
property_type	Private room in h...
room_type	Private room
accommodates	2
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Cabl...
price	50
minimum_nights	30
maximum_nights	360
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	360
maximum_maximum_nights	360
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	360.0
has_availability	t
availability_30	9
availability_60	20
availability_90	50
availability_365	325
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	3
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	West End
property_reduced	Private room in h...
room_reduced	Private room
neighbourhood_indexed	3.0
property_indexed	3.0
room_indexed	1.0
-RECORD 4-----	
id	21913
host_since	2010/02/22
host_location	Vancouver, Britis...
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	t
host_neighbourhood	Renfrew-Collingwood
host_listings_count	3

host_total_listings_count	3
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Renfrew-Collingwood
neighbourhood_group_cleansed	null
latitude	49.23427
longitude	-123.05309
property_type	Entire house
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven...
price	80
minimum_nights	28
maximum_nights	400
minimum_minimum_nights	28
maximum_minimum_nights	28
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	28.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	2
availability_60	13
availability_90	43
availability_365	318
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Renfrew-Collingwood
property_reduced	Entire house
room_reduced	Entire home/apt
neighbourhood_indexed	11.0
property_indexed	2.0
room_indexed	0.0
-----	
-RECORD 5-----	
id	24273
host_since	2011/10/09
host_location	Vancouver, Britis...
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	0.82

host_is_superhost	f
host_neighbourhood	Kitsilano
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone'...]
host_has_profile_pic	f
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Kitsilano
neighbourhood_group_cleansed	null
latitude	49.2626
longitude	-123.17308
property_type	Entire apartment
room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven...
price	200
minimum_nights	30
maximum_nights	365
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	0
availability_90	10
availability_365	223
instant_bookable	f
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Kitsilano
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	2.0
property_indexed	0.0
room_indexed	0.0
-RECORD 6-----	
id	42645
host_since	2010/04/17
host_location	Vancouver, Britis...

host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	4
host_total_listings_count	4
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.28001
longitude	-123.12475
property_type	Entire condominium
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Oven...
price	159
minimum_nights	32
maximum_nights	365
minimum_minimum_nights	32
maximum_minimum_nights	32
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	32.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	29
availability_90	59
availability_365	333
instant_bookable	t
calculated_host_listings_count	4
calculated_host_listings_count_entire_homes	4
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	1.0
room_indexed	0.0

-RECORD 7-----

id	54261
host_since	2010/10/05
host_location	Vancouver, Britis...
host_response_time	a few days or more
host_response_rate	0
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Downtown Vancouver
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27655
longitude	-123.12485
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot ...
price	126
minimum_nights	90
maximum_nights	365
minimum_minimum_nights	90
maximum_minimum_nights	90
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	f
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	0.0

property_indexed	1.0
room_indexed	0.0
-RECORD 8-----	
id	72659
host_since	2011/02/03
host_location	Vancouver, Britis...
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Commercial Drive
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.27357
longitude	-123.07024
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	['Kitchen', 'Lake...']
price	210
minimum_nights	7
maximum_nights	21
minimum_minimum_nights	7
maximum_minimum_nights	7
minimum_maximum_nights	21
maximum_maximum_nights	21
minimum_nights_avg_ntm	7.0
maximum_nights_avg_ntm	21.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	40
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Grandview-Woodland

property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	8.0
property_indexed	1.0
room_indexed	0.0
-RECORD 9-----	
id	77157
host_since	2011/02/27
host_location	Vancouver, Britis...
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Arbutus Ridge
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Arbutus Ridge
neighbourhood_group_cleansed	null
latitude	49.24675
longitude	-123.16711
property_type	Private room in g...
room_type	Private room
accommodates	3
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Micr...']
price	75
minimum_nights	3
maximum_nights	60
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	3
availability_60	3
availability_90	3
availability_365	267
instant_bookable	t
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	0

calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	OTHER
property_reduced	OTHER
room_reduced	Private room
neighbourhood_indexed	1.0
property_indexed	5.0
room_indexed	1.0
-RECORD 10-----	
id	111077
host_since	2011/05/09
host_location	North Vancouver, ...
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0.33
host_is_superhost	f
host_neighbourhood	Grandview-Woodland
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.26726
longitude	-123.05969
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	['Kitchen', 'Indo...
price	125
minimum_nights	3
maximum_nights	365
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	4
availability_60	34
availability_90	64
availability_365	339

instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Grandview-Woodland
property_reduced	Entire guest suite
room_reduced	Entire home/apt
neighbourhood_indexed	8.0
property_indexed	4.0
room_indexed	0.0
-RECORD 11-----	
id	125176
host_since	2011/05/24
host_location	Vancouver, Britis...
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Riley Park
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Riley Park
neighbourhood_group_cleansed	null
latitude	49.24648
longitude	-123.09241
property_type	Private room in h...
room_type	Private room
accommodates	3
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	0
amenities	['Kitchen', 'Hot ...
price	75
minimum_nights	2
maximum_nights	60
minimum_minimum_nights	2
maximum_minimum_nights	2
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	2.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0

availability_60	0
availability_90	2
availability_365	268
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	1
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Riley Park
property_reduced	Private room in h...
room_reduced	Private room
neighbourhood_indexed	7.0
property_indexed	3.0
room_indexed	1.0
-RECORD 12-----	
id	129163
host_since	2011/05/17
host_location	Vancouver, Britis...
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Renfrew-Collingwood
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Renfrew-Collingwood
neighbourhood_group_cleansed	null
latitude	49.24507
longitude	-123.04941
property_type	Private room in h...
room_type	Private room
accommodates	1
bathrooms	null
bathrooms_text	1 shared bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot ...
price	45
minimum_nights	30
maximum_nights	280
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	280
maximum_maximum_nights	280
minimum_nights_avg_ntm	30.0

maximum_nights_avg_ntm	280.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	1
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Renfrew-Collingwood
property_reduced	Private room in h...
room_reduced	Private room
neighbourhood_indexed	11.0
property_indexed	3.0
room_indexed	1.0
-RECORD 13-----	
id	174135
host_since	2011/07/17
host_location	Vancouver, Britis...
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Downtown Eastside
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Downtown Eastside
neighbourhood_group_cleansed	null
latitude	49.27782
longitude	-123.08985
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Wifi...
price	100
minimum_nights	30
maximum_nights	365
minimum_minimum_nights	30
maximum_minimum_nights	30

minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	224
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown Eastside
property_reduced	Entire guest suite
room_reduced	Entire home/apt
neighbourhood_indexed	6.0
property_indexed	4.0
room_indexed	0.0
-RECORD 14-----	
id	200643
host_since	2011/08/16
host_location	Vancouver, Britis...
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Strathcona
host_listings_count	4
host_total_listings_count	4
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Downtown Eastside
neighbourhood_group_cleansed	null
latitude	49.27384
longitude	-123.08289
property_type	Private room in h...
room_type	Private room
accommodates	4
bathrooms	null
bathrooms_text	2 shared baths
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven...
price	87
minimum_nights	1

maximum_nights	1125
minimum_minimum_nights	1
maximum_minimum_nights	1
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	1.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	t
calculated_host_listings_count	4
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	4
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown Eastside
property_reduced	Private room in h...
room_reduced	Private room
neighbourhood_indexed	6.0
property_indexed	3.0
room_indexed	1.0
-RECORD 15-----	
id	248014
host_since	2011/10/16
host_location	Vancouver, Britis...
host_response_time	within a day
host_response_rate	0.5
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Grandview-Woodland
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.29103
longitude	-123.05782
property_type	Entire house
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	0

amenities	['Kitchen', 'Oven...
price	100
minimum_nights	31
maximum_nights	180
minimum_minimum_nights	31
maximum_minimum_nights	31
minimum_maximum_nights	180
maximum_maximum_nights	180
minimum_nights_avg_ntm	31.0
maximum_nights_avg_ntm	180.0
has_availability	t
availability_30	4
availability_60	4
availability_90	4
availability_365	113
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Grandview-Woodland
property_reduced	Entire house
room_reduced	Entire home/apt
neighbourhood_indexed	8.0
property_indexed	2.0
room_indexed	0.0
-RECORD 16-----	
id	258636
host_since	2011/08/09
host_location	Vancouver, Britis...
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27796
longitude	-123.12671
property_type	Entire apartment
room_type	Entire home/apt
accommodates	4
bathrooms	null

bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Iron...']
price	99
minimum_nights	120
maximum_nights	365
minimum_minimum_nights	120
maximum_minimum_nights	120
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	120.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	11
availability_90	41
availability_365	316
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	0.0
room_indexed	0.0
-RECORD 17-----	
id	283841
host_since	2009/08/10
host_location	Vancouver, Britis...
host_response_time	within a day
host_response_rate	0.93
host_acceptance_rate	0.88
host_is_superhost	f
host_neighbourhood	Coal Harbour
host_listings_count	49
host_total_listings_count	49
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.2872
longitude	-123.12352
property_type	Entire apartment

room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	3 baths
bedrooms	3
beds	3
amenities	['Kitchen', 'Hot ...
price	197
minimum_nights	90
maximum_nights	1125
minimum_minimum_nights	90
maximum_minimum_nights	90
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	41
calculated_host_listings_count_entire_homes	41
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	0.0
room_indexed	0.0
-RECORD 18-----	
id	323090
host_since	2012/01/01
host_location	Vancouver, Britis...
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0.85
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null

latitude	49.28206
longitude	-123.12461
property_type	Entire apartment
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Cook...
price	168
minimum_nights	180
maximum_nights	180
minimum_minimum_nights	180
maximum_minimum_nights	180
minimum_maximum_nights	180
maximum_maximum_nights	180
minimum_nights_avg_ntm	180.0
maximum_nights_avg_ntm	180.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	141
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	0.0
room_indexed	0.0
-RECORD 19-----	
id	359942
host_since	2011/09/23
host_location	Vancouver, Britis...
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Yaletown
host_listings_count	8
host_total_listings_count	8
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	f

neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27825
longitude	-123.11865
property_type	Private room in a...
room_type	Private room
accommodates	2
bathrooms	null
bathrooms_text	1 shared bath
bedrooms	2
beds	1
amenities	['Kitchen', 'Lake...
price	240
minimum_nights	30
maximum_nights	1125
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	29
availability_60	59
availability_90	89
availability_365	364
instant_bookable	f
calculated_host_listings_count	7
calculated_host_listings_count_entire_homes	3
calculated_host_listings_count_private_rooms	4
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Private room in a...
room_reduced	Private room
neighbourhood_indexed	0.0
property_indexed	6.0
room_indexed	1.0

only showing top 20 rows

## Set features: Amenities and Host Verifications

Once we have dealt with the categorical features, we can address the set-based columns. Let us take a look at them.

```
In [26]: dataset.select("amenities").show(truncate=False)
```

```
+-----+
|amenities
|+-----+
|+-----+
|[['Kitchen', 'Oven', 'Gym', 'Paid parking off premises', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Extra pillows and blankets', 'Dishwasher', 'Cooking basics', 'Hot water kettle', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning', 'Elevator']]
|[['Kitchen', 'Oven', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Hair dryer', 'Lockbox', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Children\u2019s books and toys', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack\u2019n Play/travel crib']]
|[['Kitchen', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Essentials', 'Washer', 'Long term stays allowed', 'Elevator']]
|['Kitchen', 'Cable TV', 'Wifi', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Long term stays allowed']
|[['Kitchen', 'Oven', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Luggage dropoff allowed', 'Private entrance', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Bed linens', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV']]
|[['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Fireplace guards', 'Carbon monoxide alarm', 'Stove', 'Crib', 'Hot water', 'Babysitter recommendations', 'Garden or backyard', 'Extra pillows and blankets', 'Dishwasher', 'Luggage dropoff allowed', 'Cooking basics', 'Room-darkening shades', 'Private entrance', 'Smoke alarm', 'Baking sheet', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bathtub', 'Coffee maker', 'Bed linens', 'Keypad', 'Shampoo', 'Fire extinguisher']]
```

her', 'Dishes and silverware', 'Shower gel', 'Patio or balcony', 'Children\u2019s books and toys', 'High chair', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib', 'TV', 'Ethernet connection']]  
|[['Kitchen', 'Oven', 'Paid parking on premises', 'Paid parking off premises', 'Gym', 'Microwave', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Luggage dropoff allowed', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Coffee maker', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Patio or balcony', 'Children\u2019s books and toys', 'High chair', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib', 'TV', 'Elevator']]  
|  
|[['Kitchen', 'Hot tub', 'Gym', 'Indoor fireplace', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free parking on premises', 'Shampoo', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning', 'Elevator']]  
|  
|[['Kitchen', 'Lake access', 'Oven', 'Paid parking off premises', 'Gym', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'BBQ grill', 'TV', 'Elevator']]  
|  
|[['Kitchen', 'Microwave', 'Wifi', 'Laundromat nearby', 'Dryer', 'Hot water', 'Garden or backyard', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Heating', 'Mini fridge', 'Single level home', 'Hair dryer', 'Lockbox', 'Dedicated workspace', 'First aid kit', 'Iron', 'Body soap', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Barbecue utensils', 'Shower gel', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Conditioner', 'BBQ grill', 'Beach essentials', 'TV', 'Long term stays allowed']]  
|  
|[['Kitchen', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Stove', 'Hot water', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Heating', 'Hair dryer', 'Iron', 'Free street parking', 'Coffee maker', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed']]  
|  
|[['Kitchen', 'Hot tub', 'Oven', 'Wifi', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Garden or backyard', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bathtub', 'Free parking on premises', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Patio or balcony', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Long term stays allowed', 'TV']]  
|  
|[['Kitchen', 'Hot water', 'Paid parking on premises', 'Lock on bedroom door', 'Free street parking', 'Cable TV', 'Smoke alarm', 'Wifi', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Carbon monoxide alarm', 'Dishes and silverware', 'TV', 'Long term stays allowed', 'Host greets you', 'Hair dryer', 'Shampoo', 'Fire extinguisher']]  
|  
|[['Kitchen', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Private entrance', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning']]  
|

We want to transform them into multiple columns reusing the machinery in MLLib for NLP. We first define an unary transformer that splits the string at the commas and removes quotes and brackets.

```
In [27]: class FieldSplitter(UnaryTransformer):
```

```

def createTransformFunc(self):
    def f(x):
        if x is None:
            return []
        l = x.split("'", "'")
        if len(l) > 1:
            l[0] = l[0][2:]
            l[-1] = l[-1][:-2]
        return l
    return f

def outputDataType(self):
    return ArrayType(StringType())

def validateInputType(self, inputType):
    assert inputType == StringType(), f'Expected StringType() and found {inputType}'

amenities_splitter = FieldSplitter(). \
    setInputCol('amenities'). \
    setOutputCol('amenities_array')

amenities_splitter.transform(dataset).show(vertical=True, truncate=False)
stages.append(amenities_splitter)

```

-RECORD 0-----	
id	13358
host_since	2009/11/07
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.71
host_acceptance_rate	0.71
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'offline_
government_id', 'selfie', 'government_id']	f
host_has_profile_pic	t
host_identity_verified	null
neighbourhood	

neighbourhood_cleansed	West End
neighbourhood_group_cleansed	null
latitude	49.28209
longitude	-123.12515
property_type	Entire condominium
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Gym', 'Paid parking off premises', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Extra pillows and blankets', 'Dishwasher', 'Cooking basics', 'Hot water kettle', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning', 'Elevator']
price	90
minimum_nights	30
maximum_nights	60
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	11
availability_60	41
availability_90	70
availability_365	70
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Oven, Gym, Paid parking off premises, Microwave, Wifi, Dryer, Carbon monoxide alarm, Stove, Hot water, Extra pillows and blankets, Dishwasher, Cooking basics, Hot water kettle, Smoke alarm, Heating, Single level home, Hair dryer, Dedicated workspace, Iron, Coffee maker, Bed linens, Shampoo, Dishes and silverware, Hangers, Cable TV, Refrigerator, Essentials, Washer, Long term stays allowed, TV, Air conditioning, Elevator]

-RECORD 1-----

---



---



---



---



---



---



---

id	16254
host_since	2009/12/15
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Hastings-Sunrise
host_listings_count	1
host_total_listings_count	1
host_verifications	['phone', 'facebook', 'offline_government_id', 'selfie', 'go
vernment_id', 'identity_manual']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Hastings-Sunrise
neighbourhood_group_cleansed	null
latitude	49.27734
longitude	-123.04152
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Hair dryer', 'Lockbox', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Children\u2019s books and toys', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib']
price	195
minimum_nights	3
maximum_nights	31
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	228
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1



minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Wifi, Host greets you, Dryer, Carbon monoxide alarm, Hot water, Luggage dropoff allowed, Smoke alarm, Heating, Hair dryer, Dedicated workspace, Iron, Free street parking, Free parking on premises, Coffee maker, Shampoo, Dishes and silverware, Fire extinguisher, Hangars, Essentials, Washer, Long term stays allowed, Elevator]

id	18795
host_since	2010/01/13
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.7
host_acceptance_rate	0.4
host_is_superhost	f
host_neighbourhood	West End
host_listings_count	3
host_total_listings_count	3
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	West End
neighbourhood_group_cleansed	null
latitude	49.28251
longitude	-123.12827
property_type	Private room in house
room_type	Private room
accommodates	2

bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Cable TV', 'Wifi', 'Essentials', 'Heating', 'Wa
sher', 'Dryer', 'Long term stays allowed']	
price	50
minimum_nights	30
maximum_nights	360
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	360
maximum_maximum_nights	360
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	360.0
has_availability	t
availability_30	9
availability_60	20
availability_90	50
availability_365	325
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	3
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Cable TV, Wifi, Essentials, Heating, Washer, Drye
r, Long term stays allowed]	

-RECORD 4-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

id	21913
host_since	2010/02/22
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	t
host_neighbourhood	Renfrew-Collingwood
host_listings_count	3
host_total_listings_count	3
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'self
ie', 'government_id']	
host_has_profile_pic	t
host_identity_verified	t

neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Renfrew-Collingwood
neighbourhood_group_cleansed	null
latitude	49.23427
longitude	-123.05309
property_type	Entire house
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Luggage dropoff allowed', 'Private entrance', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Bed linens', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV']
price	80
minimum_nights	28
maximum_nights	400
minimum_minimum_nights	28
maximum_minimum_nights	28
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	28.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	2
availability_60	13
availability_90	43
availability_365	318
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Oven, Microwave, Wifi, Dryer, Carbon monoxide alarm, Stove, Hot water, Luggage dropoff allowed, Private entrance, Smoke alarm, Heating, Single level home, Hair dryer, Dedicated workspace, Iron, Free street parking, Free parking on premises, Coffee maker, Bed linens, Keypad, Shampoo, Dishes and silverware, Fire extinguisher, Hangers, Cable TV, Refrigerator, Essentials, Washer, Long term stays allowed, TV]

-RECORD 5-----

-----

-----

-----

-----

-----

id	24273
host_since	2011/10/09
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	0.82
host_is_superhost	f
host_neighbourhood	Kitsilano
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'jumio', 'offline_government_id', 'government_id']
host_has_profile_pic	f
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Kitsilano
neighbourhood_group_cleansed	null
latitude	49.2626
longitude	-123.17308
property_type	Entire apartment
room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Fireplace guards', 'Carbon monoxide alarm', 'Stove', 'Crib', 'Hot water', 'Babysitter recommendations', 'Garden or backyard', 'Extra pillows and blankets', 'Dishwasher', 'Luggage dropoff allowed', 'Cooking basics', 'Room-darkening shades', 'Private entrance', 'Smoke alarm', 'Baking sheet', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bathtub', 'Coffee maker', 'Bed linens', 'Keypad', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Shower gel', 'Patio or balcony', 'Children\u2019s books and toys', 'High chair', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib', 'TV', 'Ethernet connection']
price	200
minimum_nights	30
maximum_nights	365
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	0
availability_90	10
availability_365	223
instant_bookable	f

calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Oven, Indoor fireplace, Microwave, Wifi, Dryer, Fire guard, Carbon monoxide alarm, Stove, Crib, Hot water, Babysitter recommendations, Garden or backyard, Extra pillows and blankets, Dishwasher, Luggage dropoff allowed, Cooking basics, Room-darkening shades, Private entrance, Smoke alarm, Baking sheet, Heating, Single level home, Hair dryer, Dedicated workspace, Iron, Free street parking, Bathtub, Coffee maker, Bed linens, Keypad, Shampoo, Fire extinguisher, Dishes and silverware, Shower gel, Patio or balcony, Children's books and toys, High chair, Hangers, Cable TV, Refrigerator, Essentials, Washer, Long term stays allowed, Pack n Play/travel crib, TV, Ethernet connection]
-RECORD 6-----	
-----	
-----	
-----	
-----	
id	42645
host_since	2010/04/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	4
host_total_listings_count	4
host_verifications	['email', 'phone', 'facebook', 'reviews']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.28001
longitude	-123.12475
property_type	Entire condominium
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Oven', 'Paid parking on premises', 'Paid parking off premises', 'Gym', 'Microwave', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Luggage dropoff allowed', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Coffee maker', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Shower gel', 'Patio or balcony', 'Children's books and toys', 'High chair', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack n Play/travel crib', 'TV', 'Ethernet connection']

'and silverware', 'Patio or balcony', 'Children\u2019s books and toys', 'High chair', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib', 'TV', 'Elevator']	
price	159
minimum_nights	32
maximum_nights	365
minimum_minimum_nights	32
maximum_minimum_nights	32
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	32.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	29
availability_90	59
availability_365	333
instant_bookable	t
calculated_host_listings_count	4
calculated_host_listings_count_entire_homes	4
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Oven, Paid parking on premises, Paid parking off premises, Gym, Microwave, Wifi, Host greets you, Dryer, Carbon monoxide alarm, Stove, Hot water, Dishwasher, Luggage dropoff allowed, Cooking basics, Smoke alarm, Heating, Hair dryer, Dedicated workspace, First aid kit, Iron, Coffee maker, Shampoo, Fire extinguisher, Dishes and silverware, Patio or balcony, Children\u2019s books and toys, High chair, Hangers, Cable TV, Refrigerator, Essentials, Washer, Long term stays allowed, Pack \u2019n Play/travel crib, TV, Elevator]

id	54261
host_since	2010/10/05
host_location	Vancouver, British Columbia, Canada
host_response_time	a few days or more
host_response_rate	0
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Downtown Vancouver
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'selfie', 'government_id', 'identity_manual']
host_has_profile_pic	t

host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27655
longitude	-123.12485
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot tub', 'Gym', 'Indoor fireplace', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free parking on premises', 'Shampoo', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning', 'Elevator']
price	126
minimum_nights	90
maximum_nights	365
minimum_minimum_nights	90
maximum_minimum_nights	90
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	f
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Hot tub, Gym, Indoor fireplace, Wifi, Host greets you, Dryer, Carbon monoxide alarm, Hot water, Luggage dropoff allowed, Smoke alarm, Heating, Hair dryer, Dedicated workspace, Iron, Free parking on premises, Shampoo, Fire extinguisher, Hangers, Cable TV, Essentials, Washer, Long term stays allowed, TV, Air conditioning, Elevator]

-RECORD 8-----

-----

-----

-----

-----

-----

id	72659
host_since	2011/02/03
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Commercial Drive
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.27357
longitude	-123.07024
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	['Kitchen', 'Lake access', 'Oven', 'Paid parking off premises', 'Gym', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'BBQ grill', 'TV', 'Elevator']
price	210
minimum_nights	7
maximum_nights	21
minimum_minimum_nights	7
maximum_minimum_nights	7
minimum_maximum_nights	21
maximum_maximum_nights	21
minimum_nights_avg_ntm	7.0
maximum_nights_avg_ntm	21.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	40
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0

calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Lake access, Oven, Paid parking off premises, Gym, Indoor fireplace, Microwave, Wifi, Dryer, Carbon monoxide alarm, Stove, Hot water, Dishwasher, Extra pillows and blankets, Luggage dropoff allowed, Cooking basics, Smoke alarm, Heating, Single level home, Hair dryer, Dedicated workspace, Iron, Free street parking, Coffee maker, Bed linens, Shampoo, Dishes and silverware, Fire extinguisher, Patio or balcony, Hangers, Refrigerator, Essentials, Washer, BBQ grill, TV, Elevator]
-RECORD 9-----	
-----	
-----	
-----	

id	77157
host_since	2011/02/27
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Arbutus Ridge
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'offline_government_id', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Arbutus Ridge
neighbourhood_group_cleansed	null
latitude	49.24675
longitude	-123.16711
property_type	Private room in guest suite
room_type	Private room
accommodates	3
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Microwave', 'Wifi', 'Laundromat nearby', 'Dryer', 'Hot water', 'Garden or backyard', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Heating', 'Mini fridge', 'Single level home', 'Hair dryer', 'Lockbox', 'Dedicated workspace', 'First aid kit', 'Iron', 'Body soap', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Barbecue utensils', 'Shower gel', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Conditioner', 'BBQ grill', 'Beach essentials', 'TV', 'Long term stays allowed']
price	75
minimum_nights	3

maximum_nights	60
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	3
availability_60	3
availability_90	3
availability_365	267
instant_bookable	t
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Microwave, Wifi, Laundromat nearby, Dryer, Hot water, Garden or backyard, Extra pillows and blankets, Luggage dropoff allowed, Cooking basics, Private entrance, Smoke alarm, Heating, Mini fridge, Single level home, Hair dryer, Lockbox, Dedicated workspace, First aid kit, Iron, Body soap, Free street parking, Coffee maker, Bed linens, Shampoo, Fire extinguisher, Dishes and silverware, Barbecue utensils, Shower gel, Hangers, Cable TV, Essentials, Washer, Conditioner, BBQ grill, Beach essentials, TV, Long term stays allowed]

-RECORD 10

id	111077
host_since	2011/05/09
host_location	North Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0.33
host_is_superhost	f
host_neighbourhood	Grandview-Woodland
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'governme nt_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.26726

longitude	-123.05969
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	['Kitchen', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Stove', 'Hot water', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Heating', 'Hair dryer', 'Iron', 'Free street parking', 'Coffee maker', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed']
price	125
minimum_nights	3
maximum_nights	365
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	4
availability_60	34
availability_90	64
availability_365	339
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Indoor fireplace, Microwave, Wifi, Dryer, Stove, Hot water, Cooking basics, Private entrance, Smoke alarm, Heating, Hair dryer, Iron, Free street parking, Coffee maker, Keypad, Shampoo, Dishes and silverware, Fire extinguisher, Hangers, Refrigerator, Essentials, Washer, Long term stays allowed]

id	125176
host_since	2011/05/24
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1

host_is_superhost	f
host_neighbourhood	Riley Park
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'offline_governmen
t_id', 'government_id', 'work_email']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Riley Park
neighbourhood_group_cleansed	null
latitude	49.24648
longitude	-123.09241
property_type	Private room in house
room_type	Private room
accommodates	3
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	0
amenities	['Kitchen', 'Hot tub', 'Oven', 'Wifi', 'Carbon monoxide alar
m', 'Stove', 'Hot water', 'Garden or backyard', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bathtub', 'Free parking on premises', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Patio or balcony', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Long term stays allowed', 'TV']	
price	75
minimum_nights	2
maximum_nights	60
minimum_minimum_nights	2
maximum_minimum_nights	2
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	2.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	2
availability_365	268
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	1
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Hot tub, Oven, Wifi, Carbon monoxide alarm, Stove,
Hot water, Garden or backyard, Cooking basics, Smoke alarm, Heating, Hair dryer, Dedicated workspace, Iron,	
Free street parking, Bathtub, Free parking on premises, Keypad, Shampoo, Dishes and silverware, Patio or balcony, Hangers, Cable TV, Refrigerator, Essentials, Long term stays allowed, TV]	

-RECORD 12-----

id	129163
host_since	2011/05/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Renfrew-Collingwood
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'jumio', 'offline_government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Renfrew-Collingwood
neighbourhood_group_cleansed	null
latitude	49.24507
longitude	-123.04941
property_type	Private room in house
room_type	Private room
accommodates	1
bathrooms	null
bathrooms_text	1 shared bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot water', 'Paid parking on premises', 'Lock on bedroom door', 'Free street parking', 'Cable TV', 'Smoke alarm', 'Wifi', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Carbon monoxide alarm', 'Dishes and silverware', 'TV', 'Long term stays allowed', 'Host greets you', 'Hair dryer', 'Shampoo', 'Fire extinguisher']
price	45
minimum_nights	30
maximum_nights	280
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	280
maximum_maximum_nights	280
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	280.0
has_availability	t
availability_30	30
availability_60	60

availability_90	90
availability_365	365
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	1
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Hot water, Paid parking on premises, Lock on bedroom door, Free street parking, Cable TV, Smoke alarm, Wifi, Essentials, Heating, Washer, Dryer, Carbon monoxide alarm, Dishes and silverware, TV, Long term stays allowed, Host greets you, Hair dryer, Shampoo, Fire extinguisher]
-RECORD 13-	-----
id	174135
host_since	2011/07/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Downtown Eastside
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'selfie', 'government_id', 'identity_manual']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown Eastside
neighbourhood_group_cleansed	null
latitude	49.27782
longitude	-123.08985
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Private entrance', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning']

price	100
minimum_nights	30
maximum_nights	365
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	224
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Wifi, Dryer, Carbon monoxide alarm, Hot water, Lug gage dropoff allowed, Private entrance, Smoke alarm, Heating, Hair dryer, Dedicated workspace, Iron, Free street parking, Bed linens, Shampoo, Fire extinguisher, Hangers, Cable TV, Essentials, Washer, Long term stays allowed, TV, Air conditioning]
-RECORD 14-----	

- RECORD 14

<code>id</code>	200643
<code>host_since</code>	2011/08/16
<code>host_location</code>	Vancouver, British Columbia, Canada
<code>host_response_time</code>	within an hour
<code>host_response_rate</code>	1
<code>host_acceptance_rate</code>	1
<code>host_is_superhost</code>	f
<code>host_neighbourhood</code>	Strathcona
<code>host_listings_count</code>	4
<code>host_total_listings_count</code>	4
<code>host_verifications</code>	['email', 'phone', 'reviews', 'jumio', 'government_id']
<code>host_has_profile_pic</code>	t
<code>host_identity_verified</code>	t
<code>neighbourhood</code>	Vancouver, British Columbia, Canada
<code>neighbourhood_cleansed</code>	Downtown Eastside
<code>neighbourhood_group_cleansed</code>	null
<code>latitude</code>	49.27384
<code>longitude</code>	-123.08289

property_type	Private room in house
room_type	Private room
accommodates	4
bathrooms	null
bathrooms_text	2 shared baths
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Garden or backyard', 'Dishwasher', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Room-darkening shades', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib']
price	87
minimum_nights	1
maximum_nights	1125
minimum_minimum_nights	1
maximum_minimum_nights	1
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	1.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	t
calculated_host_listings_count	4
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	4
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Oven, Indoor fireplace, Microwave, Wifi, Dryer, Carbon monoxide alarm, Stove, Hot water, Garden or backyard, Dishwasher, Extra pillows and blankets, Luggage dropoff allowed, Cooking basics, Room-darkening shades, Smoke alarm, Heating, Hair dryer, Dedicated workspace, First aid kit, Iron, Free street parking, Coffee maker, Bed linens, Shampoo, Fire extinguisher, Dishes and silverware, Hangers, Refrigerator, Essentials, Washer, Long term stays allowed, Pack \u2019n Play/travel crib]

-RECORD 15-

<b>id</b>	248014
<b>host_since</b>	2011/10/16
<b>host_location</b>	Vancouver, British Columbia, Canada

host_response_time	within a day
host_response_rate	0.5
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Grandview-Woodland
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.29103
longitude	-123.05782
property_type	Entire house
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	0
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wifi', 'Host greets you', 'Dryer', 'Stove', 'Carbon monoxide alarm', 'Hot water', 'Garden or backyard', 'Dishwasher', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Free street parking', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Cable TV', 'Refrigerator', 'Hangers', 'Essentials', 'Washer', 'Long term stays allowed', 'BBQ grill', 'TV', 'Cleaning before checkout']
price	100
minimum_nights	31
maximum_nights	180
minimum_minimum_nights	31
maximum_minimum_nights	31
minimum_maximum_nights	180
maximum_maximum_nights	180
minimum_nights_avg_ntm	31.0
maximum_nights_avg_ntm	180.0
has_availability	t
availability_30	4
availability_60	4
availability_90	4
availability_365	113
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Oven, Indoor fireplace, Microwave, Wifi, Host greets you, Dryer, Stove, Carbon monoxide alarm, Hot water, Garden or backyard, Dishwasher, Cooking basics, Smok

e alarm, Heating, Hair dryer, Dedicated workspace, First aid kit, Iron, Free street parking, Dishes and silverware, Fire extinguisher, Patio or balcony, Cable TV, Refrigerator, Hangers, Essentials, Washer, Long term stays allowed, BBQ grill, TV, Cleaning before checkout]

-RECORD 16-

id	258636
host_since	2011/08/09
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27796
longitude	-123.12671
property_type	Entire apartment
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Iron', 'Elevator', 'Gym', 'Hangers', 'Smoke ala rm', 'Wifi', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Free parking on premises', 'Long term stays allowe d', 'Hair dryer', 'Shampoo', 'Dedicated workspace']
price	99
minimum_nights	120
maximum_nights	365
minimum_minimum_nights	120
maximum_minimum_nights	120
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	120.0
maximum_nights_avg_ntm	365.0
has_availability	t

availability_30	0
availability_60	11
availability_90	41
availability_365	316
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Iron, Elevator, Gym, Hangers, Smoke alarm, Wifi, Essentials, Heating, Washer, Dryer, Free parking on premises, Long term stays allowed, Hair dryer, Shampoo, Dedicated workspace]
-RECORD 17-----	
-----	
-----	
-----	
-----	
-----	
id	283841
host_since	2009/08/10
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.93
host_acceptance_rate	0.88
host_is_superhost	f
host_neighbourhood	Coal Harbour
host_listings_count	49
host_total_listings_count	49
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.2872
longitude	-123.12352
property_type	Entire apartment
room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	3 baths
bedrooms	3
beds	3
amenities	['Kitchen', 'Hot tub', 'Oven', 'Pool', 'Gym', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free parking on premises', 'Coffee maker', 'Dishes and silverware', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowe

d', 'TV', 'Air conditioning']	
price	197
minimum_nights	90
maximum_nights	1125
minimum_minimum_nights	90
maximum_minimum_nights	90
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	41
calculated_host_listings_count_entire_homes	41
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Hot tub, Oven, Pool, Gym, Indoor fireplace, Microwave, Wifi, Dryer, Carbon monoxide alarm, Stove, Hot water, Dishwasher, Smoke alarm, Heating, Hair dryer, Dedicated workspace, Iron, Free parking on premises, Coffee maker, Dishes and silverware, Hangers, Cable TV, Refrigerator, Essentials, Washer, Long term stays allowed, TV, Air conditioning]

-RECORD 18-----

-----

-----

-----

-----

id	323090
host_since	2012/01/01
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0.85
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.28206

longitude	-123.12461
property_type	Entire apartment
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Cooking basics', 'Iron', 'Elevator', 'Gym', 'Hangers', 'Cable TV', 'Smoke alarm', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Carbon monoxide alarm', 'Wifi', 'TV', 'Long term stays allowed', 'Hair dryer', 'Shampoo', 'Dishes and silverware', 'Dedicated workspace']

price	168
minimum_nights	180
maximum_nights	180
minimum_minimum_nights	180
maximum_minimum_nights	180
minimum_maximum_nights	180
maximum_maximum_nights	180
minimum_nights_avg_ntm	180.0
maximum_nights_avg_ntm	180.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	141
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
amenities_array	['Kitchen', 'Cooking basics', 'Iron', 'Elevator', 'Gym', 'Hangers', 'Cable TV', 'Smoke alarm', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Carbon monoxide alarm', 'Wifi', 'TV', 'Long term stays allowed', 'Hair dryer', 'Shampoo', 'Dishes and silverware', 'Dedicated workspace']

-RECORD 19-----

-----

-----

-----

-----

-----

-----

-----

id	359942
host_since	2011/09/23
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	N/A
host_is_superhost	f

host_neighbourhood	Yaletown
host_listings_count	8
host_total_listings_count	8
host_verifications	['email', 'phone', 'facebook', 'reviews']
host_has_profile_pic	t
host_identity_verified	f
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27825
longitude	-123.11865
property_type	Private room in apartment
room_type	Private room
accommodates	2
bathrooms	null
bathrooms_text	1 shared bath
bedrooms	2
beds	1
amenities	['Kitchen', 'Lake access', 'Oven', 'Paid parking on premises', 'Paid parking off premises', 'Gym', 'Microwave', 'Wifi', 'Dryer', 'Stove', 'Hot water', 'Dishwasher', 'Extra pillows and blankets', 'Cooking basics', 'Heating', 'Lock on bedroom door', 'Hair dryer', 'Iron', 'Coffee maker', 'Bed linens', 'Pocket wifi', 'Shampoo', 'Dishes and silverware', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Elevator']
price	240
minimum_nights	30
maximum_nights	1125
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	29
availability_60	59
availability_90	89
availability_365	364
instant_bookable	f
calculated_host_listings_count	7
calculated_host_listings_count_entire_homes	3
calculated_host_listings_count_private_rooms	4
calculated_host_listings_count_shared_rooms	0
amenities_array	[Kitchen, Lake access, Oven, Paid parking on premises, Paid parking off premises, Gym, Microwave, Wifi, Dryer, Stove, Hot water, Dishwasher, Extra pillows and blankets, Cooking basics, Heating, Lock on bedroom door, Hair dryer, Iron, Coffee maker, Bed linens, Pocket wifi, Shampoo, Dishes and silverware, Hangers, Refrigerator, Essentials, Washer, Long term stays allowed, Elevator]

only showing top 20 rows



In [28]:

```
verifications_splitter = FieldSplitter(). \  
    setInputCol('host_verifications'). \  
    setOutputCol('verifications_array')  
  
verifications_splitter.transform(dataset).show(vertical=True, truncate=False)  
stages.append(verifications_splitter)
```

-RECORD 0-----

id	13358
host_since	2009/11/07
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.71
host_acceptance_rate	0.71
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'offline_government_id', 'selfie', 'government_id']
host_has_profile_pic	f
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	West End
neighbourhood_group_cleansed	null
latitude	49.28209
longitude	-123.12515
property_type	Entire condominium
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Gym', 'Paid parking off premises', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Extra pillows and blankets', 'Dish washer', 'Cooking basics', 'Hot water kettle', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning', 'Elevator']

price	90
minimum_nights	30
maximum_nights	60
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	11
availability_60	41
availability_90	70
availability_365	70
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
verifications_array	[email, phone, facebook, reviews, jumio, offline_government_id, selfie, government_id]

**RECORD 1**

id	16254
host_since	2009/12/15
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Hastings-Sunrise
host_listings_count	1
host_total_listings_count	1
host_verifications	['phone', 'facebook', 'offline_government_id', 'selfie', 'go
vernment_id', 'identity_manual']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Hastings-Sunrise
neighbourhood_group_cleansed	null
latitude	49.27734
longitude	-123.04152
property type	Entire guest suite

room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basic skills', 'Private entrance', 'Smoke alarm', 'Hair dryer', 'Lockbox', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Children\u2019s books and toys', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib']
price	195
minimum_nights	3
maximum_nights	31
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	228
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
verifications_array	[phone, facebook, offline_government_id, selfie, government_id, identity_manual]
-RECORD 2-----	
id	17765
host_since	2010/01/07
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Mount Pleasant

host_listings_count	1
host_total_listings_count	1
host_verifications	['phone', 'facebook', 'reviews', 'jumio', 'offline_governmen
t_id', 'selfie', 'government_id']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Mount Pleasant
neighbourhood_group_cleansed	null
latitude	49.26181
longitude	-123.10905
property_type	Entire apartment
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Wifi', 'Host greets you', 'Dryer', 'Carbon mono xide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated work space', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Shampoo', 'Dishes and si lverware', 'Fire extinguisher', 'Hangers', 'Essentials', 'Washer', 'Long term stays allowed', 'Elevator']
price	94
minimum_nights	3
maximum_nights	60
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
verifications_array	[phone, facebook, reviews, jumio, offline_government_id, sel fie, government_id]

-RECORD 3-----  
-----  
-----  
-----  
-----

id	18795
host_since	2010/01/13
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.7
host_acceptance_rate	0.4
host_is_superhost	f
host_neighbourhood	West End
host_listings_count	3
host_total_listings_count	3
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	West End
neighbourhood_group_cleansed	null
latitude	49.28251
longitude	-123.12827
property_type	Private room in house
room_type	Private room
accommodates	2
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Cable TV', 'Wifi', 'Essentials', 'Heating', 'Wa
sher', 'Dryer', 'Long term stays allowed']	
price	50
minimum_nights	30
maximum_nights	360
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	360
maximum_maximum_nights	360
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	360.0
has_availability	t
availability_30	9
availability_60	20
availability_90	50
availability_365	325
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	3
calculated_host_listings_count_shared_rooms	0
verifications_array	[email, phone, reviews, jumio, government_id]

-RECORD 4-----

id	21913
host_since	2010/02/22
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	t
host_neighbourhood	Renfrew-Collingwood
host_listings_count	3
host_total_listings_count	3
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'selfie', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Renfrew-Collingwood
neighbourhood_group_cleansed	null
latitude	49.23427
longitude	-123.05309
property_type	Entire house
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Luggage dropoff allowed', 'Private entrance', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Bed linens', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV']
price	80
minimum_nights	28
maximum_nights	400
minimum_minimum_nights	28
maximum_minimum_nights	28
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	28.0
maximum_nights_avg_ntm	1125.0
has_availability	t

availability_30	2
availability_60	13
availability_90	43
availability_365	318
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0
verifications_array	[email, phone, reviews, offline_government_id, selfie, government_id]
-RECORD 5-----	
-----	
-----	
-----	
-----	
id	24273
host_since	2011/10/09
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	0.82
host_is_superhost	f
host_neighbourhood	Kitsilano
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'jumio', 'offline_government_id', 'government_id']
host_has_profile_pic	f
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Kitsilano
neighbourhood_group_cleansed	null
latitude	49.2626
longitude	-123.17308
property_type	Entire apartment
room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Fireplace guards', 'Carbon monoxide alarm', 'Stove', 'Crib', 'Hot water', 'Babysitter recommendations', 'Garden or backyard', 'Extra pillows and blankets', 'Dishwasher', 'Luggage dropoff allowed', 'Cooking basics', 'Room-darkening shades', 'Private entrance', 'Smoke alarm', 'Baking sheet', 'Heating', 'Single lev

```

el home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bathtub', 'Coffee maker', 'Be
d linens', 'Keypad', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Shower gel', 'Patio or balcon
y', 'Children\u2019s books and toys', 'High chair', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Wa
sher', 'Long term stays allowed', 'Pack \u2019n Play/travel crib', 'TV', 'Ethernet connection']
    price                                | 200
    minimum_nights                         | 30
    maximum_nights                          | 365
    minimum_minimum_nights                 | 30
    maximum_minimum_nights                 | 30
    minimum_maximum_nights                 | 365
    maximum_maximum_nights                 | 365
    minimum_nights_avg_ntm                | 30.0
    maximum_nights_avg_ntm                | 365.0
    has_availability                       | t
    availability_30                        | 0
    availability_60                        | 0
    availability_90                        | 10
    availability_365                       | 223
    instant_bookable                       | f
    calculated_host_listings_count         | 2
    calculated_host_listings_count_entire_homes | 2
    calculated_host_listings_count_private_rooms | 0
    calculated_host_listings_count_shared_rooms | 0
    verifications_array                   | [email, phone, reviews, jumio, offline_government_id, govern
ment_id]
-RECORD 6-----
-----
```

```

-----
```

id	42645
host_since	2010/04/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	4
host_total_listings_count	4
host_verifications	['email', 'phone', 'facebook', 'reviews']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null

latitude	49.28001
longitude	-123.12475
property_type	Entire condominium
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Oven', 'Paid parking on premises', 'Paid parking off premises', 'Gym', 'Microwave', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Luggage dropoff allowed', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Coffee maker', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Patio or balcony', 'Children\u2019s books and toys', 'High chair', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib', 'TV', 'Elevator']
price	159
minimum_nights	32
maximum_nights	365
minimum_minimum_nights	32
maximum_minimum_nights	32
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	32.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	29
availability_90	59
availability_365	333
instant_bookable	t
calculated_host_listings_count	4
calculated_host_listings_count_entire_homes	4
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
verifications_array	[email, phone, facebook, reviews]

-RECORD 7-

<code>id</code>	54261
<code>host_since</code>	2010/10/05
<code>host_location</code>	Vancouver, British Columbia, Canada
<code>host_response_time</code>	a few days or more
<code>host_response_rate</code>	0

host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Downtown Vancouver
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'selfie', 'government_id', 'identity_manual']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27655
longitude	-123.12485
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot tub', 'Gym', 'Indoor fireplace', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free parking on premises', 'Shampoo', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning', 'Elevator']
price	126
minimum_nights	90
maximum_nights	365
minimum_minimum_nights	90
maximum_minimum_nights	90
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	f
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
verifications_array	[email, phone, reviews, offline_government_id, selfie, government_id, identity_manual]

-RECORD 8-----

id	72659
host_since	2011/02/03
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Commercial Drive
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.27357
longitude	-123.07024
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	['Kitchen', 'Lake access', 'Oven', 'Paid parking off premise', 'Gym', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'BBQ grill', 'TV', 'Elevator']
price	210
minimum_nights	7
maximum_nights	21
minimum_minimum_nights	7
maximum_minimum_nights	7
minimum_maximum_nights	21
maximum_maximum_nights	21
minimum_nights_avg_ntm	7.0
maximum_nights_avg_ntm	21.0
has_availability	t
availability_30	0
availability_60	0

availability_90	0
availability_365	40
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
verifications_array	[email, phone, reviews, jumio, government_id]
-RECORD 9-----	
-----	
-----	
-----	
-----	
id	77157
host_since	2011/02/27
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Arbutus Ridge
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'offline_government_id', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Arbutus Ridge
neighbourhood_group_cleansed	null
latitude	49.24675
longitude	-123.16711
property_type	Private room in guest suite
room_type	Private room
accommodates	3
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Microwave', 'Wifi', 'Laundromat nearby', 'Dryer', 'Hot water', 'Garden or backyard', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Heating', 'Mini fridge', 'Single level home', 'Hair dryer', 'Lockbox', 'Dedicated workspace', 'First aid kit', 'Iron', 'Body soap', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Barbecue utensils', 'Shower gel', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Conditioner', 'BBQ grill', 'Beach essentials', 'TV', 'Long term stays allowed']

price	75
minimum_nights	3
maximum_nights	60
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	3
availability_60	3
availability_90	3
availability_365	267
instant_bookable	t
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0
verifications_array	[email, phone, facebook, reviews, jumio, offline_government_id, government_id]
-RFCORD 10-----	

id	111077
host_since	2011/05/09
host_location	North Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0.33
host_is_superhost	f
host_neighbourhood	Grandview-Woodland
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'governme
nt_id']	n
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.26726
longitude	-123.05969
property_type	Entire guest suite

room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	['Kitchen', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Stove', 'Hot water', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Heating', 'Hair dryer', 'Iron', 'Free street parking', 'Coffee maker', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed']
price	125
minimum_nights	3
maximum_nights	365
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	4
availability_60	34
availability_90	64
availability_365	339
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
verifications_array	[email, phone, facebook, reviews, jumio, government_id]

-RECORD 11-----

id	125176
host_since	2011/05/24
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Riley Park
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'offline_governmen

t_id', 'government_id', 'work_email']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Riley Park
neighbourhood_group_cleansed	null
latitude	49.24648
longitude	-123.09241
property_type	Private room in house
room_type	Private room
accommodates	3
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	0
amenities	['Kitchen', 'Hot tub', 'Oven', 'Wifi', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Garden or backyard', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bathtub', 'Free parking on premises', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Patio or balcony', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Long term stays allowed', 'TV']
price	75
minimum_nights	2
maximum_nights	60
minimum_minimum_nights	2
maximum_minimum_nights	2
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	2.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	2
availability_365	268
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	1
calculated_host_listings_count_shared_rooms	0
verifications_array	[email, phone, facebook, reviews, offline_government_id, government_id, work_email]

-RECORD 12-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----

id	129163
host_since	2011/05/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Renfrew-Collingwood
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'jumio', 'offline_government_id', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Renfrew-Collingwood
neighbourhood_group_cleansed	null
latitude	49.24507
longitude	-123.04941
property_type	Private room in house
room_type	Private room
accommodates	1
bathrooms	null
bathrooms_text	1 shared bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot water', 'Paid parking on premises', 'Lock on bedroom door', 'Free street parking', 'Cable TV', 'Smoke alarm', 'Wifi', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Carbon monoxide alarm', 'Dishes and silverware', 'TV', 'Long term stays allowed', 'Host greets you', 'Hair dryer', 'Shampoo', 'Fire extinguisher']
price	45
minimum_nights	30
maximum_nights	280
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	280
maximum_maximum_nights	280
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	280.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	1
calculated_host_listings_count_shared_rooms	0

verifications_array	[email, phone, reviews, jumio, offline_government_id, government_id]
-RECORD 13-----	-----
-----	-----
-----	-----
-----	-----
id	174135
host_since	2011/07/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Downtown Eastside
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'self ie', 'government_id', 'identity_manual']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown Eastside
neighbourhood_group_cleansed	null
latitude	49.27782
longitude	-123.08985
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Private entrance', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning']
price	100
minimum_nights	30
maximum_nights	365
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	365.0

has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	224
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
verifications_array	[email, phone, reviews, offline_government_id, selfie, government_id, identity_manual]
-RECORD 14-----	
-----	
-----	
-----	
-----	
-----	
id	200643
host_since	2011/08/16
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Strathcona
host_listings_count	4
host_total_listings_count	4
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown Eastside
neighbourhood_group_cleansed	null
latitude	49.27384
longitude	-123.08289
property_type	Private room in house
room_type	Private room
accommodates	4
bathrooms	null
bathrooms_text	2 shared baths
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Garden or backyard', 'Dishwasher', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Room-darkening shades', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Free street parking', 'Coffee maker', 'Be

```

d linens', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Hangers', 'Refrigerator', 'Essentials',
'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib']
price | 87
minimum_nights | 1
maximum_nights | 1125
minimum_minimum_nights | 1
maximum_minimum_nights | 1
minimum_maximum_nights | 1125
maximum_maximum_nights | 1125
minimum_nights_avg_ntm | 1.0
maximum_nights_avg_ntm | 1125.0
has_availability | t
availability_30 | 30
availability_60 | 60
availability_90 | 90
availability_365 | 365
instant_bookable | t
calculated_host_listings_count | 4
calculated_host_listings_count_entire_homes | 0
calculated_host_listings_count_private_rooms | 4
calculated_host_listings_count_shared_rooms | 0
verifications_array | [email, phone, reviews, jumio, government_id]
-RECORD 15-----
-----
```

```

id | 248014
host_since | 2011/10/16
host_location | Vancouver, British Columbia, Canada
host_response_time | within a day
host_response_rate | 0.5
host_acceptance_rate | N/A
host_is_superhost | f
host_neighbourhood | Grandview-Woodland
host_listings_count | 1
host_total_listings_count | 1
host_verifications | ['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic | t
host_identity_verified | t
neighbourhood | Vancouver, British Columbia, Canada
neighbourhood_cleansed | Grandview-Woodland
neighbourhood_group_cleansed | null
latitude | 49.29103
longitude | -123.05782
property_type | Entire house
```

room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	0
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wifi', 'Host greets you', 'Dryer', 'Stove', 'Carbon monoxide alarm', 'Hot water', 'Garden or backyard', 'Dishwasher', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Free street parking', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Cable TV', 'Refrigerator', 'Hangers', 'Essentials', 'Washer', 'Long term stays allowed', 'BBQ grill', 'TV', 'Cleaning before checkout']
price	100
minimum_nights	31
maximum_nights	180
minimum_minimum_nights	31
maximum_minimum_nights	31
minimum_maximum_nights	180
maximum_maximum_nights	180
minimum_nights_avg_ntm	31.0
maximum_nights_avg_ntm	180.0
has_availability	t
availability_30	4
availability_60	4
availability_90	4
availability_365	113
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
verifications_array	[email, phone, reviews, jumio, government_id]

-RECORD 16-----

-----

-----

-----

-----

-----

id	258636
host_since	2011/08/09
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Downtown Vancouver
host_listings_count	1

host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27796
longitude	-123.12671
property_type	Entire apartment
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Iron', 'Elevator', 'Gym', 'Hangers', 'Smoke ala rm', 'Wifi', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Free parking on premises', 'Long term stays allowe d', 'Hair dryer', 'Shampoo', 'Dedicated workspace']
price	99
minimum_nights	120
maximum_nights	365
minimum_minimum_nights	120
maximum_minimum_nights	120
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	120.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	11
availability_90	41
availability_365	316
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
verifications_array	[email, phone, reviews, jumio, government_id]

-RECORD 17-----

id	283841
host_since	2009/08/10

host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.93
host_acceptance_rate	0.88
host_is_superhost	f
host_neighbourhood	Coal Harbour
host_listings_count	49
host_total_listings_count	49
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.2872
longitude	-123.12352
property_type	Entire apartment
room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	3 baths
bedrooms	3
beds	3
amenities	['Kitchen', 'Hot tub', 'Oven', 'Pool', 'Gym', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free parking on premises', 'Coffee maker', 'Dishes and silverware', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning']
price	197
minimum_nights	90
maximum_nights	1125
minimum_minimum_nights	90
maximum_minimum_nights	90
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	41
calculated_host_listings_count_entire_homes	41
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
verifications_array	[email, phone, reviews, jumio, government_id]

-RECORD 18-----

id	323090
host_since	2012/01/01
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0.85
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.28206
longitude	-123.12461
property_type	Entire apartment
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Cooking basics', 'Iron', 'Elevator', 'Gym', 'Hangers', 'Cable TV', 'Smoke alarm', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Carbon monoxide alarm', 'Wifi', 'TV', 'Long term stays allowed', 'Hair dryer', 'Shampoo', 'Dishes and silverware', 'Dedicated workspace']
price	168
minimum_nights	180
maximum_nights	180
minimum_minimum_nights	180
maximum_minimum_nights	180
minimum_maximum_nights	180
maximum_maximum_nights	180
minimum_nights_avg_ntm	180.0
maximum_nights_avg_ntm	180.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90

availability_365	141
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
verifications_array	[email, phone, reviews, jumio, government_id]
-RECORD 19-----	
-----	
-----	
-----	
id	359942
host_since	2011/09/23
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Yaletown
host_listings_count	8
host_total_listings_count	8
host_verifications	['email', 'phone', 'facebook', 'reviews']
host_has_profile_pic	t
host_identity_verified	f
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27825
longitude	-123.11865
property_type	Private room in apartment
room_type	Private room
accommodates	2
bathrooms	null
bathrooms_text	1 shared bath
bedrooms	2
beds	1
amenities	['Kitchen', 'Lake access', 'Oven', 'Paid parking on premises', 'Paid parking off premises', 'Gym', 'Microwave', 'Wifi', 'Dryer', 'Stove', 'Hot water', 'Dishwasher', 'Extra pillows and blankets', 'Cooking basics', 'Heating', 'Lock on bedroom door', 'Hair dryer', 'Iron', 'Coffee maker', 'Bed linens', 'Pocket wifi', 'Shampoo', 'Dishes and silverware', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Elevator']
price	240
minimum_nights	30
maximum_nights	1125
minimum_minimum_nights	30

```

maximum_minimum_nights      | 30
minimum_maximum_nights      | 1125
maximum_maximum_nights      | 1125
minimum_nights_avg_ntm     | 30.0
maximum_nights_avg_ntm     | 1125.0
has_availability            | t
availability_30              | 29
availability_60              | 59
availability_90              | 89
availability_365             | 364
instant_bookable             | f
calculated_host_listings_count | 7
calculated_host_listings_count_entire_homes | 3
calculated_host_listings_count_private_rooms | 4
calculated_host_listings_count_shared_rooms | 0
verifications_array          | [email, phone, facebook, reviews]
only showing top 20 rows

```

Now we can use a vectorizer to transform the arrays of strings to arrays of indexes.

```
In [29]: cv_amenities = CountVectorizer(inputCol="amenities_array", outputCol="amenities_vector",
                                    vocabSize=20, minDF=2.0)
fitted_amenities = cv_amenities.fit(amenities_splitter.transform(dataset))
stages.append(fitted_amenities)

cv_verifications = CountVectorizer(inputCol="verifications_array", outputCol="verifications_vector",
                                    vocabSize=5, minDF=2.0)
fitted_verifications = cv_verifications.fit(verifications_splitter.transform(dataset))
stages.append(fitted_verifications)
```

We keep the number of amenities and verifications under control by setting the vocabulary size.

```
In [30]: print(len(fitted_amenities.vocabulary))
fitted_amenities.vocabulary
```

20

```
Out[30]: ['Wifi',
 'Heating',
 'Smoke alarm',
 'Essentials',
 'Kitchen',
 'Hangers',
 'Long term stays allowed',
 'Washer',
```

```
'Dryer',
'Hair dryer',
'TV',
'Dedicated workspace',
'Hot water',
'Shampoo',
'Iron',
'Carbon monoxide alarm',
'Dishes and silverware',
'Fire extinguisher',
'Refrigerator',
'Cooking basics']
```

We can now build a pipeline to see the vectorizers in place.

In [31]:

```
pipeline = Pipeline(stages=stages)
pipeline.fit(dataset).transform(dataset).show(vertical=True)
```

-RECORD 0-----	
id	13358
host_since	2009/11/07
host_location	Vancouver, Britis...
host_response_time	within a day
host_response_rate	0.71
host_acceptance_rate	0.71
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone'...]
host_has_profile_pic	f
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	West End
neighbourhood_group_cleansed	null
latitude	49.28209
longitude	-123.12515
property_type	Entire condominium
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven...
price	90
minimum_nights	30
maximum_nights	60

minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	11
availability_60	41
availability_90	70
availability_365	70
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	West End
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	3.0
property_indexed	1.0
room_indexed	0.0
amenities_array	[Kitchen, Oven, G...
verifications_array	[email, phone, fa...
amenities_vector	(20,[0,1,2,3,4,5,...
verifications_vector	(5,[0,1,2,3,4],[1...
-RECORD 1-----	
id	16254
host_since	2009/12/15
host_location	Vancouver, Britis...
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Hastings-Sunrise
host_listings_count	1
host_total_listings_count	1
host_verifications	['phone', 'facebo...
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Hastings-Sunrise
neighbourhood_group_cleansed	null
latitude	49.27734
longitude	-123.04152
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	4
bathrooms	null

bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven...
price	195
minimum_nights	3
maximum_nights	31
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	228
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Hastings-Sunrise
property_reduced	Entire guest suite
room_reduced	Entire home/apt
neighbourhood_indexed	9.0
property_indexed	4.0
room_indexed	0.0
amenities_array	[Kitchen, Oven, M...
verifications_array	[phone, facebook,...
amenities_vector	(20,[0,2,3,4,5,6,...
verifications_vector	(5,[0,2,3],[1.0,1...
-RECORD 2-----	
id	17765
host_since	2010/01/07
host_location	Vancouver, Britis...
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Mount Pleasant
host_listings_count	1
host_total_listings_count	1
host_verifications	['phone', 'facebo...
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Mount Pleasant

neighbourhood_group_cleansed	null
latitude	49.26181
longitude	-123.10905
property_type	Entire apartment
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Wifi...']
price	94
minimum_nights	3
maximum_nights	60
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Mount Pleasant
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	5.0
property_indexed	0.0
room_indexed	0.0
amenities_array	[Kitchen, Wifi, H...]
verifications_array	[phone, facebook,...]
amenities_vector	(20,[0,1,2,3,4,5,...]
verifications_vector	(5,[0,2,3,4],[1.0...
-RECORD 3-----	
id	18795
host_since	2010/01/13
host_location	Vancouver, Britis...
host_response_time	within a day
host_response_rate	0.7
host_acceptance_rate	0.4
host_is_superhost	f
host_neighbourhood	West End

host_listings_count	3
host_total_listings_count	3
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	West End
neighbourhood_group_cleansed	null
latitude	49.28251
longitude	-123.12827
property_type	Private room in h...
room_type	Private room
accommodates	2
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Cabl...
price	50
minimum_nights	30
maximum_nights	360
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	360
maximum_maximum_nights	360
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	360.0
has_availability	t
availability_30	9
availability_60	20
availability_90	50
availability_365	325
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	3
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	West End
property_reduced	Private room in h...
room_reduced	Private room
neighbourhood_indexed	3.0
property_indexed	3.0
room_indexed	1.0
amenities_array	[Kitchen, Cable T...
verifications_array	[email, phone, re...
amenities_vector	(20,[0,1,3,4,6,7,...
verifications_vector	(5,[0,1,2,4],[1.0...
-RECORD 4-----	
id	21913

host_since	2010/02/22
host_location	Vancouver, Britis...
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	t
host_neighbourhood	Renfrew-Collingwood
host_listings_count	3
host_total_listings_count	3
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Renfrew-Collingwood
neighbourhood_group_cleansed	null
latitude	49.23427
longitude	-123.05309
property_type	Entire house
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven...
price	80
minimum_nights	28
maximum_nights	400
minimum_minimum_nights	28
maximum_minimum_nights	28
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	28.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	2
availability_60	13
availability_90	43
availability_365	318
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Renfrew-Collingwood
property_reduced	Entire house
room_reduced	Entire home/apt
neighbourhood_indexed	11.0
property_indexed	2.0

room_indexed	0.0
amenities_array	[Kitchen, Oven, M...
verifications_array	[email, phone, re...
amenities_vector	(20,[0,1,2,3,4,5,...
verifications_vector	(5,[0,1,2,3,4],[1...
-RECORD 5-----	
id	24273
host_since	2011/10/09
host_location	Vancouver, Britis...
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	0.82
host_is_superhost	f
host_neighbourhood	Kitsilano
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone'...]
host_has_profile_pic	f
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Kitsilano
neighbourhood_group_cleansed	null
latitude	49.2626
longitude	-123.17308
property_type	Entire apartment
room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven...
price	200
minimum_nights	30
maximum_nights	365
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	0
availability_90	10
availability_365	223
instant_bookable	f
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2

calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Kitsilano
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	2.0
property_indexed	0.0
room_indexed	0.0
amenities_array	[Kitchen, Oven, I...
verifications_array	[email, phone, re...
amenities_vector	(20,[0,1,2,3,4,5,...
verifications_vector	(5,[0,1,2,3,4],[1...
-RECORD 6-----	-----
id	42645
host_since	2010/04/17
host_location	Vancouver, Britis...
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	4
host_total_listings_count	4
host_verifications	['email', 'phone'...
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.28001
longitude	-123.12475
property_type	Entire condominium
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Oven...
price	159
minimum_nights	32
maximum_nights	365
minimum_minimum_nights	32
maximum_minimum_nights	32
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	32.0
maximum_nights_avg_ntm	1125.0
has_availability	t

availability_30	0
availability_60	29
availability_90	59
availability_365	333
instant_bookable	t
calculated_host_listings_count	4
calculated_host_listings_count_entire_homes	4
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	1.0
room_indexed	0.0
amenities_array	[Kitchen, Oven, P...]
verifications_array	[email, phone, fa...]
amenities_vector	(20,[0,1,2,3,4,5,...)
verifications_vector	(5,[0,1,4],[1.0,1...
-RECORD 7-----	
id	54261
host_since	2010/10/05
host_location	Vancouver, Britis...
host_response_time	a few days or more
host_response_rate	0
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Downtown Vancouver
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27655
longitude	-123.12485
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot ...']
price	126
minimum_nights	90
maximum_nights	365

minimum_minimum_nights	90
maximum_minimum_nights	90
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	f
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	1.0
room_indexed	0.0
amenities_array	[Kitchen, Hot tub...]
verifications_array	[email, phone, re...]
amenities_vector	(20,[0,1,2,3,4,5,...]
verifications_vector	(5,[0,1,2,3,4],[1...
-RECORD 8-----	
id	72659
host_since	2011/02/03
host_location	Vancouver, Britis...
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Commercial Drive
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.27357
longitude	-123.07024
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null

bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	['Kitchen', 'Lake...
price	210
minimum_nights	7
maximum_nights	21
minimum_minimum_nights	7
maximum_minimum_nights	7
minimum_maximum_nights	21
maximum_maximum_nights	21
minimum_nights_avg_ntm	7.0
maximum_nights_avg_ntm	21.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	40
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Grandview-Woodland
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	8.0
property_indexed	1.0
room_indexed	0.0
amenities_array	[Kitchen, Lake ac...
verifications_array	[email, phone, re...
amenities_vector	(20,[0,1,2,3,4,5,...
verifications_vector	(5,[0,1,2,4],[1.0...
-RECORD 9-----	
id	77157
host_since	2011/02/27
host_location	Vancouver, Britis...
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Arbutus Ridge
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone'...
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Arbutus Ridge

neighbourhood_group_cleansed	null
latitude	49.24675
longitude	-123.16711
property_type	Private room in g...
room_type	Private room
accommodates	3
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Micr...']
price	75
minimum_nights	3
maximum_nights	60
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	3
availability_60	3
availability_90	3
availability_365	267
instant_bookable	t
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	OTHER
property_reduced	OTHER
room_reduced	Private room
neighbourhood_indexed	1.0
property_indexed	5.0
room_indexed	1.0
amenities_array	[Kitchen, Microwa...]
verifications_array	[email, phone, fa...]
amenities_vector	(20,[0,1,2,3,4,5,...]
verifications_vector	(5,[0,1,2,3,4],[1...
-RECORD 10-----	
id	111077
host_since	2011/05/09
host_location	North Vancouver, ...
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0.33
host_is_superhost	f
host_neighbourhood	Grandview-Woodland

host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.26726
longitude	-123.05969
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	['Kitchen', 'Indo...
price	125
minimum_nights	3
maximum_nights	365
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	4
availability_60	34
availability_90	64
availability_365	339
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Grandview-Woodland
property_reduced	Entire guest suite
room_reduced	Entire home/apt
neighbourhood_indexed	8.0
property_indexed	4.0
room_indexed	0.0
amenities_array	[Kitchen, Indoor ...
verifications_array	[email, phone, fa...
amenities_vector	(20,[0,1,2,3,4,5,...
verifications_vector	(5,[0,1,2,4],[1.0...
-RECORD 11-----	
id	125176

host_since	2011/05/24
host_location	Vancouver, Britis...
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Riley Park
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Riley Park
neighbourhood_group_cleansed	null
latitude	49.24648
longitude	-123.09241
property_type	Private room in h...
room_type	Private room
accommodates	3
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	0
amenities	['Kitchen', 'Hot ...
price	75
minimum_nights	2
maximum_nights	60
minimum_minimum_nights	2
maximum_minimum_nights	2
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	2.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	2
availability_365	268
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	1
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Riley Park
property_reduced	Private room in h...
room_reduced	Private room
neighbourhood_indexed	7.0
property_indexed	3.0

room_indexed	1.0
amenities_array	[Kitchen, Hot tub...
verifications_array	[email, phone, fa...
amenities_vector	(20,[0,1,2,3,4,5,...
verifications_vector	(5,[0,1,2,3,4],[1...
-RECORD 12-----	
id	129163
host_since	2011/05/17
host_location	Vancouver, Britis...
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Renfrew-Collingwood
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Renfrew-Collingwood
neighbourhood_group_cleansed	null
latitude	49.24507
longitude	-123.04941
property_type	Private room in h...
room_type	Private room
accommodates	1
bathrooms	null
bathrooms_text	1 shared bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot ...
price	45
minimum_nights	30
maximum_nights	280
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	280
maximum_maximum_nights	280
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	280.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	0

calculated_host_listings_count_private_rooms	1
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Renfrew-Collingwood
property_reduced	Private room in h...
room_reduced	Private room
neighbourhood_indexed	11.0
property_indexed	3.0
room_indexed	1.0
amenities_array	[Kitchen, Hot wat...
verifications_array	[email, phone, re...
amenities_vector	(20,[0,1,2,3,4,6,...
verifications_vector	(5,[0,1,2,3,4],[1...
-RECORD 13-----	-----
id	174135
host_since	2011/07/17
host_location	Vancouver, Britis...
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Downtown Eastside
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone'...
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Downtown Eastside
neighbourhood_group_cleansed	null
latitude	49.27782
longitude	-123.08985
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Wifi...
price	100
minimum_nights	30
maximum_nights	365
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	365.0
has_availability	t

availability_30	0
availability_60	0
availability_90	0
availability_365	224
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown Eastside
property_reduced	Entire guest suite
room_reduced	Entire home/apt
neighbourhood_indexed	6.0
property_indexed	4.0
room_indexed	0.0
amenities_array	[Kitchen, Wifi, D...
verifications_array	[email, phone, re...
amenities_vector	(20,[0,1,2,3,4,5,...
verifications_vector	(5,[0,1,2,3,4],[1...
-RECORD 14-----	-----
id	200643
host_since	2011/08/16
host_location	Vancouver, Britis...
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Strathcona
host_listings_count	4
host_total_listings_count	4
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Downtown Eastside
neighbourhood_group_cleansed	null
latitude	49.27384
longitude	-123.08289
property_type	Private room in h...
room_type	Private room
accommodates	4
bathrooms	null
bathrooms_text	2 shared baths
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven...
price	87
minimum_nights	1
maximum_nights	1125

minimum_minimum_nights	1
maximum_minimum_nights	1
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	1.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	t
calculated_host_listings_count	4
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	4
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown Eastside
property_reduced	Private room in h...
room_reduced	Private room
neighbourhood_indexed	6.0
property_indexed	3.0
room_indexed	1.0
amenities_array	[Kitchen, Oven, I...
verifications_array	[email, phone, re...
amenities_vector	(20,[0,1,2,3,4,5,...
verifications_vector	(5,[0,1,2,4],[1.0...
-RECORD 15-----	
id	248014
host_since	2011/10/16
host_location	Vancouver, Britis...
host_response_time	within a day
host_response_rate	0.5
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Grandview-Woodland
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone'...
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.29103
longitude	-123.05782
property_type	Entire house
room_type	Entire home/apt
accommodates	3
bathrooms	null

bathrooms_text	1 bath
bedrooms	2
beds	0
amenities	['Kitchen', 'Oven...
price	100
minimum_nights	31
maximum_nights	180
minimum_minimum_nights	31
maximum_minimum_nights	31
minimum_maximum_nights	180
maximum_maximum_nights	180
minimum_nights_avg_ntm	31.0
maximum_nights_avg_ntm	180.0
has_availability	t
availability_30	4
availability_60	4
availability_90	4
availability_365	113
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Grandview-Woodland
property_reduced	Entire house
room_reduced	Entire home/apt
neighbourhood_indexed	8.0
property_indexed	2.0
room_indexed	0.0
amenities_array	[Kitchen, Oven, I...
verifications_array	[email, phone, re...
amenities_vector	(20,[0,1,2,3,4,5,...
verifications_vector	(5,[0,1,2,4],[1.0...
-RECORD 16-----	
id	258636
host_since	2011/08/09
host_location	Vancouver, Britis...
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone'...
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown

neighbourhood_group_cleansed	null
latitude	49.27796
longitude	-123.12671
property_type	Entire apartment
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Iron...
price	99
minimum_nights	120
maximum_nights	365
minimum_minimum_nights	120
maximum_minimum_nights	120
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	120.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	11
availability_90	41
availability_365	316
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	0.0
room_indexed	0.0
amenities_array	[Kitchen, Iron, E...
verifications_array	[email, phone, re...
amenities_vector	(20,[0,1,2,3,4,5,...
verifications_vector	(5,[0,1,2,4],[1.0...
-RECORD 17-----	
id	283841
host_since	2009/08/10
host_location	Vancouver, Britis...
host_response_time	within a day
host_response_rate	0.93
host_acceptance_rate	0.88
host_is_superhost	f
host_neighbourhood	Coal Harbour

host_listings_count	49
host_total_listings_count	49
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.2872
longitude	-123.12352
property_type	Entire apartment
room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	3 baths
bedrooms	3
beds	3
amenities	['Kitchen', 'Hot ...
price	197
minimum_nights	90
maximum_nights	1125
minimum_minimum_nights	90
maximum_minimum_nights	90
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	41
calculated_host_listings_count_entire_homes	41
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	0.0
room_indexed	0.0
amenities_array	[Kitchen, Hot tub...
verifications_array	[email, phone, re...
amenities_vector	(20,[0,1,2,3,4,5,...
verifications_vector	(5,[0,1,2,4],[1.0...
-RECORD 18-----	
id	323090

host_since	2012/01/01
host_location	Vancouver, Britis...
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0.85
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone'...]
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.28206
longitude	-123.12461
property_type	Entire apartment
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Cook...
price	168
minimum_nights	180
maximum_nights	180
minimum_minimum_nights	180
maximum_minimum_nights	180
minimum_maximum_nights	180
maximum_maximum_nights	180
minimum_nights_avg_ntm	180.0
maximum_nights_avg_ntm	180.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	141
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	0.0

room_indexed	0.0
amenities_array	[Kitchen, Cooking...
verifications_array	[email, phone, re...
amenities_vector	(20,[0,1,2,3,4,5,...
verifications_vector	(5,[0,1,2,4],[1.0...
-RECORD 19-----	
id	359942
host_since	2011/09/23
host_location	Vancouver, Britis...
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Yaletown
host_listings_count	8
host_total_listings_count	8
host_verifications	['email', 'phone'...
host_has_profile_pic	t
host_identity_verified	f
neighbourhood	Vancouver, Britis...
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27825
longitude	-123.11865
property_type	Private room in a...
room_type	Private room
accommodates	2
bathrooms	null
bathrooms_text	1 shared bath
bedrooms	2
beds	1
amenities	['Kitchen', 'Lake...
price	240
minimum_nights	30
maximum_nights	1125
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	29
availability_60	59
availability_90	89
availability_365	364
instant_bookable	f
calculated_host_listings_count	7
calculated_host_listings_count_entire_homes	3

```

calculated_host_listings_count_private_rooms | 4
calculated_host_listings_count_shared_rooms | 0
neighbourhood_reduced | Downtown
property_reduced | Private room in a...
room_reduced | Private room
neighbourhood_indexed | 0.0
property_indexed | 6.0
room_indexed | 1.0
amenities_array | [Kitchen, Lake ac...
verifications_array | [email, phone, fa...
amenities_vector | (20,[0,1,3,4,5,6,...)
verifications_vector | (5,[0,1,4],[1.0,1...
only showing top 20 rows

```

## Decomposing complex features: host\_since

Finally, we will deal with the date in `host_since` by changing the `string` to an `int` by keeping only the years.

In [32]:

```

class YearKeeper(UnaryTransformer):

    def createTransformFunc(self):
        def keep_year(s):
            if type(s) is str and len(s)>4:
                return int(s.split("/")[0])
            return None
        return keep_year

    def outputDataType(self):
        return IntegerType()

    def validateInputType(self, inputType):
        assert inputType == StringType(), f'Expected StringType() and found {inputType}'

year_keeper = YearKeeper(). \
    setInputCol('host_since'). \
    setOutputCol('since_year')

year_keeper.transform(dataset).show(vertical=True, truncate=False)
stages.append(year_keeper)

```

-RECORD 0-----

-----  
-----  
-----

id	13358
host_since	2009/11/07
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.71
host_acceptance_rate	0.71
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'offline_
government_id', 'selfie', 'government_id']	f
host_has_profile_pic	t
host_identity_verified	null
neighbourhood	West End
neighbourhood_cleansed	null
neighbourhood_group_cleansed	49.28209
latitude	-123.12515
longitude	Entire condominium
property_type	Entire home/apt
room_type	2
accommodates	null
bathrooms	1 bath
bathrooms_text	1
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Gym', 'Paid parking off premises', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Extra pillows and blankets', 'Dish washer', 'Cooking basics', 'Hot water kettle', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning', 'Elevator']
price	90
minimum_nights	30
maximum_nights	60
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	11
availability_60	41
availability_90	70

availability_365	70
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
since_year	2009
-RECORD 1-----	
-----	
-----	
-----	
-----	
id	16254
host_since	2009/12/15
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Hastings-Sunrise
host_listings_count	1
host_total_listings_count	1
host_verifications	['phone', 'facebook', 'offline_government_id', 'selfie', 'go
vernment_id', 'identity_manual']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Hastings-Sunrise
neighbourhood_group_cleansed	null
latitude	49.27734
longitude	-123.04152
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basic skills', 'Private entrance', 'Smoke alarm', 'Hair dryer', 'Lockbox', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Children\u2019s books and toys', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib']
price	195
minimum_nights	3

maximum_nights	31
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	228
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
since_year	2009

-RECORD 2-

id	17765
host_since	2010/01/07
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Mount Pleasant
host_listings_count	1
host_total_listings_count	1
host_verifications	['phone', 'facebook', 'reviews', 'jumio', 'offline_governmen
t_id', 'selfie', 'government_id']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Mount Pleasant
neighbourhood_group_cleansed	null
latitude	49.26181
longitude	-123.10905
property_type	Entire apartment
room_type	Entire home/apt
accommodates	2
bathrooms	null

bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Essentials', 'Washer', 'Long term stays allowed', 'Elevator']
price	94
minimum_nights	3
maximum_nights	60
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
since_year	2010
-RFC0013-----	

<code>id</code>	18795
<code>host_since</code>	2010/01/13
<code>host_location</code>	Vancouver, British Columbia, Canada
<code>host_response_time</code>	within a day
<code>host_response_rate</code>	0.7
<code>host_acceptance_rate</code>	0.4
<code>host_is_superhost</code>	f
<code>host_neighbourhood</code>	West End
<code>host_listings_count</code>	3
<code>host_total_listings_count</code>	3
<code>host_verifications</code>	['email', 'phone', 'reviews', 'jumio', 'government_id']
<code>host_has_profile_pic</code>	t
<code>host_identity_verified</code>	t
<code>neighbourhood</code>	null

neighbourhood_cleansed	West End
neighbourhood_group_cleansed	null
latitude	49.28251
longitude	-123.12827
property_type	Private room in house
room_type	Private room
accommodates	2
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Cable TV', 'Wifi', 'Essentials', 'Heating', 'Wa
sher', 'Dryer', 'Long term stays allowed']	
price	50
minimum_nights	30
maximum_nights	360
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	360
maximum_maximum_nights	360
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	360.0
has_availability	t
availability_30	9
availability_60	20
availability_90	50
availability_365	325
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	3
calculated_host_listings_count_shared_rooms	0
since_year	2010

-RECORD 4

<code>id</code>	21913
<code>host_since</code>	2010/02/22
<code>host_location</code>	Vancouver, British Columbia, Canada
<code>host_response_time</code>	within an hour
<code>host_response_rate</code>	1
<code>host_acceptance_rate</code>	1
<code>host_is_superhost</code>	t
<code>host_neighbourhood</code>	Renfrew-Collingwood

host_listings_count	3
host_total_listings_count	3
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'selfie', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Renfrew-Collingwood
neighbourhood_group_cleansed	null
latitude	49.23427
longitude	-123.05309
property_type	Entire house
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Luggage dropoff allowed', 'Private entrance', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Bed linens', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV']
price	80
minimum_nights	28
maximum_nights	400
minimum_minimum_nights	28
maximum_minimum_nights	28
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	28.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	2
availability_60	13
availability_90	43
availability_365	318
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0
since_year	2010

-RECORD 5-----

-----

-----

-----

-----

id	24273
host_since	2011/10/09
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	0.82
host_is_superhost	f
host_neighbourhood	Kitsilano
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'jumio', 'offline_government_id', 'government_id']
host_has_profile_pic	f
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Kitsilano
neighbourhood_group_cleansed	null
latitude	49.2626
longitude	-123.17308
property_type	Entire apartment
room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Fireplace guards', 'Carbon monoxide alarm', 'Stove', 'Crib', 'Hot water', 'Babysitter recommendations', 'Garden or backyard', 'Extra pillows and blankets', 'Dishwasher', 'Luggage dropoff allowed', 'Cooking basics', 'Room-darkening shades', 'Private entrance', 'Smoke alarm', 'Baking sheet', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bathtub', 'Coffee maker', 'Bed linens', 'Keypad', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Shower gel', 'Patio or balcony', 'Children\u2019s books and toys', 'High chair', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib', 'TV', 'Ethernet connection']
price	200
minimum_nights	30
maximum_nights	365
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	0
availability_90	10

availability_365	223
instant_bookable	f
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
since_year	2011
-RECORD 6-----	
-----	
-----	
-----	
id	42645
host_since	2010/04/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	4
host_total_listings_count	4
host_verifications	['email', 'phone', 'facebook', 'reviews']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.28001
longitude	-123.12475
property_type	Entire condominium
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Oven', 'Paid parking on premises', 'Paid parking off premises', 'Gym', 'Microwave', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Luggage dropoff allowed', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Coffee maker', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Patio or balcony', 'Children\u2019s books and toys', 'High chair', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib', 'TV', 'Elevator']
price	159
minimum_nights	32



bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot tub', 'Gym', 'Indoor fireplace', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free parking on premises', 'Shampoo', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning', 'Elevator']
price	126
minimum_nights	90
maximum_nights	365
minimum_minimum_nights	90
maximum_minimum_nights	90
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	f
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
since_year	2010
-RECORD_8-----	

-RECORD 8-

id	72659
host_since	2011/02/03
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Commercial Drive
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t

neighbourhood	null
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.27357
longitude	-123.07024
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	<ul style="list-style-type: none"><li>'Kitchen', 'Lake access', 'Oven', 'Paid parking off premise</li><li>s', 'Gym', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'BBQ grill', 'TV', 'Elevator'</li></ul>
price	210
minimum_nights	7
maximum_nights	21
minimum_minimum_nights	7
maximum_minimum_nights	7
minimum_maximum_nights	21
maximum_maximum_nights	21
minimum_nights_avg_ntm	7.0
maximum_nights_avg_ntm	21.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	40
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
since_year	2011

-RECORD 9-----

---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---

id	77157
host_since	2011/02/27
host_location	Vancouver, British Columbia, Canada

host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Arbutus Ridge
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'offline_government_id', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Arbutus Ridge
neighbourhood_group_cleansed	null
latitude	49.24675
longitude	-123.16711
property_type	Private room in guest suite
room_type	Private room
accommodates	3
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Microwave', 'Wifi', 'Laundromat nearby', 'Dryer', 'Hot water', 'Garden or backyard', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Heating', 'Mini fridge', 'Single level home', 'Hair dryer', 'Lockbox', 'Dedicated workspace', 'First aid kit', 'Iron', 'Body soap', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Barbecue utensils', 'Shower gel', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Conditioner', 'BBQ grill', 'Beach essentials', 'TV', 'Long term stays allowed']
price	75
minimum_nights	3
maximum_nights	60
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	3
availability_60	3
availability_90	3
availability_365	267
instant_bookable	t
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0

since_year	2011
-RECORD 10-----	
-----	
-----	
id	111077
host_since	2011/05/09
host_location	North Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0.33
host_is_superhost	f
host_neighbourhood	Grandview-Woodland
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'governme
nt_id']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.26726
longitude	-123.05969
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	['Kitchen', 'Indoor fireplace', 'Microwave', 'Wifi', 'Drye
r', 'Stove', 'Hot water', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Heating', 'Hair dryer', 'Iro	
n', 'Free street parking', 'Coffee maker', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Fire extinguishe	
r', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed']	
price	125
minimum_nights	3
maximum_nights	365
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	365.0
has_availability	t

availability_30	4
availability_60	34
availability_90	64
availability_365	339
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
since_year	2011
-RECORD 11-----	
-----	
-----	
-----	
-----	
-----	
id	125176
host_since	2011/05/24
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Riley Park
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'offline_governmen
t_id', 'government_id', 'work_email']	t
host_has_profile_pic	t
host_identity_verified	Vancouver, British Columbia, Canada
neighbourhood	Riley Park
neighbourhood_cleansed	null
neighbourhood_group_cleansed	49.24648
latitude	-123.09241
longitude	Private room in house
property_type	Private room
room_type	3
accommodates	null
bathrooms	1 private bath
bathrooms_text	1
bedrooms	0
beds	['Kitchen', 'Hot tub', 'Oven', 'Wifi', 'Carbon monoxide alar
amenities	m', 'Stove', 'Hot water', 'Garden or backyard', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bathtub', 'Free parking on premises', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Patio or balcony', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Long term stays allowed', 'TV']

price	75
minimum_nights	2
maximum_nights	60
minimum_minimum_nights	2
maximum_minimum_nights	2
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	2.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	2
availability_365	268
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	1
calculated_host_listings_count_shared_rooms	0
since_year	2011
-RECORD 12-----	

-RECORD 12-

id	129163
host_since	2011/05/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Renfrew-Collingwood
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'jumio', 'offline_government_id', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Renfrew-Collingwood
neighbourhood_group_cleansed	null
latitude	49.24507
longitude	-123.04941
property_type	Private room in house
room type	Private room

accommodates	1
bathrooms	null
bathrooms_text	1 shared bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot water', 'Paid parking on premises', 'Lock o n bedroom door', 'Free street parking', 'Cable TV', 'Smoke alarm', 'Wifi', 'Essentials', 'Heating', 'Washe r', 'Dryer', 'Carbon monoxide alarm', 'Dishes and silverware', 'TV', 'Long term stays allowed', 'Host greets you', 'Hair dryer', 'Shampoo', 'Fire extinguisher']
price	45
minimum_nights	30
maximum_nights	280
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	280
maximum_maximum_nights	280
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	280.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	1
calculated_host_listings_count_shared_rooms	0
since_year	2011

id	174135
host_since	2011/07/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Downtown Eastside
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'selfie', 'government id', 'identity manual']

host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown Eastside
neighbourhood_group_cleansed	null
latitude	49.27782
longitude	-123.08985
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Private entrance', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning']
price	100
minimum_nights	30
maximum_nights	365
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	224
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
since_year	2011

-RECORD 14-----

---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---

id	200643
host_since	2011/08/16
host_location	Vancouver, British Columbia, Canada

host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Strathcona
host_listings_count	4
host_total_listings_count	4
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown Eastside
neighbourhood_group_cleansed	null
latitude	49.27384
longitude	-123.08289
property_type	Private room in house
room_type	Private room
accommodates	4
bathrooms	null
bathrooms_text	2 shared baths
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Garden or backyard', 'Dishwasher', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Room-darkening shades', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib']
price	87
minimum_nights	1
maximum_nights	1125
minimum_minimum_nights	1
maximum_minimum_nights	1
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	1.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	t
calculated_host_listings_count	4
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	4
calculated_host_listings_count_shared_rooms	0
since_year	2011

-RECORD 15-----

id	248014
host_since	2011/10/16
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.5
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Grandview-Woodland
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.29103
longitude	-123.05782
property_type	Entire house
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	0
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wifi', 'Host greets you', 'Dryer', 'Stove', 'Carbon monoxide alarm', 'Hot water', 'Garden or backyard', 'Dishwasher', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Free street parking', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Cable TV', 'Refrigerator', 'Hangers', 'Essentials', 'Washer', 'Long term stays allowed', 'BBQ grill', 'TV', 'Cleaning before checkout']
price	100
minimum_nights	31
maximum_nights	180
minimum_minimum_nights	31
maximum_minimum_nights	31
minimum_maximum_nights	180
maximum_maximum_nights	180
minimum_nights_avg_ntm	31.0
maximum_nights_avg_ntm	180.0
has_availability	t
availability_30	4

availability_60	4
availability_90	4
availability_365	113
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
since_year	2011
-RECORD 16-----	
-----	
-----	
-----	
id	258636
host_since	2011/08/09
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27796
longitude	-123.12671
property_type	Entire apartment
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Iron', 'Elevator', 'Gym', 'Hangers', 'Smoke ala rm', 'Wifi', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Free parking on premises', 'Long term stays allowed', 'Hair dryer', 'Shampoo', 'Dedicated workspace']
price	99
minimum_nights	120
maximum_nights	365
minimum_minimum_nights	120

maximum_minimum_nights	120
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	120.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	11
availability_90	41
availability_365	316
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
since_year	2011
-RECORD 17-	
-----	
-----	
id	283841
host_since	2009/08/10
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.93
host_acceptance_rate	0.88
host_is_superhost	f
host_neighbourhood	Coal Harbour
host_listings_count	49
host_total_listings_count	49
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.2872
longitude	-123.12352
property_type	Entire apartment
room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	3 baths
bedrooms	3
beds	3

amenities	['Kitchen', 'Hot tub', 'Oven', 'Pool', 'Gym', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free parking on premises', 'Coffee maker', 'Dishes and silverware', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning']
price	197
minimum_nights	90
maximum_nights	1125
minimum_minimum_nights	90
maximum_minimum_nights	90
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	41
calculated_host_listings_count_entire_homes	41
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
since_year	2009

-RECORD 18-----

-RECORD 18-

id	323090
host_since	2012/01/01
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0.85
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null

latitude	49.28206
longitude	-123.12461
property_type	Entire apartment
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	<code>['Kitchen', 'Cooking basics', 'Iron', 'Elevator', 'Gym', 'Hangers', 'Cable TV', 'Smoke alarm', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Carbon monoxide alarm', 'Wifi', 'TV', 'Long term stays allowed', 'Hair dryer', 'Shampoo', 'Dishes and silverware', 'Dedicated workspace']</code>
price	168
minimum_nights	180
maximum_nights	180
minimum_minimum_nights	180
maximum_minimum_nights	180
minimum_maximum_nights	180
maximum_maximum_nights	180
minimum_nights_avg_ntm	180.0
maximum_nights_avg_ntm	180.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	141
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
since_year	2012

-RECORD 19-

id	359942
host_since	2011/09/23
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Yaletown

host_listings_count	8
host_total_listings_count	8
host_verifications	['email', 'phone', 'facebook', 'reviews']
host_has_profile_pic	t
host_identity_verified	f
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27825
longitude	-123.11865
property_type	Private room in apartment
room_type	Private room
accommodates	2
bathrooms	null
bathrooms_text	1 shared bath
bedrooms	2
beds	1
amenities	['Kitchen', 'Lake access', 'Oven', 'Paid parking on premises', 'Paid parking off premises', 'Gym', 'Microwave', 'Wifi', 'Dryer', 'Stove', 'Hot water', 'Dishwasher', 'Extra pillows and blankets', 'Cooking basics', 'Heating', 'Lock on bedroom door', 'Hair dryer', 'Iron', 'Coffee maker', 'Bed linens', 'Pocket wifi', 'Shampoo', 'Dishes and silverware', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Elevator']
price	240
minimum_nights	30
maximum_nights	1125
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	29
availability_60	59
availability_90	89
availability_365	364
instant_bookable	f
calculated_host_listings_count	7
calculated_host_listings_count_entire_homes	3
calculated_host_listings_count_private_rooms	4
calculated_host_listings_count_shared_rooms	0
since_year	2011

only showing top 20 rows

EDA

We will now plot rows against target of our dataset transformed as we have so far.

```
In [33]: pipeline = Pipeline(stages=stages)
df = pipeline.fit(dataset).transform(dataset)
```

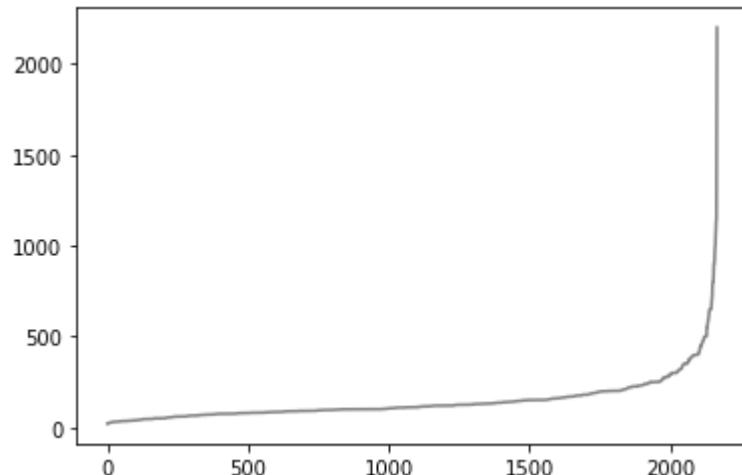
```
In [34]: import matplotlib.pyplot as plt
%matplotlib inline

prices = [ p['price']  for p in df.select("price").toLocalIterator() ]

prices = sorted(prices)

plt.plot(prices, label="prices", color='gray')
```

```
Out[34]: [<matplotlib.lines.Line2D at 0x7fbc7a27b950>]
```

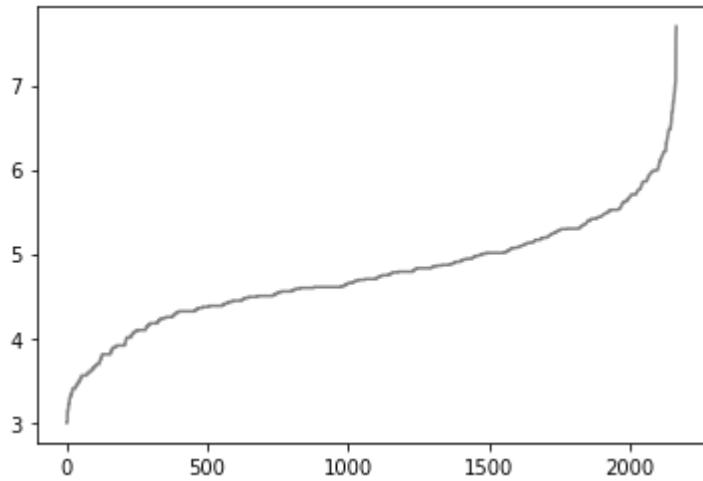


This curve can profit from flattening using a log to better understand it.

```
In [35]: prices = list(map(math.log, prices))

plt.plot(prices, label="prices", color='gray')
```

```
Out[35]: [<matplotlib.lines.Line2D at 0x7fbc7a14d110>]
```



In [36]:

```
class LogTransformer(UnaryTransformer):

    def createTransformFunc(self):
        return lambda x: None if x is None else math.log(x)

    def outputDataType(self):
        return DoubleType()

    def validateInputType(self, inputType):
        assert inputType == IntegerType(), f'Expected IntegerType and found {inputType}'

    log_transformer = LogTransformer().\
        setInputCol("price").\
        setOutputCol("log_price")
    stages.append(log_transformer)

    pipeline = Pipeline(stages=stages)
    df = pipeline.fit(dataset).transform(dataset)
```

Let us look at the types of the current columns.

In [37]:

```
for col in df.columns:
    print(df.schema[col].dataType.typeName(), ': ', col)

integer : id
string : host_since
string : host_location
```

```
string : host_response_time
string : host_response_rate
string : host_acceptance_rate
string : host_is_superhost
string : host_neighbourhood
integer : host_listings_count
integer : host_total_listings_count
string : host_verifications
string : host_has_profile_pic
string : host_identity_verified
string : neighbourhood
string : neighbourhood_cleansed
string : neighbourhood_group_cleansed
double : latitude
double : longitude
string : property_type
string : room_type
integer : accommodates
string : bathrooms
string : bathrooms_text
integer : bedrooms
integer : beds
string : amenities
integer : price
integer : minimum_nights
integer : maximum_nights
integer : minimum_minimum_nights
integer : maximum_minimum_nights
integer : minimum_maximum_nights
integer : maximum_maximum_nights
double : minimum_nights_avg_ntm
double : maximum_nights_avg_ntm
string : has_availability
integer : availability_30
integer : availability_60
integer : availability_90
integer : availability_365
string : instant_bookable
integer : calculated_host_listings_count
integer : calculated_host_listings_count_entire_homes
integer : calculated_host_listings_count_private_rooms
integer : calculated_host_listings_count_shared_rooms
string : neighbourhood_reduced
string : property_reduced
string : room_reduced
double : neighbourhood_indexed
double : property_indexed
double : room_indexed
array : amenities_array
```

```
array : verifications_array
vectorudt : amenities_vector
vectorudt : verifications_vector
integer : since_year
double : log_price
```

We can now plot each of the numeric columns against the target ( `log_price` ).

In [38]:

```
plottable = 0

for col in df.columns:
    _type = df.schema[col].dataType.typeName()
    if (_type == 'double' or _type == 'integer') and (col != 'price'):
        plottable += 1

plt.rcParams['figure.figsize'] = [5, 5 * plottable]

current = 0
for col in df.columns:
    _type = df.schema[col].dataType.typeName()
    if (_type == 'double' or _type == 'integer') \
        and (col != 'price') and (col != 'log_price'):
        current += 1
        plt.subplot(plottable, 1, current)

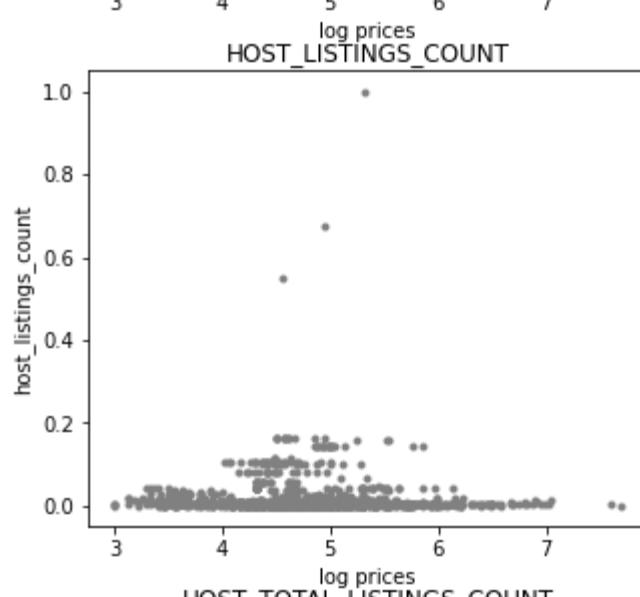
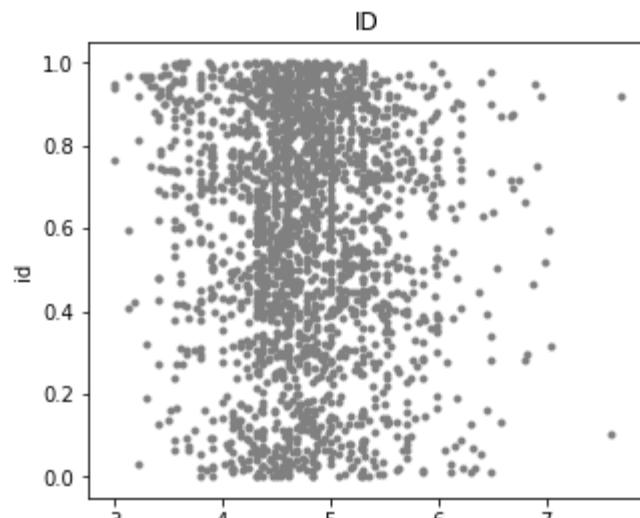
        pairs = list()
        for p in df.select("log_price", col).toLocalIterator():
            pairs.append( (p['log_price'], p[col]) )
        pairs = sorted(pairs, key=lambda t:t[0])
        vals = [ t[1] for t in pairs if t[1] is not None ]
        minv = min(vals)
        maxv = max(vals)
        if minv != maxv:
            vals = list(map(lambda x: x if x is None else (x-minv)/(maxv-minv), vals))
        logp = [ t[0] for t in pairs if t[1] is not None ]

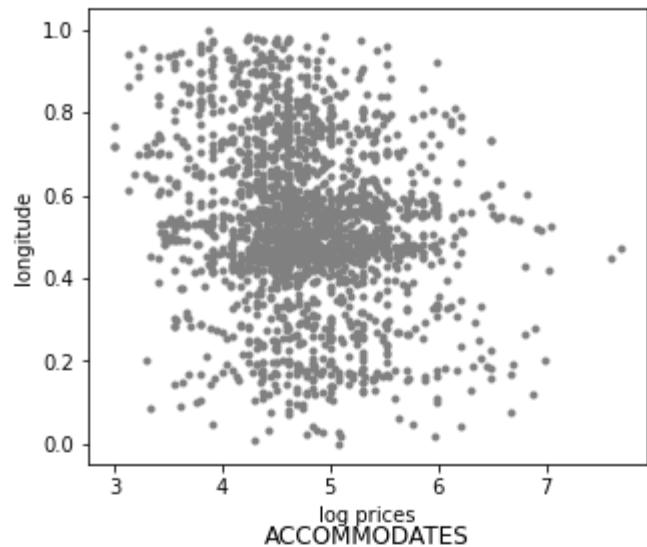
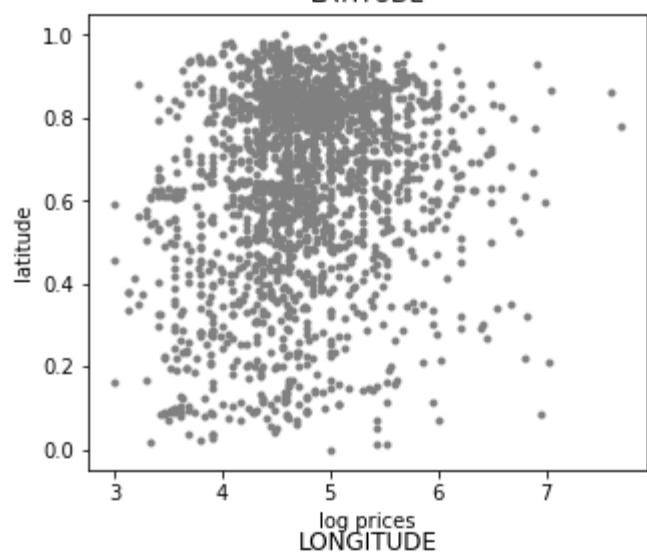
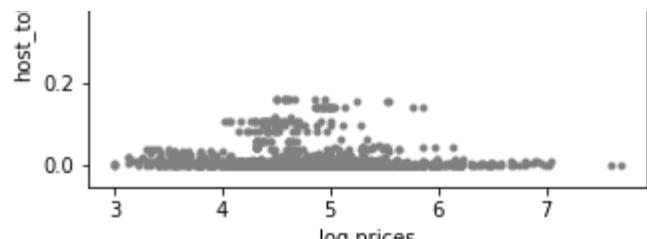
        plt.plot(logp, vals, '.', color='gray')

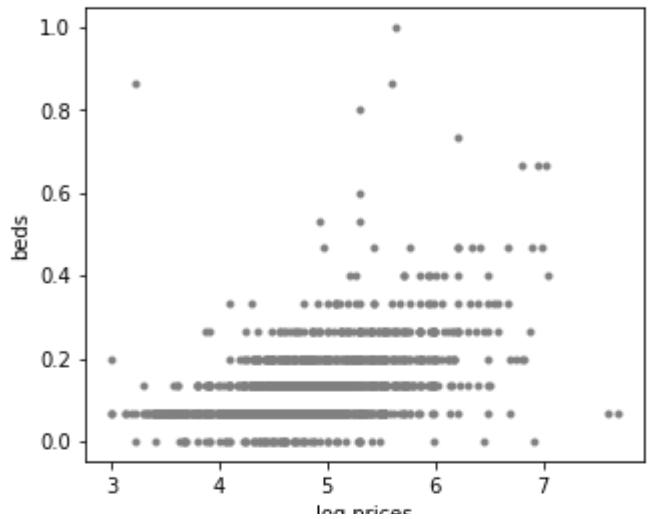
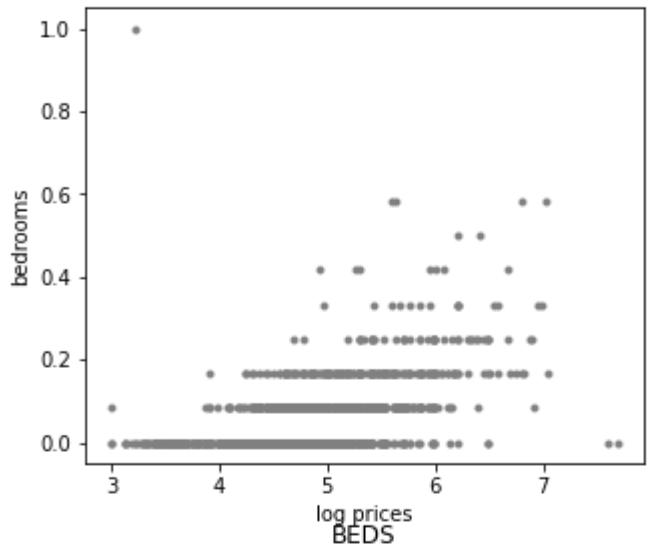
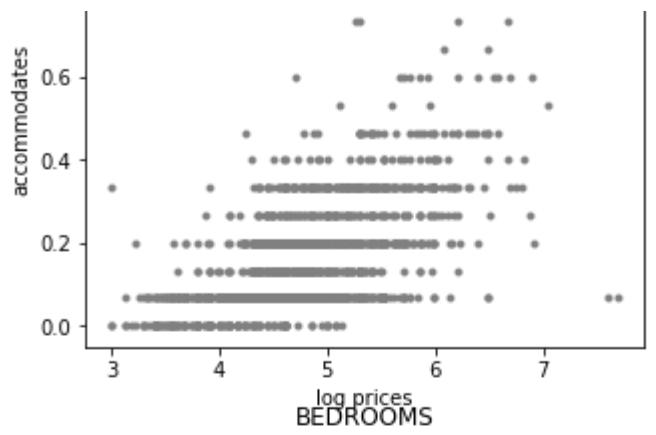
        plt.xlabel('log prices')
        plt.ylabel(col)
        plt.title(col.upper())

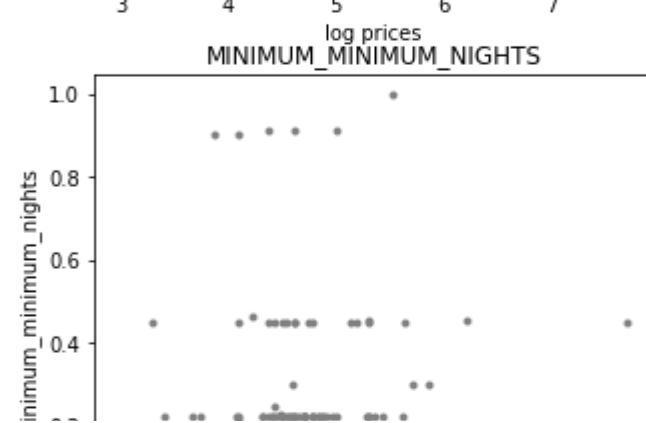
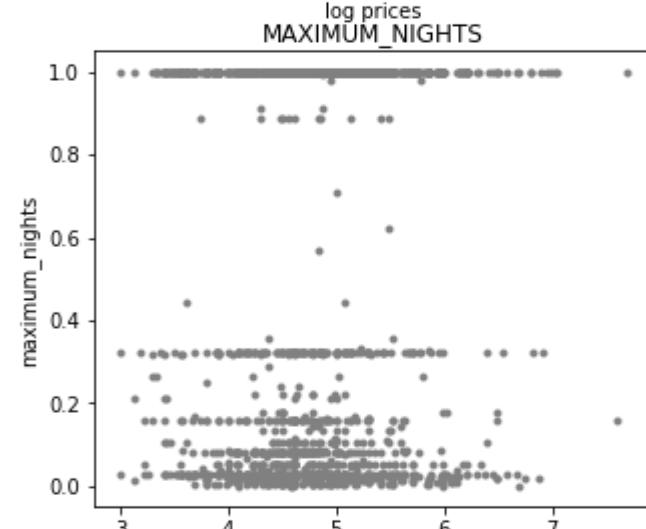
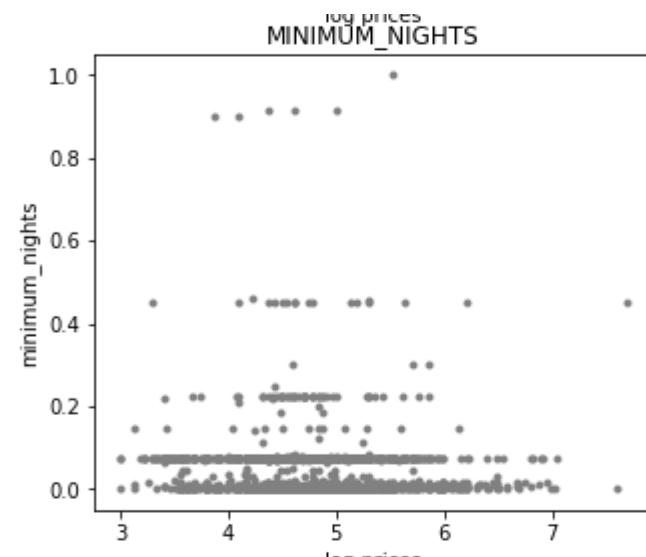
plt.savefig("eda.png", bbox_inches='tight', dpi=300)
plt
```

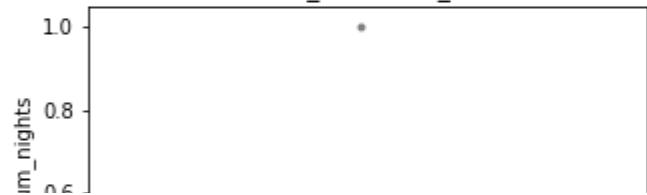
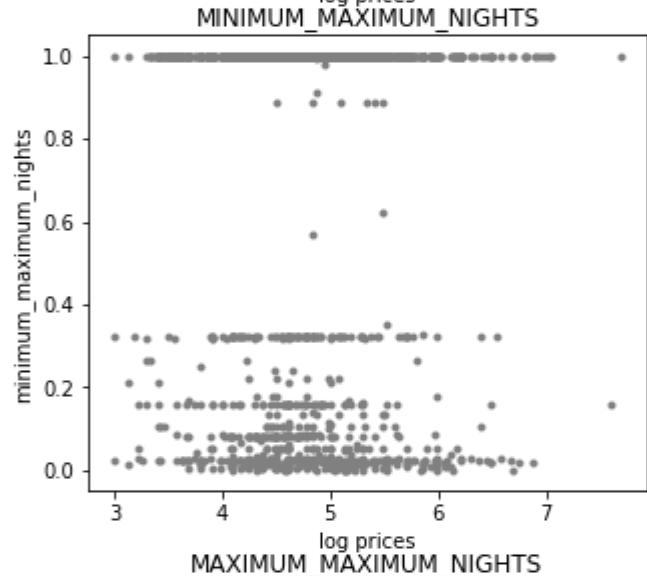
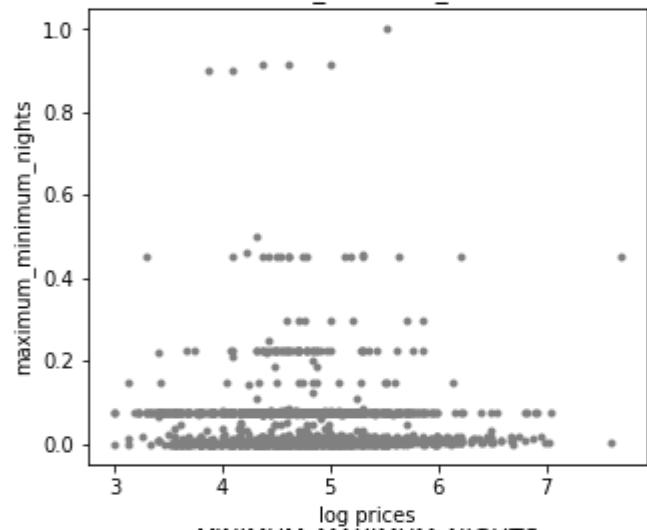
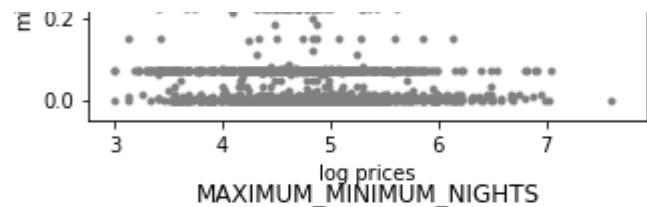
```
Out[38]: <module 'matplotlib.pyplot' from '/vol/scratch/virtualenv/tourism/lib/python3.7/site-packages/matplotlib/pyplot.py'>
```

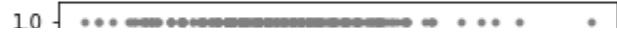
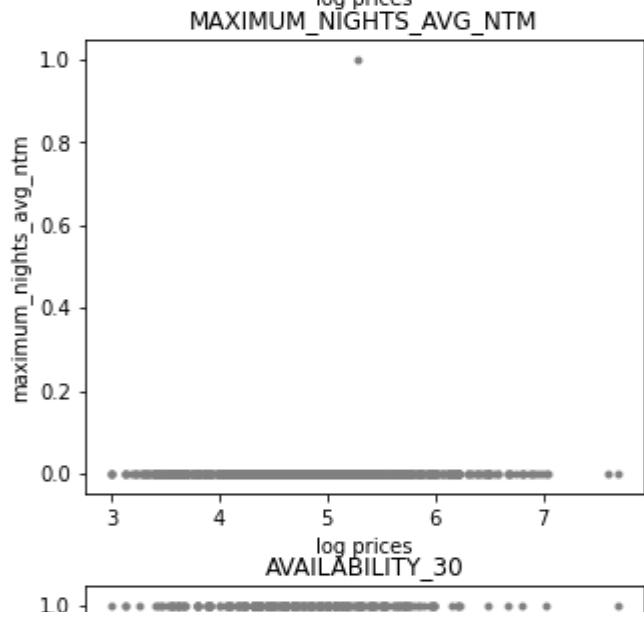
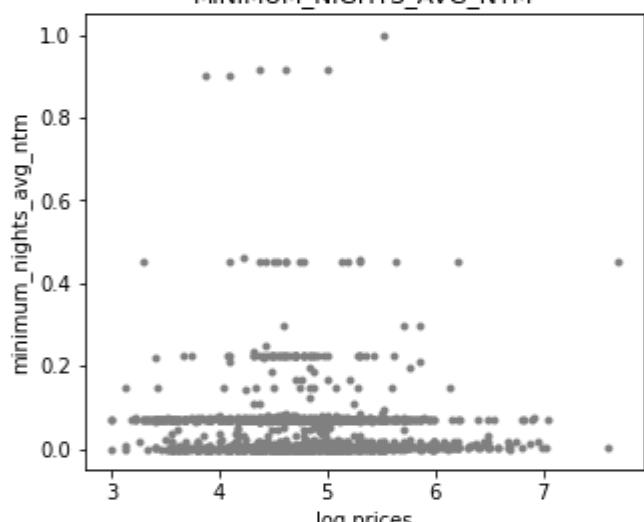
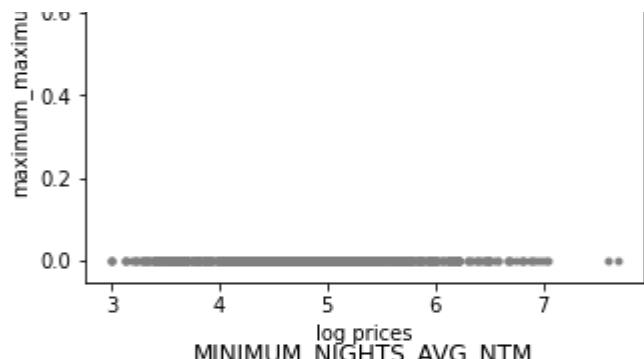


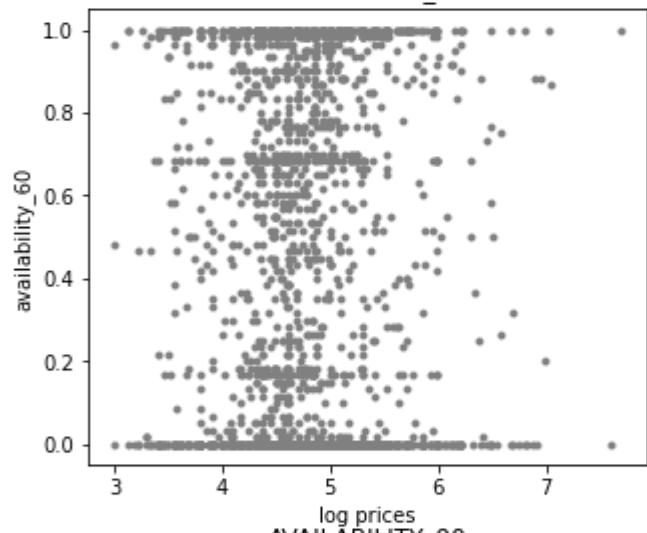
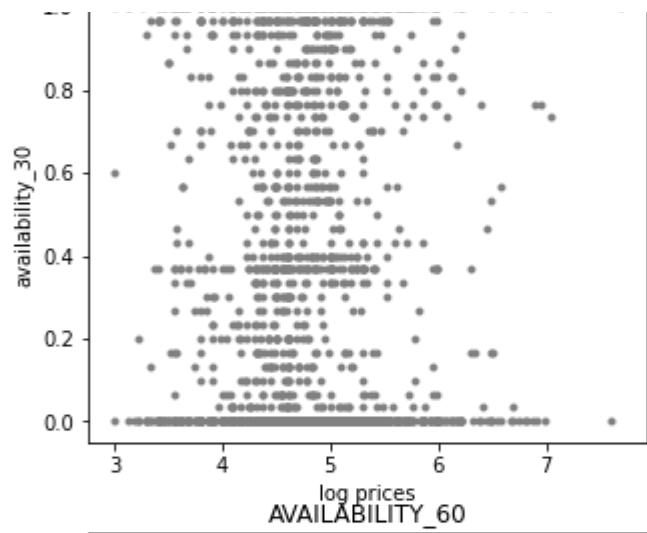


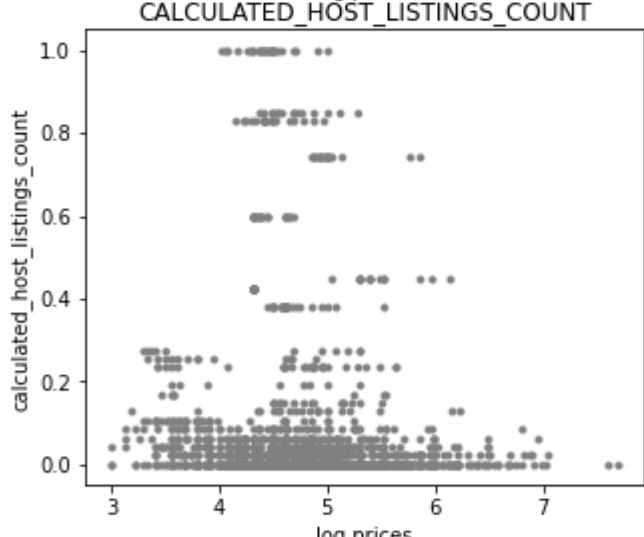
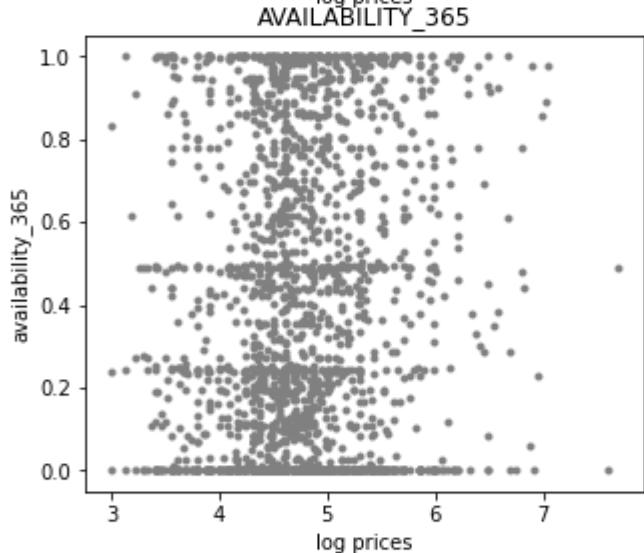
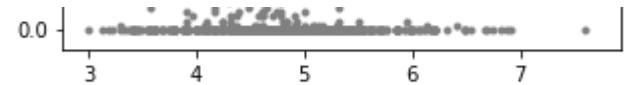


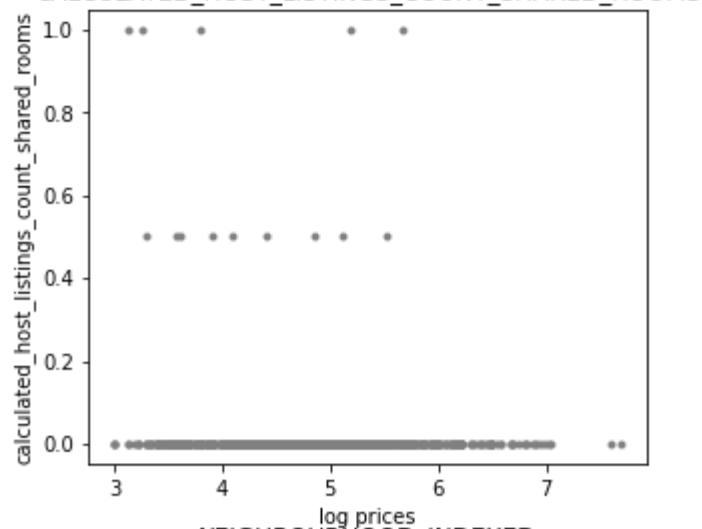
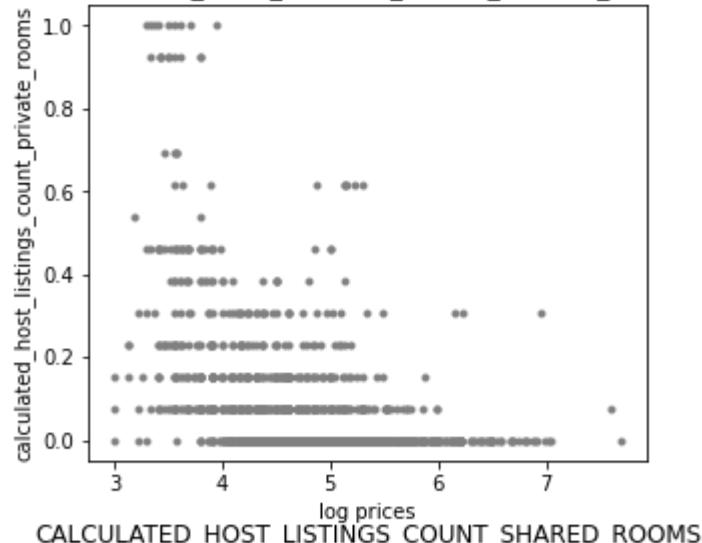
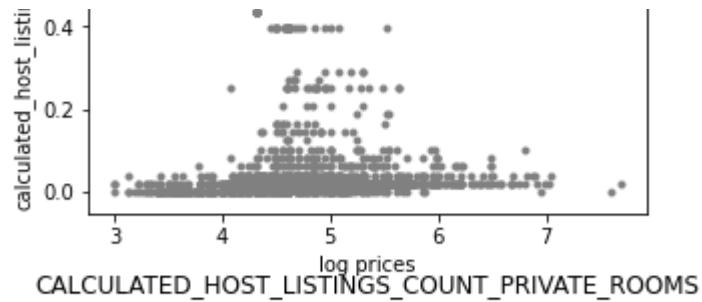


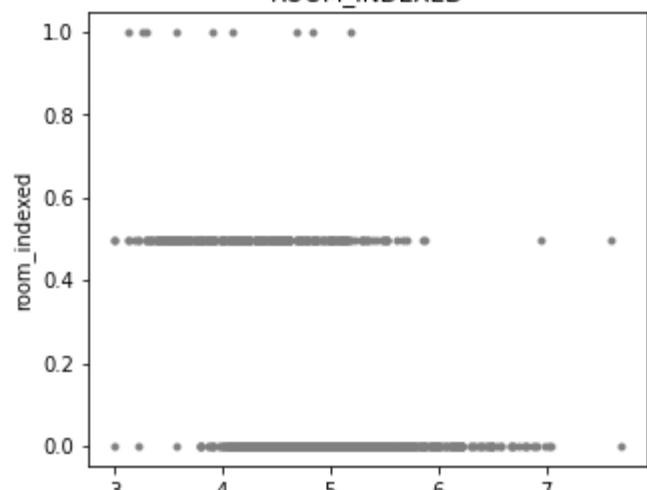
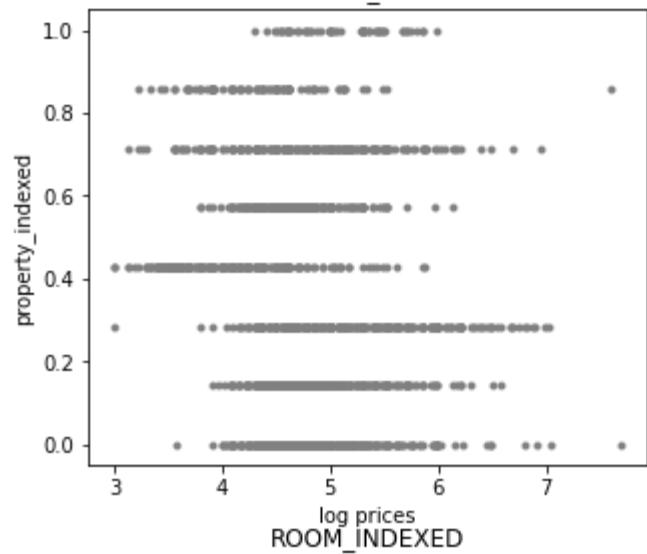
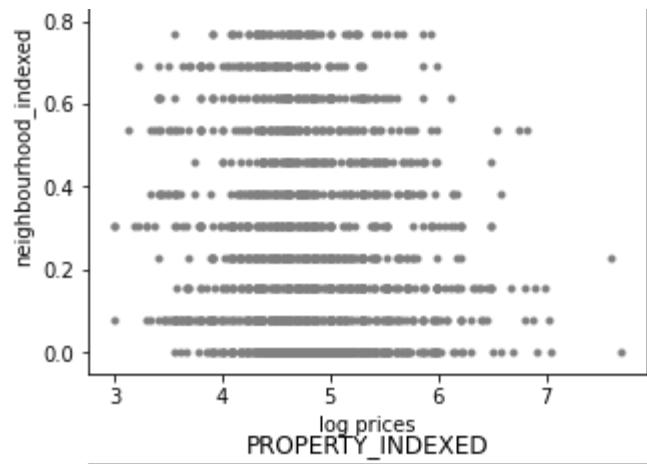


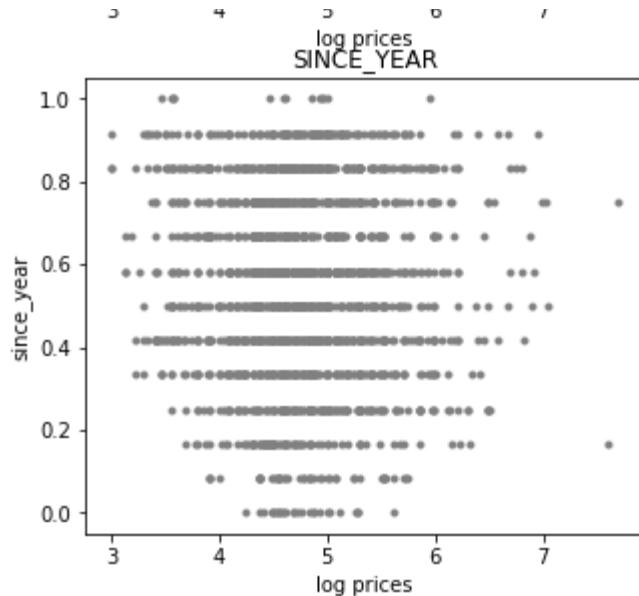












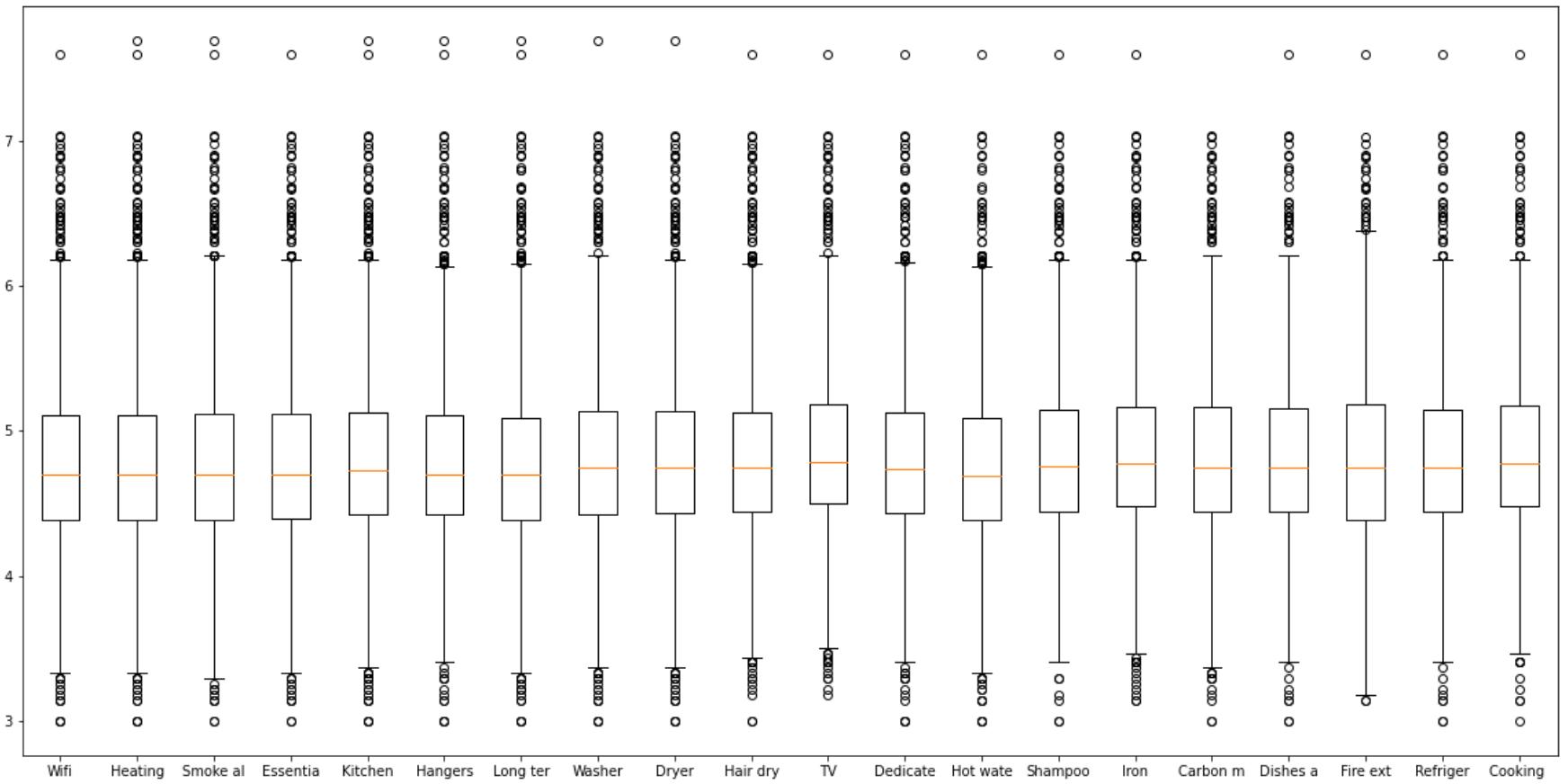
For categorical data, we can plot box plots for each of the prices

```
In [39]: amenities_prices = [ list() for a in fitted_amenities.vocabulary ]
for r in df.select("amenities_vector", "log_price").toLocalIterator():
    for idx in r[0].indices:
        amenities_prices[idx].append(r[1])

labels = [ label[:8] for label in fitted_amenities.vocabulary ]

plt.rcParams['figure.figsize'] = [20, 10]
plt.boxplot(amenities_prices, labels=labels)
plt
```

```
Out[39]: <module 'matplotlib.pyplot' from '/vol/scratch/virtualenv/tourism/lib/python3.7/site-packages/matplotlib/pyplot.py'>
```

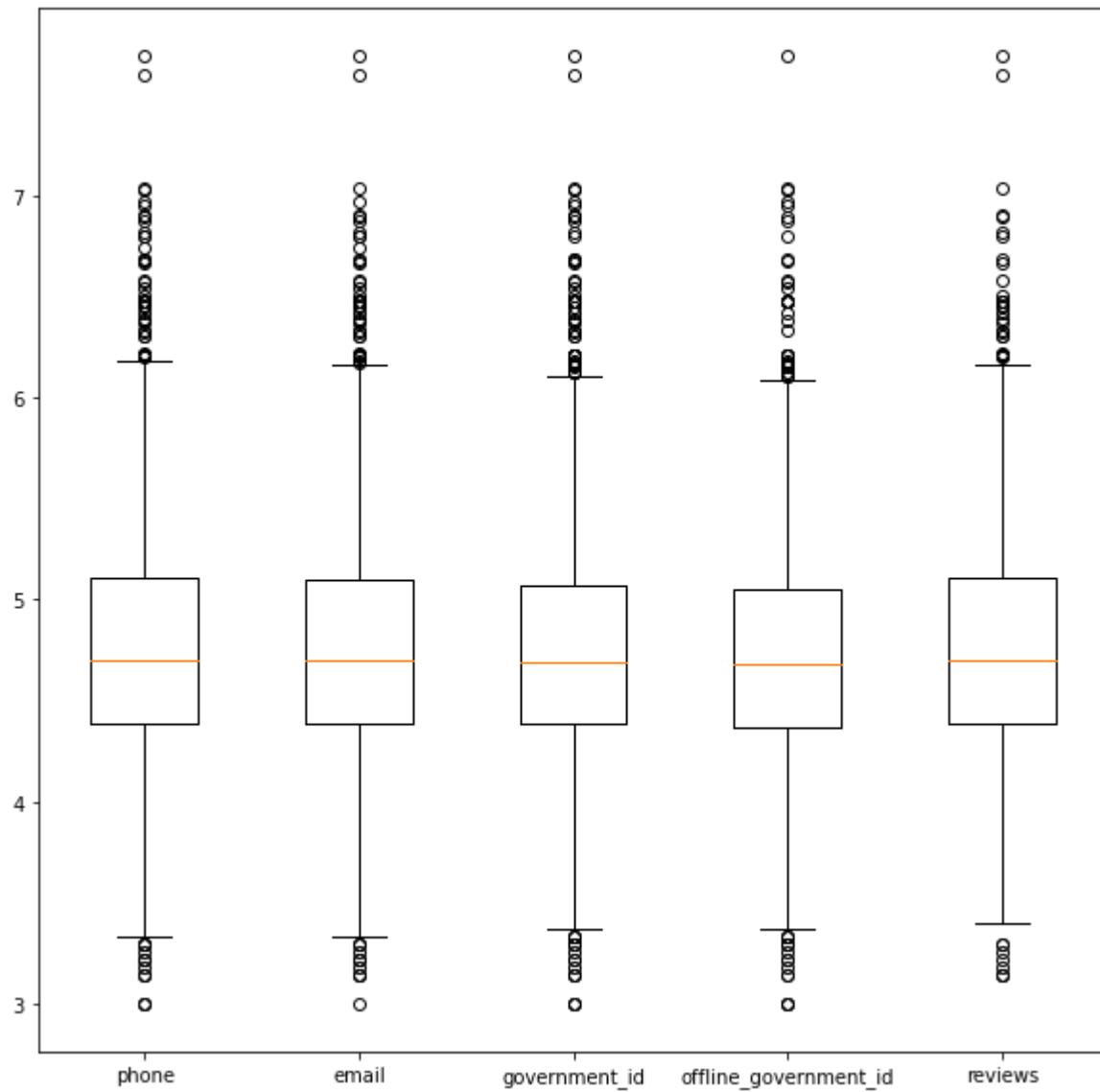


Having a TV pays better on average? Who would have thought.

```
In [40]: verification_prices = [ list() for a in fitted_verifications.vocabulary ]
for r in df.select("verifications_vector", "log_price").toLocalIterator():
    for idx in r[0].indices:
        verification_prices[idx].append(r[1])

plt.rcParams['figure.figsize'] = [10, 10]
plt.boxplot(verification_prices, labels=fitted_verifications.vocabulary)
plt
```

```
Out[40]: <module 'matplotlib.pyplot' from '/vol/scratch/virtualenv/tourism/lib/python3.7/site-packages/matplotlib/pyplot.py'>
```



No noticeable difference.

```
In [41]: n_prices = [ list() for a in fitted_n_indexer.labels ]
for r in df.select("neighbourhood_indexed", "log_price").toLocalIterator():
    n_prices[int(r[0])].append(r[1])

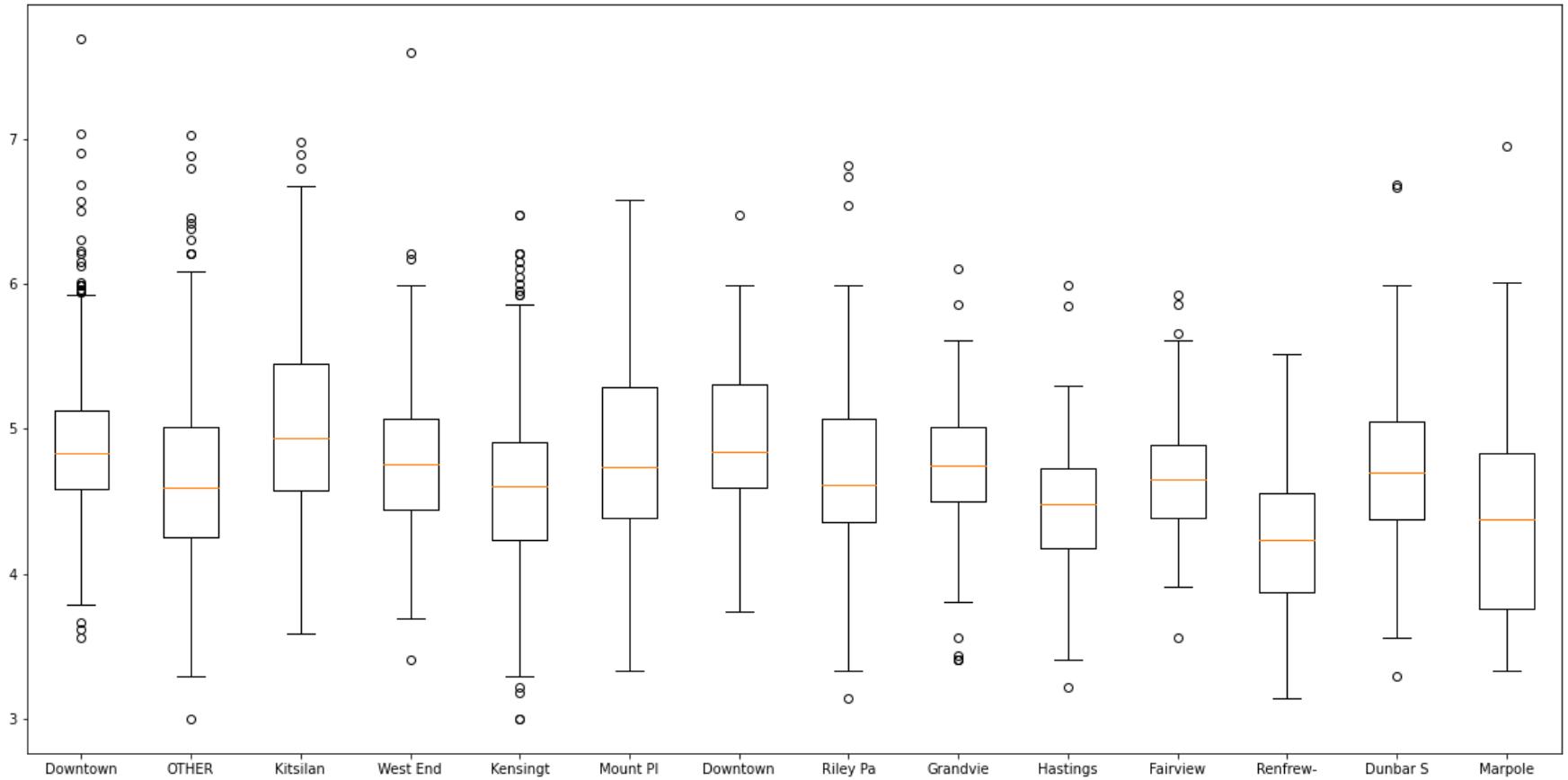
labels = [ label[:8] for label in fitted_n_indexer.labels ]
```

```

plt.rcParams['figure.figsize'] = [20, 10]
plt.boxplot(n_prices, labels=labels)
plt

```

Out[41]: <module 'matplotlib.pyplot' from '/vol/scratch/virtualenv/tourism/lib/python3.7/site-packages/matplotlib/pyplot.py'>



From here, the following features look good:

- `host_since`
- `host_listings_count`
- `host_total_listings_count`
- `accommodates`
- `bedrooms`
- `beds`

- minimum\_nights
- maximum\_nights
- minimum\_minimum\_nights
- maximum\_minimum\_nights
- minimum\_nights\_avg\_ntm
- availability\_30
- availability\_60
- availability\_90
- availability\_365
- calculated\_host\_listings\_count
- calculated\_host\_listings\_count\_entire\_homes
- calculated\_host\_listings\_count\_private\_rooms
- neighbourhood\_indexed
- property\_type\_indexed
- room\_type\_indexed

But `availability` cannot be computed for new properties, so we will not use it. Similarly with `host_since`.

```
In [42]: columns = [ "host_listings_count", "host_total_listings_count", "accommodates",
                 "bedrooms", "beds", "minimum_nights", "maximum_nights", "minimum_minimum_nights",
                 "maximum_minimum_nights", "minimum_nights_avg_ntm",
                 "calculated_host_listings_count",
                 "calculated_host_listings_count_entire_homes", "calculated_host_listings_count_private_rooms",
                 "neighbourhood_indexed", "property_indexed", "room_indexed" ]
```

## Imputation

Finally, we need to deal with undefined values for each of the selected columns. We will replace them with the *mode*, the most common value for that column.

```
In [43]: modes = { c: df.groupBy(c).\
               count().\
               sort("count", ascending=False).head()[c] for c in columns }
modes

{'host_listings_count': 1,
```

```
Out[43]: {'host_total_listings_count': 1,
'accommodates': 2,
'bedrooms': 1,
'beds': 1,
'minimum_nights': 30,
'maximum_nights': 1125,
'minimum_minimum_nights': 30,
'maximum_minimum_nights': 30,
'minimum_nights_avg_ntm': 30.0,
'calculated_host_listings_count': 1,
'calculated_host_listings_count_entire_homes': 1,
'calculated_host_listings_count_private_rooms': 0,
'neighbourhood_indexed': 0.0,
'property_indexed': 0.0,
'room_indexed': 0.0}
```

We can verify the code works as intended because the indexed columns return 0.0, as expected. We are now ready to impute. We will separate the imputers by type (integer vs. double).

```
In [44]: class Imputer(UnaryTransformer):

    def __init__(self, value, outType):
        super(UnaryTransformer, self).__init__()
        self.value = value
        self.outType = outType

    def createTransformFunc(self):
        return lambda x: self.value if x is None else x

    def outputDataType(self):
        return self.outType

    def validateInputType(self, inputType):
        assert inputType == self.outType, f'Expected {outType.typeName()} and found {inputType}'

    imp_columns = list()
    for c in columns:
        c_imp = c + "_imp"
        imp_columns.append(c_imp)
        imputer = Imputer(modes[c], df.schema[c].dataType).\
            setInputCol(c). \
            setOutputCol(c_imp)
        stages.append(imputer)
```

Now we re-execute the full-pipeline to obtain the imputed values.

```
In [45]: pipeline = Pipeline(stages=stages)
df = pipeline.fit(dataset).transform(dataset)
```

```
In [46]: print("base")
for c in columns:
    print(" ",c, df.schema[c].dataType.typeName(), df.filter(c + " is null").count())
print("imputed")
for c in imp_columns:
    print(" ",c, df.schema[c].dataType.typeName(), df.filter(c + " is null").count())
print("amenities_vector", df.filter("amenities_vector is null").count())
```

```
base
host_listings_count integer 1
host_total_listings_count integer 1
accommodates integer 0
bedrooms integer 151
beds integer 20
minimum_nights integer 0
maximum_nights integer 0
minimum_minimum_nights integer 0
maximum_minimum_nights integer 0
minimum_nights_avg_ntm double 0
calculated_host_listings_count integer 0
calculated_host_listings_count_entire_homes integer 0
calculated_host_listings_count_private_rooms integer 0
neighbourhood_indexed double 0
property_indexed double 0
room_indexed double 0
imputed
host_listings_count_imp integer 0
host_total_listings_count_imp integer 0
accommodates_imp integer 0
bedrooms_imp integer 0
beds_imp integer 0
minimum_nights_imp integer 0
maximum_nights_imp integer 0
minimum_minimum_nights_imp integer 0
maximum_minimum_nights_imp integer 0
minimum_nights_avg_ntm_imp double 0
calculated_host_listings_count_imp integer 0
calculated_host_listings_count_entire_homes_imp integer 0
calculated_host_listings_count_private_rooms_imp integer 0
neighbourhood_indexed_imp double 0
property_indexed_imp double 0
room_indexed_imp double 0
amenities_vector 0
```

We can see all columns have been correctly imputed.

```
In [47]: df.count()
```

```
Out[47]: 2167
```

To obtain a feature vector from the dataset, we use a vector assembler identifying the columns that make up the features. The `amenities_vector` column is concatenated into the output vector.

```
In [48]: assembler = VectorAssembler(  
    inputCols=imp_columns + ["amenities_vector"],  
    outputCol="features", handleInvalid="error")  
  
output = assembler.transform(df)  
output.count()
```

```
Out[48]: 2167
```

```
In [49]: len(next(output.toLocalIterator())['features'])
```

```
Out[49]: 36
```

```
In [50]: next(output.toLocalIterator())['features']
```

```
Out[50]: DenseVector([1.0, 1.0, 2.0, 1.0, 1.0, 30.0, 60.0, 30.0, 30.0, 30.0, 1.0, 1.0, 0.0, 3.0, 1.0, 0.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0])
```

From these feature vectors, we train a random forest.

```
In [51]: rf = RandomForestRegressor(featuresCol="features", labelCol='log_price', seed=42)  
  
model = rf.fit(output)
```

To test the trained model, we re-use all these feature transformations in a pipeline that we apply to the development test.

```
In [52]: pipeline = Pipeline(stages=stages + [assembler])  
df_devset = pipeline.fit(dataset).transform(devset)
```

```
predictions = model.transform(df_devset)

predictions.select("features", "log_price", "prediction").show(5)
```

```
+-----+-----+-----+
|    features|    log_price|    prediction|
+-----+-----+-----+
|[49.0,49.0,5.0,2....|5.0106352940962555|5.111937128072566|
|[1.0,1.0,4.0,1.0,...| 5.293304824724492|4.783042564532028|
|[5.0,5.0,6.0,3.0,...| 5.501258210544727|5.281162445096307|
|[1.0,1.0,2.0,1.0,...| 5.225746673713202|4.725892380368114|
|[1.0,1.0,2.0,1.0,...| 4.852030263919617|4.628450415150274|
+-----+-----+-----+
only showing top 5 rows
```

To evaluate it, we will use the `RegressionMetrics` functionality.

```
In [53]: metrics = RegressionMetrics(predictions.select("prediction", "log_price").rdd\
                                 .map(lambda r: (math.exp(r['prediction']), math.exp(r['log_price']))))
```

It computes a number of metrics, but we will focus on mean absolute error as it is easier to understand for practical applications. In our case, absolute error might not be as important as the positive errors (the times when the model said a property was worth more than it actually was).

```
In [54]: baseError = metrics.meanAbsoluteError
baseError
```

```
Out[54]: 56.83296858469796
```

```
In [55]: print("Average price", sum(map(lambda x:x['price'],
                                    df_devset.select("price").toLocalIterator())) / df_devset.count())
prices = [ p['price'] for p in df_devset.select("price").toLocalIterator() ]
prices = sorted(prices)
print("Median price", prices[len(prices)// 2])
```

```
Average price 150.7699704142012
Median price 115
```

So the current model put us about 50 dollars from the actual price, which is an error between 30% to 50% of the actual price. It is a poor model, but it is a start. Let us see which features are better.

# Error Analysis

Let us reassemble the labels for our feature vector.

```
In [56]: labels = columns + list(map(lambda x: "amenity: " + x, fitted_amenities.vocabulary))
labels
```

```
Out[56]: ['host_listings_count',
 'host_total_listings_count',
 'accommodates',
 'bedrooms',
 'beds',
 'minimum_nights',
 'maximum_nights',
 'minimum_minimum_nights',
 'maximum_minimum_nights',
 'minimum_nights_avg_ntm',
 'calculated_host_listings_count',
 'calculated_host_listings_count_entire_homes',
 'calculated_host_listings_count_private_rooms',
 'neighbourhood_indexed',
 'property_indexed',
 'room_indexed',
 'amenity: Wifi',
 'amenity: Heating',
 'amenity: Smoke alarm',
 'amenity: Essentials',
 'amenity: Kitchen',
 'amenity: Hangers',
 'amenity: Long term stays allowed',
 'amenity: Washer',
 'amenity: Dryer',
 'amenity: Hair dryer',
 'amenity: TV',
 'amenity: Dedicated workspace',
 'amenity: Hot water',
 'amenity: Shampoo',
 'amenity: Iron',
 'amenity: Carbon monoxide alarm',
 'amenity: Dishes and silverware',
 'amenity: Fire extinguisher',
 'amenity: Refrigerator',
 'amenity: Cooking basics']
```

We can now check the random forest feature importance.

```
In [57]: importances = [ (model.featureImportances[idx], lbl) for idx, lbl in enumerate(labels) ]
table = '<table><tr><th>Rank</th><th>Feature</th><th>Importance</th></tr>'
for idx, pair in enumerate(sorted(importances, reverse=True)):
    score, lbl = pair
    table = '{}<tr><td>{}</td><td>{}</td><td style="text-align: left">{}</td></tr>'.format(table, idx + 1, l
table += '</table>'
display(HTML(table))
```

Rank	Feature	Importance
1	bedrooms	0.29759833711831807
2	accommodates	0.1427191216188187
3	room_indexed	0.1127149138402227
4	calculated_host_listings_count_private_rooms	0.10739723134374748
5	calculated_host_listings_count_entire_homes	0.08297496298387186
6	beds	0.05974627314563132
7	property_indexed	0.04717241092082373
8	neighbourhood_indexed	0.028542794641018582
9	minimum_nights	0.02128008411329211
10	minimum_minimum_nights	0.015979070148242725
11	calculated_host_listings_count	0.013996832881259188
12	host_listings_count	0.010204820776045778
13	maximum_minimum_nights	0.010034851731445702
14	amenity: TV	0.007056027176559329
15	minimum_nights_avg_ntm	0.006005886468711853
16	amenity: Washer	0.004455509972657118
17	maximum_nights	0.004358285051469576
18	host_total_listings_count	0.0037251114201160987
19	amenity: Shampoo	0.0036793946167604113
20	amenity: Wifi	0.0029486516717849845
21	amenity: Kitchen	0.0025464909525526004
22	amenity: Dryer	0.0022176197867234603

```
23     amenity: Dedicated workspace 0.002035125243326297
24     amenity: Fire extinguisher 0.001780232816892939
25             amenity: Iron 0.0015979303521886784
26             amenity: Essentials 0.0013465241889189868
27             amenity: Hair dryer 0.0010627095723940202
28             amenity: Heating 0.001036165720235597
29     amenity: Carbon monoxide alarm 0.0009801199944787862
30     amenity: Long term stays allowed 0.0007968870266094076
31             amenity: Hangers 0.0007259039580038782
32             amenity: Dishes and silverware 0.0004421557326424239
33             amenity: Hot water 0.0004196893223580955
34             amenity: Cooking basics 0.000379539732620414
35             amenity: Refrigerator 4.233395925725329e-05
36             amenity: Smoke alarm 0.0
```

We can see that many amenities are not important for price prediction. It might be because they are expected amenities (like "Dishes and silverware") or not important for the type of tourism received by Vancouver (e.g., "Dedicated workspace").

## Feature selection: dropping amenities

We can keep the only two amenities that seem to matter: TV and Washer by dropping the processing of amenities as Splitter and CountVectorizer and instead using a spotter, checking whether the original amenities string contains "TV" and "Washer" to produce the two binary features.

It is also a good moment to clean the pipeline.

In [58]:

```
for idx, stage in enumerate(stages):
    print(idx, stage)
```

```
0 SetReducer_d4e90a4928ef
1 SetReducer_fdb3aa2d1611
2 SetReducer_9b8d74831de8
3 StringIndexerModel: uid=StringIndexer_fedb0e03e5b0, handleInvalid=error
4 StringIndexerModel: uid=StringIndexer_71a68c6215ef, handleInvalid=error
```

```
5 StringIndexerModel: uid=StringIndexer_9674b3369a79, handleInvalid=error
6 FieldSplitter_0973803c0e86
7 FieldSplitter_205b09a44f11
8 CountVectorizerModel: uid=CountVectorizer_5b0b341843f6, vocabularySize=20
9 CountVectorizerModel: uid=CountVectorizer_f09d4b4e533b, vocabularySize=5
10 YearKeeper_b15b32aa2d70
11 LogTransformer_83faf0c5abad
12 Imputer_898eaf6d3704
13 Imputer_b38379aacf8a
14 Imputer_2afe48a04152
15 Imputer_fee8f85f02c3
16 Imputer_865441ae3c00
17 Imputer_97a253cf5ce
18 Imputer_a2f443143626
19 Imputer_2db1cb9eb8b2
20 Imputer_7f79426d3dc4
21 Imputer_67ef1037122c
22 Imputer_8298bac13143
23 Imputer_f6ba0346417e
24 Imputer_b8d8335acd2a
25 Imputer_76a7c1176fb9
26 Imputer_52a10b28c346
27 Imputer_c5680f76c06e
```

In [59]:

```
new_stages = stages[0:6] + stages[11:]
for idx, stage in enumerate(new_stages):
    print(idx, stage)
```

```
0 SetReducer_d4e90a4928ef
1 SetReducer_fdb3aa2d1611
2 SetReducer_9b8d74831de8
3 StringIndexerModel: uid=StringIndexer_fedb0e03e5b0, handleInvalid=error
4 StringIndexerModel: uid=StringIndexer_71a68c6215ef, handleInvalid=error
5 StringIndexerModel: uid=StringIndexer_9674b3369a79, handleInvalid=error
6 LogTransformer_83faf0c5abad
7 Imputer_898eaf6d3704
8 Imputer_b38379aacf8a
9 Imputer_2afe48a04152
10 Imputer_fee8f85f02c3
11 Imputer_865441ae3c00
12 Imputer_97a253cf5ce
13 Imputer_a2f443143626
14 Imputer_2db1cb9eb8b2
15 Imputer_7f79426d3dc4
16 Imputer_67ef1037122c
17 Imputer_8298bac13143
18 Imputer_f6ba0346417e
19 Imputer_b8d8335acd2a
```

```
20 Imputer_76a7c1176fb9
21 Imputer_52a10b28c346
22 Imputer_c5680f76c06e
```

In [60]:

```
class AmenitySpotter(UnaryTransformer):
    def __init__(self, amenity):
        super(UnaryTransformer, self).__init__()
        self.amenity = amenity

    def createTransformFunc(self):
        return lambda x: self.amenity in x

    def outputDataType(self):
        return BooleanType()

    def validateInputType(self, inputType):
        assert inputType == StringType(), f'Expected StringType() and found {inputType}'

tv_spotter = AmenitySpotter("TV").\
    setInputCol("amenities"). \
    setOutputCol("has_tv")
washer_spotter = AmenitySpotter("Washer").\
    setInputCol("amenities"). \
    setOutputCol("has_washer")
new_stages.append(tv_spotter)
new_stages.append(washer_spotter)

tv_spotter.transform(df).show(vertical=True, truncate=False)
```

-RECORD 0-----

id	13358
host_since	2009/11/07
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.71
host_acceptance_rate	0.71
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1

host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'offl
ine_government_id', 'selfie', 'government_id']	f
host_has_profile_pic	t
host_identity_verified	null
neighbourhood	West End
neighbourhood_cleansed	null
neighbourhood_group_cleansed	49.28209
latitude	-123.12515
longitude	Entire condominium
property_type	Entire home/apt
room_type	2
accommodates	null
bathrooms	1 bath
bathrooms_text	1
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Gym', 'Paid parking off premises', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Extra pillows and blankets', 'Dishwasher', 'Cooking basics', 'Hot water kettle', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning', 'Elevator']
price	90
minimum_nights	30
maximum_nights	60
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	11
availability_60	41
availability_90	70
availability_365	70
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	West End
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	3.0
property_indexed	1.0
room_indexed	0.0
amenities_array	[Kitchen, Oven, Gym, Paid parking off premises, Microwav

e, Wifi, Dryer, Carbon monoxide alarm, Stove, Hot water, Extra pillows and blankets, Dishwasher, Cooking basics, Hot water kettle, Smoke alarm, Heating, Single level home, Hair dryer, Dedicated workspace, Iron, Coffee maker, Bed linens, Shampoo, Dishes and silverware, Hangers, Cable TV, Refrigerator, Essentials, Washer, Long term stays allowed, TV, Air conditioning, Elevator]

verifications_array	[email, phone, facebook, reviews, jumio, offline_government_id, selfie, government_id]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,18,19],[1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,3,4],[1.0,1.0,1.0,1.0,1.0])
since_year	2009
log_price	4.499809670330265
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	2
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	30
maximum_nights_imp	60
minimum_minimum_nights_imp	30
maximum_minimum_nights_imp	30
minimum_nights_avg_ntm_imp	30.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	3.0
property_indexed_imp	1.0
room_indexed_imp	0.0
has_tv	true

-RECORD 1-----

-----

-----

-----

-----

-----

-----

-----

id	16254
host_since	2009/12/15
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Hastings-Sunrise
host_listings_count	1
host_total_listings_count	1
host_verifications	['phone', 'facebook', 'offline_government_id', 'selfie', 'government_id', 'identity_manual']
host_has_profile_pic	t

host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Hastings-Sunrise
neighbourhood_group_cleansed	null
latitude	49.27734
longitude	-123.04152
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Hair dryer', 'Lockbox', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Children\u2019s books and toys', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib']
price	195
minimum_nights	3
maximum_nights	31
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	228
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Hastings-Sunrise
property_reduced	Entire guest suite
room_reduced	Entire home/apt
neighbourhood_indexed	9.0
property_indexed	4.0
room_indexed	0.0
amenities_array	[Kitchen, Oven, Microwave, Wifi, Dryer, Carbon monoxide alarm, Stove, Hot water, Extra pillows and blankets, Luggage dropoff allowed, Cooking basics, Private entrance, Smoke alarm, Hair dryer, Lockbox, Dedicated workspace, Iron, Free street parking, Free parking on premises, Coffee maker, Bed linens, Shampoo, Dishes and silverware, Fire extinguisher, Patio or balcony, Children\u2019s books and toys, Hangers, Refrigerator, Essentials, Washer, Long term stays allowed, Pack \u2019n Pla

```

y/travel_crib]
 verifications_array | [phone, facebook, offline_government_id, selfie, governm
ent_id, identity_manual] | ent_id, identity_manual] | ent_id, identity_manual]
 amenities_vector | (20,[0,2,3,4,5,6,7,8,9,11,12,13,14,15,16,17,18,19],[1.0,
1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
 verifications_vector | (5,[0,2,3],[1.0,1.0,1.0])
 since_year | 2009
 log_price | 5.272999558563747
 host_listings_count_imp | 1
 host_total_listings_count_imp | 1
 accommodates_imp | 4
 bedrooms_imp | 2
 beds_imp | 3
 minimum_nights_imp | 3
 maximum_nights_imp | 31
 minimum_minimum_nights_imp | 3
 maximum_minimum_nights_imp | 3
 minimum_nights_avg_ntm_imp | 3.0
 calculated_host_listings_count_imp | 1
 calculated_host_listings_count_entire_homes_imp | 1
 calculated_host_listings_count_private_rooms_imp | 0
 neighbourhood_indexed_imp | 9.0
 property_indexed_imp | 4.0
 room_indexed_imp | 0.0
 has_tv | false

```

-RECORD 2-----

-----

-----

-----

-----

-----

id	17765
host_since	2010/01/07
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Mount Pleasant
host_listings_count	1
host_total_listings_count	1
host_verifications	['phone', 'facebook', 'reviews', 'jumio', 'offline_gover nment_id', 'selfie', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Mount Pleasant

neighbourhood_group_cleansed	null
latitude	49.26181
longitude	-123.10905
property_type	Entire apartment
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Essentials', 'Washer', 'Long term stays allowed', 'Elevator']
price	94
minimum_nights	3
maximum_nights	60
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Mount Pleasant
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	5.0
property_indexed	0.0
room_indexed	0.0
amenities_array	['Kitchen', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Essentials', 'Washer', 'Long term stays allowed', 'Elevator']
verifications_array	[phone, facebook, reviews, jumio, offline_government_id, selfie, government_id]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,11,12,13,14,15,16,17],[1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,2,3,4],[1.0,1.0,1.0,1.0])

since_year	2010
log_price	4.543294782270004
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	2
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	3
maximum_nights_imp	60
minimum_minimum_nights_imp	3
maximum_minimum_nights_imp	3
minimum_nights_avg_ntm_imp	3.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	5.0
property_indexed_imp	0.0
room_indexed_imp	0.0
has_tv	false
-RECORD 3-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
id	18795
host_since	2010/01/13
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.7
host_acceptance_rate	0.4
host_is_superhost	f
host_neighbourhood	West End
host_listings_count	3
host_total_listings_count	3
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	West End
neighbourhood_group_cleansed	null
latitude	49.28251
longitude	-123.12827
property_type	Private room in house
room_type	Private room
accommodates	2
bathrooms	null

bathrooms_text	1 private bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Cable TV', 'Wifi', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Long term stays allowed']
price	50
minimum_nights	30
maximum_nights	360
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	360
maximum_maximum_nights	360
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	360.0
has_availability	t
availability_30	9
availability_60	20
availability_90	50
availability_365	325
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	3
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	West End
property_reduced	Private room in house
room_reduced	Private room
neighbourhood_indexed	3.0
property_indexed	3.0
room_indexed	1.0
amenities_array	[Kitchen, Cable TV, Wifi, Essentials, Heating, Washer, Dryer, Long term stays allowed]
verifications_array	[email, phone, reviews, jumio, government_id]
amenities_vector	(20,[0,1,3,4,6,7,8],[1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,4],[1.0,1.0,1.0,1.0])
since_year	2010
log_price	3.912023005428146
host_listings_count_imp	3
host_total_listings_count_imp	3
accommodates_imp	2
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	30
maximum_nights_imp	360
minimum_minimum_nights_imp	30
maximum_minimum_nights_imp	30
minimum_nights_avg_ntm_imp	30.0
calculated_host_listings_count_imp	3
calculated_host_listings_count_entire_homes_imp	0

calculated_host_listings_count_private_rooms_imp	3
neighbourhood_indexed_imp	3.0
property_indexed_imp	3.0
room_indexed_imp	1.0
has_tv	true
-RECORD 4-----	
-----	
-----	
id	21913
host_since	2010/02/22
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	t
host_neighbourhood	Renfrew-Collingwood
host_listings_count	3
host_total_listings_count	3
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'selfie', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Renfrew-Collingwood
neighbourhood_group_cleansed	null
latitude	49.23427
longitude	-123.05309
property_type	Entire house
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Luggage dropoff allowed', 'Private entrance', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Bed linens', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV']
price	80
minimum_nights	28
maximum_nights	400
minimum_minimum_nights	28
maximum_minimum_nights	28

minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	28.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	2
availability_60	13
availability_90	43
availability_365	318
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Renfrew-Collingwood
property_reduced	Entire house
room_reduced	Entire home/apt
neighbourhood_indexed	11.0
property_indexed	2.0
room_indexed	0.0
amenities_array	[Kitchen, Oven, Microwave, Wifi, Dryer, Carbon monoxide alarm, Stove, Hot water, Luggage dropoff allowed, Private entrance, Smoke alarm, Heating, Single level hom e, Hair dryer, Dedicated workspace, Iron, Free street parking, Free parking on premises, Coffee maker, Bed l inens, Keypad, Shampoo, Dishes and silverware, Fire extinguisher, Hangers, Cable TV, Refrigerator, Essential s, Washer, Long term stays allowed, TV]
verifications_array	[email, phone, reviews, offline_government_id, selfie, g overnment_id]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18],[1. 0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,3,4],[1.0,1.0,1.0,1.0,1.0])
since_year	2010
log_price	4.382026634673881
host_listings_count_imp	3
host_total_listings_count_imp	3
accommodates_imp	2
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	28
maximum_nights_imp	400
minimum_minimum_nights_imp	28
maximum_minimum_nights_imp	28
minimum_nights_avg_ntm_imp	28.0
calculated_host_listings_count_imp	3
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	2
neighbourhood_indexed_imp	11.0
property_indexed_imp	2.0
room_indexed_imp	0.0
has_tv	true

-RECORD 5-----

id	24273
host_since	2011/10/09
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	0.82
host_is_superhost	f
host_neighbourhood	Kitsilano
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'jumio', 'offline_governme
nt_id', 'government_id']	
host_has_profile_pic	f
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Kitsilano
neighbourhood_group_cleansed	null
latitude	49.2626
longitude	-123.17308
property_type	Entire apartment
room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wi fi', 'Dryer', 'Fireplace guards', 'Carbon monoxide alarm', 'Stove', 'Crib', 'Hot water', 'Babysitter recommendations', 'Garden or backyard', 'Extra pillows and blankets', 'Dishwasher', 'Luggage dropoff allowed', 'Cooking basics', 'Room-darkening shades', 'Private entrance', 'Smoke alarm', 'Baking sheet', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bathtub', 'Coffee maker', 'Bed linens', 'Keypad', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Shower gel', 'Patio or balcony', 'Children\u2019s books and toys', 'High chair', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib', 'TV', 'Ethernet connection']
price	200
minimum_nights	30
maximum_nights	365
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	365
maximum_maximum_nights	365

minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	0
availability_90	10
availability_365	223
instant_bookable	f
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Kitsilano
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	2.0
property_indexed	0.0
room_indexed	0.0
amenities_array	[Kitchen, Oven, Indoor fireplace, Microwave, Wifi, Dryer, Fireplace guards, Carbon monoxide alarm, Stove, Crib, Hot water, Babysitter recommendations, Garden or backyard, Extra pillows and blankets, Dishwasher, Luggage dropoff allowed, Cooking basics, Room-darkening shades, Private entrance, Smoke alarm, Baking sheet, Heating, Single level home, Hair dryer, Dedicated workspace, Iron, Free street parking, Bathtub, Coffee maker, Bed linens, Keypad, Shampoo, Fire extinguisher, Dishes and silverware, Shower gel, Patio or balcony, Children's books and toys, High chair, Hangers, Cable TV, Refrigerator, Essentials, Washer, Long term stays allowed, Pack n Play/travel crib, TV, Ethernet connection]
verifications_array	[email, phone, reviews, jumio, offline_government_id, government_id]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19],[1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,3,4],[1.0,1.0,1.0,1.0,1.0])
since_year	2011
log_price	5.298317366548036
host_listings_count_imp	2
host_total_listings_count_imp	2
accommodates_imp	6
bedrooms_imp	2
beds_imp	3
minimum_nights_imp	30
maximum_nights_imp	365
minimum_minimum_nights_imp	30
maximum_minimum_nights_imp	30
minimum_nights_avg_ntm_imp	30.0
calculated_host_listings_count_imp	2
calculated_host_listings_count_entire_homes_imp	2
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	2.0
property_indexed_imp	0.0
room_indexed_imp	0.0

has_tv	true
-RECORD 6-----	
-----	
id	42645
host_since	2010/04/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	4
host_total_listings_count	4
host_verifications	['email', 'phone', 'facebook', 'reviews']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.28001
longitude	-123.12475
property_type	Entire condominium
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Oven', 'Paid parking on premises', 'Paid parking off premises', 'Gym', 'Microwave', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Luggage dropoff allowed', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Coffee maker', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Patio or balcony', 'Children\u2019s books and toys', 'High chair', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib', 'TV', 'Elevator']
price	159
minimum_nights	32
maximum_nights	365
minimum_minimum_nights	32
maximum_minimum_nights	32
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	32.0

maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	29
availability_90	59
availability_365	333
instant_bookable	t
calculated_host_listings_count	4
calculated_host_listings_count_entire_homes	4
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	1.0
room_indexed	0.0
amenities_array	[Kitchen, Oven, Paid parking on premises, Paid parking o ff premises, Gym, Microwave, Wifi, Host greets you, Dryer, Carbon monoxide alarm, Stove, Hot water, Dishwash er, Luggage dropoff allowed, Cooking basics, Smoke alarm, Heating, Hair dryer, Dedicated workspace, First ai d kit, Iron, Coffee maker, Shampoo, Fire extinguisher, Dishes and silverware, Patio or balcony, Children\u2019s books and toys, High chair, Hangers, Cable TV, Refrigerator, Essentials, Washer, Long term stays allowe d, Pack \u2019n Play/travel crib, TV, Elevator]
verifications_array	[email, phone, facebook, reviews]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19], [1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,4],[1.0,1.0,1.0])
since_year	2010
log_price	5.0689042022202315
host_listings_count_imp	4
host_total_listings_count_imp	4
accommodates_imp	3
bedrooms_imp	1
beds_imp	2
minimum_nights_imp	32
maximum_nights_imp	365
minimum_minimum_nights_imp	32
maximum_minimum_nights_imp	32
minimum_nights_avg_ntm_imp	32.0
calculated_host_listings_count_imp	4
calculated_host_listings_count_entire_homes_imp	4
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	0.0
property_indexed_imp	1.0
room_indexed_imp	0.0
has_tv	true

-RECORD 7-----

id	54261
host_since	2010/10/05
host_location	Vancouver, British Columbia, Canada
host_response_time	a few days or more
host_response_rate	0
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Downtown Vancouver
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'selfie', 'government_id', 'identity_manual']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27655
longitude	-123.12485
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot tub', 'Gym', 'Indoor fireplace', 'Wi-Fi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free parking on premises', 'Shampoo', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning', 'Elevator']
price	126
minimum_nights	90
maximum_nights	365
minimum_minimum_nights	90
maximum_minimum_nights	90
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90

availability_365	365
instant_bookable	f
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	1.0
room_indexed	0.0
amenities_array	[Kitchen, Hot tub, Gym, Indoor fireplace, Wifi, Host greets you, Dryer, Carbon monoxide alarm, Hot water, Luggage dropoff allowed, Smoke alarm, Heating, Hair dryer, Dedicated workspace, Iron, Free parking on premises, Shampoo, Fire extinguisher, Hangers, Cable TV, Essentials, Washer, Long term stays allowed, TV, Air conditioning, Elevator]
verifications_array	[email, phone, reviews, offline_government_id, selfie, government_id, identity_manual]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,17],[1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,3,4],[1.0,1.0,1.0,1.0,1.0])
since_year	2010
log_price	4.836281906951478
host_listings_count_imp	2
host_total_listings_count_imp	2
accommodates_imp	4
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	90
maximum_nights_imp	365
minimum_minimum_nights_imp	90
maximum_minimum_nights_imp	90
minimum_nights_avg_ntm_imp	90.0
calculated_host_listings_count_imp	2
calculated_host_listings_count_entire_homes_imp	2
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	0.0
property_indexed_imp	1.0
room_indexed_imp	0.0
has_tv	true

-RECORD 8-

host_since	2011/02/03
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Commercial Drive
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.27357
longitude	-123.07024
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	['Kitchen', 'Lake access', 'Oven', 'Paid parking off premises', 'Gym', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'BBQ grill', 'TV', 'Elevator']
price	210
minimum_nights	7
maximum_nights	21
minimum_minimum_nights	7
maximum_minimum_nights	7
minimum_maximum_nights	21
maximum_maximum_nights	21
minimum_nights_avg_ntm	7.0
maximum_nights_avg_ntm	21.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	40
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0

neighbourhood_reduced	Grandview-Woodland
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	8.0
property_indexed	1.0
room_indexed	0.0
amenities_array	[Kitchen, Lake access, Oven, Paid parking off premises, Gym, Indoor fireplace, Microwave, Wifi, Dryer, Carbon monoxide alarm, Stove, Hot water, Dishwasher, Extra pillows and blankets, Luggage dropoff allowed, Cooking basics, Smoke alarm, Heating, Single level home, Hair dryer, Dedicated workspace, Iron, Free street parking, Coffee maker, Bed linens, Shampoo, Dishes and silverware, Fire extinguisher, Patio or balcony, Hangers, Refrigerator, Essentials, Washer, BBQ grill, TV, Elevator]
verifications_array	[email, phone, reviews, jumio, government_id]
amenities_vector	(20,[0,1,2,3,4,5,7,8,9,10,11,12,13,14,15,16,17,18,19], [1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,4],[1.0,1.0,1.0,1.0,1.0])
since_year	2011
log_price	5.3471075307174685
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	4
bedrooms_imp	2
beds_imp	2
minimum_nights_imp	7
maximum_nights_imp	21
minimum_minimum_nights_imp	7
maximum_minimum_nights_imp	7
minimum_nights_avg_ntm_imp	7.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	8.0
property_indexed_imp	1.0
room_indexed_imp	0.0
has_tv	true

-RECORD 9-----

-----

-----

-----

-----

-----

id	77157
host_since	2011/02/27
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	1

host_is_superhost	f
host_neighbourhood	Arbutus Ridge
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'offl
ine_government_id', 'government_id']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Arbutus Ridge
neighbourhood_group_cleansed	null
latitude	49.24675
longitude	-123.16711
property_type	Private room in guest suite
room_type	Private room
accommodates	3
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Microwave', 'Wifi', 'Laundromat nearby', 'Dryer', 'Hot water', 'Garden or backyard', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Heating', 'Mini fridge', 'Single level home', 'Hair dryer', 'Lockbox', 'Dedicated workspace', 'First aid kit', 'Iron', 'Body soap', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Barbecue utensils', 'Shower gel', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Conditioner', 'BBQ grill', 'Beach essentials', 'TV', 'Long term stays allowed']
price	75
minimum_nights	3
maximum_nights	60
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	3
availability_60	3
availability_90	3
availability_365	267
instant_bookable	t
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	OTHER
property_reduced	OTHER
room_reduced	Private room

neighbourhood_indexed	1.0
property_indexed	5.0
room_indexed	1.0
amenities_array	[Kitchen, Microwave, Wifi, Laundromat nearby, Dryer, Hot water, Garden or backyard, Extra pillows and blankets, Luggage dropoff allowed, Cooking basics, Private entrance, Smoke alarm, Heating, Mini fridge, Single level home, Hair dryer, Lockbox, Dedicated workspace, First aid kit, Iron, Body soap, Free street parking, Coffee maker, Bed linens, Shampoo, Fire extinguisher, Dishes and silverware, Barbecue utensils, Shower gel, Hangers, Cable TV, Essentials, Washer, Conditioner, BBQ grill, Beach essentials, TV, Long term stays allowed]
verifications_array	[email, phone, facebook, reviews, jumio, offline_governm
ent_id, government_id]	
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18],[1.0, 1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,3,4],[1.0,1.0,1.0,1.0,1.0])
since_year	2011
log_price	4.31748811353631
host_listings_count_imp	2
host_total_listings_count_imp	2
accommodates_imp	3
bedrooms_imp	1
beds_imp	2
minimum_nights_imp	3
maximum_nights_imp	60
minimum_minimum_nights_imp	3
maximum_minimum_nights_imp	3
minimum_nights_avg_ntm_imp	3.0
calculated_host_listings_count_imp	2
calculated_host_listings_count_entire_homes_imp	0
calculated_host_listings_count_private_rooms_imp	2
neighbourhood_indexed_imp	1.0
property_indexed_imp	5.0
room_indexed_imp	1.0
has_tv	true

id	111077
host_since	2011/05/09
host_location	North Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0.33
host_is_superhost	f
host_neighbourhood	Grandview-Woodland

host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'gove
rnment_id']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.26726
longitude	-123.05969
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	['Kitchen', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Stove', 'Hot water', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Heating', 'Hair dryer', 'Iron', 'Free street parking', 'Coffee maker', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed']
price	125
minimum_nights	3
maximum_nights	365
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	4
availability_60	34
availability_90	64
availability_365	339
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Grandview-Woodland
property_reduced	Entire guest suite
room_reduced	Entire home/apt
neighbourhood_indexed	8.0
property_indexed	4.0
room_indexed	0.0
amenities_array	[Kitchen, Indoor fireplace, Microwave, Wifi, Dryer, Stove, Hot water, Cooking basics, Private entrance, Smoke alarm, Heating, Hair dryer, Iron, Free street parking,

```
Coffee maker, Keypad, Shampoo, Dishes and silverware, Fire extinguisher, Hangers, Refrigerator, Essentials,  
Washer, Long term stays allowed]  
verifications_array | [email, phone, facebook, reviews, jumio, government_id]  
amenities_vector | (20,[0,1,2,3,4,5,6,7,8,9,12,13,14,16,17,18,19],[1.0,1.0,  
1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])  
verifications_vector | (5,[0,1,2,4],[1.0,1.0,1.0,1.0])  
since_year | 2011  
log_price | 4.8283137373023015  
host_listings_count_imp | 1  
host_total_listings_count_imp | 1  
accommodates_imp | 3  
bedrooms_imp | 2  
beds_imp | 2  
minimum_nights_imp | 3  
maximum_nights_imp | 365  
minimum_minimum_nights_imp | 3  
maximum_minimum_nights_imp | 3  
minimum_nights_avg_ntm_imp | 3.0  
calculated_host_listings_count_imp | 1  
calculated_host_listings_count_entire_homes_imp | 1  
calculated_host_listings_count_private_rooms_imp | 0  
neighbourhood_indexed_imp | 8.0  
property_indexed_imp | 4.0  
room_indexed_imp | 0.0  
has_tv | false  
-RECORD 11-----
```

id	125176
host_since	2011/05/24
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Riley Park
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'offline_gover
overnment_id', 'government_id', 'work_email']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Riley Park

neighbourhood_group_cleansed	null
latitude	49.24648
longitude	-123.09241
property_type	Private room in house
room_type	Private room
accommodates	3
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	0
amenities	['Kitchen', 'Hot tub', 'Oven', 'Wifi', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Garden or backyard', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bathtub', 'Free parking on premises', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Patio or balcony', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Long term stays allowed', 'TV']
price	75
minimum_nights	2
maximum_nights	60
minimum_minimum_nights	2
maximum_minimum_nights	2
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	2.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	2
availability_365	268
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	1
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Riley Park
property_reduced	Private room in house
room_reduced	Private room
neighbourhood_indexed	7.0
property_indexed	3.0
room_indexed	1.0
amenities_array	['Kitchen', 'Hot tub', 'Oven', 'Wifi', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Garden or backyard', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bathtub', 'Free parking on premises', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Patio or balcony', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Long term stays allowed', 'TV']
verifications_array	[email, phone, facebook, reviews, offline_government_id, government_id, work_email]
amenities_vector	(20,[0,1,2,3,4,5,6,9,10,11,12,13,14,15,16,18,19],[1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,3,4],[1.0,1.0,1.0,1.0,1.0])



bathrooms	null
bathrooms_text	1 shared bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot water', 'Paid parking on premises', 'Lock on bedroom door', 'Free street parking', 'Cable TV', 'Smoke alarm', 'Wifi', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Carbon monoxide alarm', 'Dishes and silverware', 'TV', 'Long term stays allowed', 'Host greets you', 'Hair dryer', 'Shampoo', 'Fire extinguisher']
price	45
minimum_nights	30
maximum_nights	280
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	280
maximum_maximum_nights	280
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	280.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	1
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Renfrew-Collingwood
property_reduced	Private room in house
room_reduced	Private room
neighbourhood_indexed	11.0
property_indexed	3.0
room_indexed	1.0
amenities_array	[Kitchen, Hot water, Paid parking on premises, Lock on bedroom door, Free street parking, Cable TV, Smoke alarm, Wifi, Essentials, Heating, Washer, Dryer, Carbon monoxide alarm, Dishes and silverware, TV, Long term stays allowed, Host greets you, Hair dryer, Shampoo, Fire extinguisher]
verifications_array	[email, phone, reviews, jumio, offline_government_id, government_id]
amenities_vector	(20,[0,1,2,3,4,6,7,8,9,10,12,13,15,16,17],[1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,3,4],[1.0,1.0,1.0,1.0,1.0])
since_year	2011
log_price	3.8066624897703196
host_listings_count_imp	2
host_total_listings_count_imp	2
accommodates_imp	1
bedrooms_imp	1
beds_imp	1

minimum_nights_imp	30
maximum_nights_imp	280
minimum_minimum_nights_imp	30
maximum_minimum_nights_imp	30
minimum_nights_avg_ntm_imp	30.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	0
calculated_host_listings_count_private_rooms_imp	1
neighbourhood_indexed_imp	11.0
property_indexed_imp	3.0
room_indexed_imp	1.0
has_tv	true
-RECORD 13-	
-----	
-----	
-----	
-----	
-----	
id	174135
host_since	2011/07/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Downtown Eastside
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'selfie', 'government_id', 'identity_manual']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown Eastside
neighbourhood_group_cleansed	null
latitude	49.27782
longitude	-123.08985
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Private entrance', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Hangers', 'Cable T

V', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning']	
price	100
minimum_nights	30
maximum_nights	365
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	224
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown Eastside
property_reduced	Entire guest suite
room_reduced	Entire home/apt
neighbourhood_indexed	6.0
property_indexed	4.0
room_indexed	0.0
amenities_array	[Kitchen, Wifi, Dryer, Carbon monoxide alarm, Hot water, Luggage dropoff allowed, Private entrance, Smoke alarm, Heating, Hair dryer, Dedicated workspace, Iron, Free street parking, Bed linens, Shampoo, Fire extinguisher, Hangers, Cable TV, Essentials, Washer, Long term stays allowed, TV, Air conditioning]
verifications_array	[email, phone, reviews, offline_government_id, selfie, government_id, identity_manual]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,17],[1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,3,4],[1.0,1.0,1.0,1.0,1.0])
since_year	2011
log_price	4.605170185988092
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	2
bedrooms_imp	1
beds_imp	2
minimum_nights_imp	30
maximum_nights_imp	365
minimum_minimum_nights_imp	30
maximum_minimum_nights_imp	30
minimum_nights_avg_ntm_imp	30.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1

calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	6.0
property_indexed_imp	4.0
room_indexed_imp	0.0
has_tv	true
-RECORD 14-----	
-----	
-----	
id	200643
host_since	2011/08/16
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Strathcona
host_listings_count	4
host_total_listings_count	4
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown Eastside
neighbourhood_group_cleansed	null
latitude	49.27384
longitude	-123.08289
property_type	Private room in house
room_type	Private room
accommodates	4
bathrooms	null
bathrooms_text	2 shared baths
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wi fi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Garden or backyard', 'Dishwasher', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Room-darkening shades', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib']
price	87
minimum_nights	1
maximum_nights	1125
minimum_minimum_nights	1
maximum_minimum_nights	1

minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	1.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	t
calculated_host_listings_count	4
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	4
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown Eastside
property_reduced	Private room in house
room_reduced	Private room
neighbourhood_indexed	6.0
property_indexed	3.0
room_indexed	1.0
amenities_array	[Kitchen, Oven, Indoor fireplace, Microwave, Wifi, Dryer, Carbon monoxide alarm, Stove, Hot water, Garden or backyard, Dishwasher, Extra pillows and blankets, Luggage dropoff allowed, Cooking basics, Room-darkening shades, Smoke alarm, Heating, Hair dryer, Dedicated work space, First aid kit, Iron, Free street parking, Coffee maker, Bed linens, Shampoo, Fire extinguisher, Dishes and silverware, Hangers, Refrigerator, Essentials, Washer, Long term stays allowed, Pack \u2019n Play/travel crib]
verifications_array	[email, phone, reviews, jumio, government_id]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,11,12,13,14,15,16,17,18,19],[1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,4],[1.0,1.0,1.0,1.0])
since_year	2011
log_price	4.465908118654584
host_listings_count_imp	4
host_total_listings_count_imp	4
accommodates_imp	4
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	1
maximum_nights_imp	1125
minimum_minimum_nights_imp	1
maximum_minimum_nights_imp	1
minimum_nights_avg_ntm_imp	1.0
calculated_host_listings_count_imp	4
calculated_host_listings_count_entire_homes_imp	0
calculated_host_listings_count_private_rooms_imp	4
neighbourhood_indexed_imp	6.0
property_indexed_imp	3.0
room_indexed_imp	1.0
has_tv	false

-RECORD 15-----

id	248014
host_since	2011/10/16
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.5
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Grandview-Woodland
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.29103
longitude	-123.05782
property_type	Entire house
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	0
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wi fi', 'Host greets you', 'Dryer', 'Stove', 'Carbon monoxide alarm', 'Hot water', 'Garden or backyard', 'Dishwasher', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Free street parking', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Cable TV', 'Refrigerator', 'Hangers', 'Essentials', 'Washer', 'Long term stays allowed', 'BBQ grill', 'TV', 'Cleaning before checkout']
price	100
minimum_nights	31
maximum_nights	180
minimum_minimum_nights	31
maximum_minimum_nights	31
minimum_maximum_nights	180
maximum_maximum_nights	180
minimum_nights_avg_ntm	31.0
maximum_nights_avg_ntm	180.0
has_availability	t

availability_30	4
availability_60	4
availability_90	4
availability_365	113
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Grandview-Woodland
property_reduced	Entire house
room_reduced	Entire home/apt
neighbourhood_indexed	8.0
property_indexed	2.0
room_indexed	0.0
amenities_array	[Kitchen, Oven, Indoor fireplace, Microwave, Wifi, Host greets you, Dryer, Stove, Carbon monoxide alarm, Hot water, Garden or backyard, Dishwasher, Cooking basics, Smoke alarm, Heating, Hair dryer, Dedicated workspace, First aid kit, Iron, Free street parking, Dishes and silverware, Fire extinguisher, Patio or balcony, Cable TV, Refrigerator, Hangers, Essentials, Washer, Long term stays allowed, BBQ grill, TV, Cleaning before checkout]
verifications_array	[email, phone, reviews, jumio, government_id]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,10,11,12,14,15,16,17,18,19],[1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0)	(5,[0,1,2,4],[1.0,1.0,1.0,1.0])
verifications_vector	2011
since_year	4.605170185988092
log_price	1
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	3
bedrooms_imp	2
beds_imp	0
minimum_nights_imp	31
maximum_nights_imp	180
minimum_minimum_nights_imp	31
maximum_minimum_nights_imp	31
minimum_nights_avg_ntm_imp	31.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	8.0
property_indexed_imp	2.0
room_indexed_imp	0.0
has_tv	true

-RECORD 16-

---



---



---



---



---

id	258636
host_since	2011/08/09
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27796
longitude	-123.12671
property_type	Entire apartment
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Iron', 'Elevator', 'Gym', 'Hangers', 'Smoke alarm', 'Wifi', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Free parking on premises', 'Long term stays allowed', 'Hair dryer', 'Shampoo', 'Dedicated workspace']
price	99
minimum_nights	120
maximum_nights	365
minimum_minimum_nights	120
maximum_minimum_nights	120
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	120.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	11
availability_90	41
availability_365	316
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0

neighbourhood_reduced	Downtown
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	0.0
room_indexed	0.0
amenities_array	[Kitchen, Iron, Elevator, Gym, Hangers, Smoke alarm, WiFi, Essentials, Heating, Washer, Dryer, Free parking on premises, Long term stays allowed, Hair dryer, Shampoo, Dedicated workspace]
verifications_array	[email, phone, reviews, jumio, government_id]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,11,13,14],[1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,4],[1.0,1.0,1.0,1.0])
since_year	2011
log_price	4.59511985013459
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	4
bedrooms_imp	1
beds_imp	2
minimum_nights_imp	120
maximum_nights_imp	365
minimum_minimum_nights_imp	120
maximum_minimum_nights_imp	120
minimum_nights_avg_ntm_imp	120.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	0.0
property_indexed_imp	0.0
room_indexed_imp	0.0
has_tv	false

id	283841
host_since	2009/08/10
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.93
host_acceptance_rate	0.88
host_is_superhost	f
host_neighbourhood	Coal Harbour
host_listings_count	49

host_total_listings_count	49
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.2872
longitude	-123.12352
property_type	Entire apartment
room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	3 baths
bedrooms	3
beds	3
amenities	['Kitchen', 'Hot tub', 'Oven', 'Pool', 'Gym', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free parking on premises', 'Coffee maker', 'Dishes and silverware', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning']
price	197
minimum_nights	90
maximum_nights	1125
minimum_minimum_nights	90
maximum_minimum_nights	90
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	41
calculated_host_listings_count_entire_homes	41
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	0.0
room_indexed	0.0
amenities_array	[Kitchen, Hot tub, Oven, Pool, Gym, Indoor fireplace, Microwave, Wifi, Dryer, Carbon monoxide alarm, Stove, Hot water, Dishwasher, Smoke alarm, Heating, Hair dryer, Dedicated workspace, Iron, Free parking on premises, Coffee maker, Dishes and silverware, Hangers, Cable TV, Mi
crowave	
Wifi	
Dryer	
Carbon monoxide alarm	
Stove	
Hot water	
Dishwasher	
Smoke alarm	
Heating	
Hair dryer	
Dedicated workspace	
Iron	
Free parking on premises	
Coffee maker	
Dishes and silverware	
Hangers	
Cable TV	

Refrigerator, Essentials, Washer, Long term stays allowed, TV, Air conditioning]	
verifications_array	[email, phone, reviews, jumio, government_id]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,10,11,12,14,15,16,18],[1.0,1.0,
1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])	1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,4],[1.0,1.0,1.0,1.0])
since_year	2009
log_price	5.2832037287379885
host_listings_count_imp	49
host_total_listings_count_imp	49
accommodates_imp	6
bedrooms_imp	3
beds_imp	3
minimum_nights_imp	90
maximum_nights_imp	1125
minimum_minimum_nights_imp	90
maximum_minimum_nights_imp	90
minimum_nights_avg_ntm_imp	90.0
calculated_host_listings_count_imp	41
calculated_host_listings_count_entire_homes_imp	41
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	0.0
property_indexed_imp	0.0
room_indexed_imp	0.0
has_tv	true

id	323090
host_since	2012/01/01
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0.85
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.28206

longitude	-123.12461
property_type	Entire apartment
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Cooking basics', 'Iron', 'Elevator', 'Gym', 'Hangers', 'Cable TV', 'Smoke alarm', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Carbon monoxide alarm', 'Wifi', 'TV', 'Long term stays allowed', 'Hair dryer', 'Shampoo', 'Dishes and silverware', 'Dedicated workspace']
pace']	
price	168
minimum_nights	180
maximum_nights	180
minimum_minimum_nights	180
maximum_minimum_nights	180
minimum_maximum_nights	180
maximum_maximum_nights	180
minimum_nights_avg_ntm	180.0
maximum_nights_avg_ntm	180.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	141
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	0.0
room_indexed	0.0
amenities_array	[Kitchen, Cooking basics, Iron, Elevator, Gym, Hangers, Cable TV, Smoke alarm, Essentials, Heating, Washer, Dryer, Carbon monoxide alarm, Wifi, TV, Long term stays allowed, Hair dryer, Shampoo, Dishes and silverware, Dedicated workspace]
verifications_array	[email, phone, reviews, jumio, government_id]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,10,11,13,14,15,16,19],[1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,4],[1.0,1.0,1.0,1.0])
since_year	2012
log_price	5.123963979403259
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	2

bedrooms_imp	1
beds_imp	1
minimum_nights_imp	180
maximum_nights_imp	180
minimum_minimum_nights_imp	180
maximum_minimum_nights_imp	180
minimum_nights_avg_ntm_imp	180.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	0.0
property_indexed_imp	0.0
room_indexed_imp	0.0
has_tv	true
-RECORD 19-	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
id	359942
host_since	2011/09/23
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Yaletown
host_listings_count	8
host_total_listings_count	8
host_verifications	['email', 'phone', 'facebook', 'reviews']
host_has_profile_pic	t
host_identity_verified	f
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27825
longitude	-123.11865
property_type	Private room in apartment
room_type	Private room
accommodates	2
bathrooms	null
bathrooms_text	1 shared bath
bedrooms	2
beds	1
amenities	['Kitchen', 'Lake access', 'Oven', 'Paid parking on premises', 'Paid parking off premises', 'Gym', 'Microwave', 'Wifi', 'Dryer', 'Stove', 'Hot water', 'Dishwasher',

```

'Extra pillows and blankets', 'Cooking basics', 'Heating', 'Lock on bedroom door', 'Hair dryer', 'Iron', 'Coffee maker', 'Bed linens', 'Pocket wifi', 'Shampoo', 'Dishes and silverware', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Elevator']
    price                                | 240
    minimum_nights                         | 30
    maximum_nights                          | 1125
    minimum_minimum_nights                 | 30
    maximum_minimum_nights                 | 30
    minimum_maximum_nights                 | 1125
    maximum_maximum_nights                 | 1125
    minimum_nights_avg_ntm                | 30.0
    maximum_nights_avg_ntm                | 1125.0
    has_availability                       | t
    availability_30                        | 29
    availability_60                        | 59
    availability_90                        | 89
    availability_365                       | 364
    instant_bookable                       | f
    calculated_host_listings_count         | 7
    calculated_host_listings_count_entire_homes | 3
    calculated_host_listings_count_private_rooms | 4
    calculated_host_listings_count_shared_rooms | 0
    neighbourhood_reduced                  | Downtown
    property_reduced                      | Private room in apartment
    room_reduced                           | Private room
    neighbourhood_indexed                  | 0.0
    property_indexed                      | 6.0
    room_indexed                           | 1.0
    amenities_array                        | [Kitchen, Lake access, Oven, Paid parking on premises, Paid parking off premises, Gym, Microwave, Wifi, Dryer, Stove, Hot water, Dishwasher, Extra pillows and blankets, Cooking basics, Heating, Lock on bedroom door, Hair dryer, Iron, Coffee maker, Bed linens, Pocket wifi, Shampoo, Dishes and silverware, Hangers, Refrigerator, Essentials, Washer, Long term stays allowed, Elevator]
    verifications_array                   | [email, phone, facebook, reviews]
    amenities_vector                      | (20,[0,1,3,4,5,6,7,8,9,12,13,14,16,18,19],[1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
    verifications_vector                 | (5,[0,1,4],[1.0,1.0,1.0])
    since_year                            | 2011
    log_price                             | 5.480638923341991
    host_listings_count_imp               | 8
    host_total_listings_count_imp         | 8
    accommodates_imp                     | 2
    bedrooms_imp                          | 2
    beds_imp                             | 1
    minimum_nights_imp                   | 30
    maximum_nights_imp                  | 1125
    minimum_minimum_nights_imp           | 30
    maximum_minimum_nights_imp           | 30
    minimum_nights_avg_ntm_imp           | 30.0

```

```

calculated_host_listings_count_imp | 7
calculated_host_listings_count_entire_homes_imp | 3
calculated_host_listings_count_private_rooms_imp | 4
neighbourhood_indexed_imp | 0.0
property_indexed_imp | 6.0
room_indexed_imp | 1.0
has_tv | false
only showing top 20 rows

```

In [61]:

```

assembler = VectorAssembler(
    inputCols=imp_columns + ["has_tv", "has_washer"],
    outputCol="features", handleInvalid="error")

pipeline = Pipeline(stages=new_stages + [assembler]).fit(dataset)
df = pipeline.transform(dataset)

rf = RandomForestRegressor(featuresCol="features", labelCol='log_price', seed=42)
model = rf.fit(df)

df_devset = pipeline.transform(devset)
predictions = model.transform(df_devset)

predictions.select("features", "log_price", "prediction").show(5)

metrics = RegressionMetrics(predictions.select("prediction", "log_price").rdd\
                           .map(lambda r: (math.exp(r['prediction']), math.exp(r['log_price']))))

print("base:", baseError)
selectedError = metrics.meanAbsoluteError
selectedError

```

features	log_price	prediction
[49.0,49.0,5.0,2,...]	5.0106352940962555	4.999061209987358
[1.0,1.0,4.0,1.0,...]	5.293304824724492	4.890483105740676
[5.0,5.0,6.0,3.0,...]	5.501258210544727	5.315811550161152
[1.0,1.0,2.0,1.0,...]	5.225746673713202	4.716056420033971
[1.0,1.0,2.0,1.0,...]	4.852030263919617	4.619710977957064

only showing top 5 rows

base: 56.83296858469796

Out[61]: 56.64012451569069

That didn't work that well. Random forests are very robust, so there is no boost in the signal by dropping the amenities.

Let us take a look at the feature importance again.

In [62]:

```
labels = columns + ["has_tv", "has_washer"]

importances = [ (model.featureImportances[idx], lbl) for idx, lbl in enumerate(labels) ]
table = '<table><tr><th>Rank</th><th>Feature</th><th>Importance</th></tr>'
for idx, pair in enumerate(sorted(importances, reverse=True)):
    score, lbl = pair
    table = '{}<tr><td>{}</td><td>{}</td><td style="text-align: left">{}</td></tr>'.format(table, idx+1, lbl
table += '</table>'
display(HTML(table))
```

Rank	Feature	Importance
1	bedrooms	0.22562033455396632
2	room_indexed	0.193476796978457
3	accommodates	0.18120404195660636
4	beds	0.13288450729608386
5	calculated_host_listings_count_private_rooms	0.055628222914621155
6	calculated_host_listings_count_entire_homes	0.04272812480337147
7	property_indexed	0.03284629505114232
8	neighbourhood_indexed	0.027921872333126513
9	minimum_nights	0.02033478636540185
10	minimum_nights_avg_ntm	0.017432371375466795
11	maximum_minimum_nights	0.015392475109351591
12	has_tv	0.010400419989559168
13	calculated_host_listings_count	0.010050188789236749
14	minimum_minimum_nights	0.00961125717695391
15	host_listings_count	0.008305633517450998
16	host_total_listings_count	0.006618713318359797
17	has_washer	0.0059228959156915565
18	maximum_nights	0.0036210625551524483

The neighbourhood doesn't seem as important as it should but we know most of our training properties are downtown. It is possible the neighbourhood is not being as useful as we would like because the value of a location is regarding its distance, for example to SkyTrain stations (Vancouver's elevated subway alternative).

## Expanding using external data: SkyTrain stations

For that, we will have to go back to the latitude and longitude columns in the raw data and compute a rough approximation of the distance to the closest SkyTrain station for them, using [OpenStreet map data](#) available under the [Open Database License](#).

In [63]:

```
stops = list()
with open("stops.tsv") as s:
    for row in s:
        stops.append(tuple(map(float, row.split("\t"))))
stops
```

Out[63]:

```
[(49.2591619, -122.9639466),
 (49.2533813, -122.9181633),
 (49.2484049, -122.8968898),
 (49.1895232, -122.847929),
 (49.1827396, -122.84468),
 (49.2297489, -123.0127361),
 (49.2483091, -123.0559279),
 (49.2441271, -123.045876),
 (49.2257767, -123.0038962),
 (49.2200544, -122.9885247),
 (49.2121895, -122.9593092),
 (49.2000809, -122.9488866),
 (49.2013864, -122.9126807),
 (49.2047284, -122.9062802),
 (49.2534613, -122.918123),
 (49.2793597, -123.1093495),
 (49.2861459, -123.1120211),
 (49.2484747, -122.8968053),
 (49.2618723, -123.069195),
 (49.2629063, -123.0685311),
 (49.2649587, -123.013462),
 (49.1956136, -123.1260625),
 (49.1967024, -123.1464206),
 (49.1839068, -123.136362),
 (49.1747215, -123.1365025),
 (49.2611963, -122.8901154),
 (49.1930946, -123.1579202),
```

```
(49.2043891, -122.8741208),  
(49.224476, -122.8895687),  
(49.2384152, -123.0319039),  
(49.2657805, -123.078985),  
(49.2730906, -123.1003413),  
(49.2333355, -122.8827927),  
(49.2545929, -122.9390127),  
(49.2647152, -122.98211),  
(49.2663735, -123.001671),  
(49.2607565, -123.0328558),  
(49.258881, -123.045543),  
(49.2747473, -122.8004037),  
(49.1681288, -123.136343),  
(49.2778955, -122.8449182),  
(49.2771345, -122.8277649),  
(49.2803533, -122.7940182),  
(49.2853142, -122.7917096),  
(49.2096206, -123.117002),  
(49.2264759, -123.1165034),  
(49.2330037, -123.1162801),  
(49.2489773, -123.1154122),  
(49.2629029, -123.1148243),  
(49.2666036, -123.1154558),  
(49.2742425, -123.1217911),  
(49.2820749, -123.1190169),  
(49.2856579, -123.1134773),  
(49.2829007, -123.1151647),  
(49.2852909, -123.1189344),  
(49.1942258, -123.1784147),  
(49.1989111, -122.8506765)]
```

In [64]:

```
gps_point = VectorAssembler(inputCols=["latitude", "longitude"], outputCol="gps")  
stages.append(gps_point)
```

In [65]:

```
gps_point.transform(df).show(truncate=False, vertical=True)
```

-RECORD 0-----

---

id	host_since	gps
		13358   2009/11/07

host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.71
host_acceptance_rate	0.71
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'offl
ine_government_id', 'selfie', 'government_id']	
host_has_profile_pic	f
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	West End
neighbourhood_group_cleansed	null
latitude	49.28209
longitude	-123.12515
property_type	Entire condominium
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Gym', 'Paid parking off premises', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Extra pillows and blankets', 'Dishwasher', 'Cooking basics', 'Hot water kettle', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning', 'Elevator']
price	90
minimum_nights	30
maximum_nights	60
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	11
availability_60	41
availability_90	70
availability_365	70
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0

neighbourhood_reduced	West End
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	3.0
property_indexed	1.0
room_indexed	0.0
log_price	4.499809670330265
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	2
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	30
maximum_nights_imp	60
minimum_minimum_nights_imp	30
maximum_minimum_nights_imp	30
minimum_nights_avg_ntm_imp	30.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	3.0
property_indexed_imp	1.0
room_indexed_imp	0.0
has_tv	true
has_washer	true
features	[1.0,1.0,2.0,1.0,1.0,30.0,60.0,30.0,30.0,30.0,1.0,1.0,0.
0,3.0,1.0,0.0,1.0,1.0]	
gps	[49.28209,-123.12515]
-RECORD 1-----	
-----	
-----	
-----	
-----	
-----	

id	16254
host_since	2009/12/15
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Hastings-Sunrise
host_listings_count	1
host_total_listings_count	1
host_verifications	['phone', 'facebook', 'offline_government_id', 'selfie',
'government_id', 'identity_manual']	
host_has_profile_pic	t

host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Hastings-Sunrise
neighbourhood_group_cleansed	null
latitude	49.27734
longitude	-123.04152
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Hair dryer', 'Lockbox', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Children\u2019s books and toys', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib']
price	195
minimum_nights	3
maximum_nights	31
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	228
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Hastings-Sunrise
property_reduced	Entire guest suite
room_reduced	Entire home/apt
neighbourhood_indexed	9.0
property_indexed	4.0
room_indexed	0.0
log_price	5.272999558563747
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	4
bedrooms_imp	2

beds_imp	3
minimum_nights_imp	3
maximum_nights_imp	31
minimum_minimum_nights_imp	3
maximum_minimum_nights_imp	3
minimum_nights_avg_ntm_imp	3.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	9.0
property_indexed_imp	4.0
room_indexed_imp	0.0
has_tv	false
has_washer	true
features	[1.0,1.0,4.0,2.0,3.0,3.0,31.0,3.0,3.0,3.0,1.0,1.0,0.0,9.0,4.0,0.0,0.0,1.0]
gps	[49.27734, -123.04152]

-RECORD 2-----

-----

-----

-----

-----

id	17765
host_since	2010/01/07
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Mount Pleasant
host_listings_count	1
host_total_listings_count	1
host_verifications	['phone', 'facebook', 'reviews', 'jumio', 'offline_government_id', 'selfie', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Mount Pleasant
neighbourhood_group_cleansed	null
latitude	49.26181
longitude	-123.10905
property_type	Entire apartment
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath

bedrooms	1
beds	1
amenities	['Kitchen', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Essentials', 'Washer', 'Long term stays allowed', 'Elevator']
price	94
minimum_nights	3
maximum_nights	60
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Mount Pleasant
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	5.0
property_indexed	0.0
room_indexed	0.0
log_price	4.543294782270004
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	2
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	3
maximum_nights_imp	60
minimum_minimum_nights_imp	3
maximum_minimum_nights_imp	3
minimum_nights_avg_ntm_imp	3.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	5.0
property_indexed_imp	0.0
room_indexed_imp	0.0

has_tv	false
has_washer	true
features	[1.0,1.0,2.0,1.0,1.0,3.0,60.0,3.0,3.0,3.0,1.0,1.0,0.0,5.0,0.0,0.0,0.0,1.0]
gps	[49.26181,-123.10905]
-RECORD 3-----	
-----	
-----	
-----	
-----	
-----	
id	18795
host_since	2010/01/13
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.7
host_acceptance_rate	0.4
host_is_superhost	f
host_neighbourhood	West End
host_listings_count	3
host_total_listings_count	3
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	West End
neighbourhood_group_cleansed	null
latitude	49.28251
longitude	-123.12827
property_type	Private room in house
room_type	Private room
accommodates	2
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Cable TV', 'Wifi', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Long term stays allowed']
price	50
minimum_nights	30
maximum_nights	360
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	360
maximum_maximum_nights	360
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	360.0

has_availability	t
availability_30	9
availability_60	20
availability_90	50
availability_365	325
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	3
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	West End
property_reduced	Private room in house
room_reduced	Private room
neighbourhood_indexed	3.0
property_indexed	3.0
room_indexed	1.0
log_price	3.912023005428146
host_listings_count_imp	3
host_total_listings_count_imp	3
accommodates_imp	2
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	30
maximum_nights_imp	360
minimum_minimum_nights_imp	30
maximum_minimum_nights_imp	30
minimum_nights_avg_ntm_imp	30.0
calculated_host_listings_count_imp	3
calculated_host_listings_count_entire_homes_imp	0
calculated_host_listings_count_private_rooms_imp	3
neighbourhood_indexed_imp	3.0
property_indexed_imp	3.0
room_indexed_imp	1.0
has_tv	true
has_washer	true
features	[3.0,3.0,2.0,1.0,1.0,30.0,360.0,30.0,30.0,30.0,3.0,0.0,3.0,3.0,3.0,1.0,1.0,1.0]
gps	[49.28251,-123.12827]

-RECORD 4-----

---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---

id	21913
host_since	2010/02/22
host_location	Vancouver, British Columbia, Canada

host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	t
host_neighbourhood	Renfrew-Collingwood
host_listings_count	3
host_total_listings_count	3
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'selfie', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Renfrew-Collingwood
neighbourhood_group_cleansed	null
latitude	49.23427
longitude	-123.05309
property_type	Entire house
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Luggage dropoff allowed', 'Private entrance', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Bed linens', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV']
price	80
minimum_nights	28
maximum_nights	400
minimum_minimum_nights	28
maximum_minimum_nights	28
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	28.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	2
availability_60	13
availability_90	43
availability_365	318
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Renfrew-Collingwood
property_reduced	Entire house

room_reduced	Entire home/apt
neighbourhood_indexed	11.0
property_indexed	2.0
room_indexed	0.0
log_price	4.382026634673881
host_listings_count_imp	3
host_total_listings_count_imp	3
accommodates_imp	2
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	28
maximum_nights_imp	400
minimum_minimum_nights_imp	28
maximum_minimum_nights_imp	28
minimum_nights_avg_ntm_imp	28.0
calculated_host_listings_count_imp	3
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	2
neighbourhood_indexed_imp	11.0
property_indexed_imp	2.0
room_indexed_imp	0.0
has_tv	true
has_washer	true
features	[3.0, 3.0, 2.0, 1.0, 1.0, 28.0, 400.0, 28.0, 28.0, 28.0, 3.0, 1.0, 2.0, 11.0, 2.0, 0.0, 1.0, 1.0]
gps	[49.23427, -123.05309]
-RECORD 5-----	
-----	
-----	
-----	
-----	
-----	
-----	
id	24273
host_since	2011/10/09
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	0.82
host_is_superhost	f
host_neighbourhood	Kitsilano
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'jumio', 'offline_governme
nt_id', 'government_id']	
host_has_profile_pic	f
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada

neighbourhood_cleansed	Kitsilano
neighbourhood_group_cleansed	null
latitude	49.2626
longitude	-123.17308
property_type	Entire apartment
room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wi fi', 'Dryer', 'Fireplace guards', 'Carbon monoxide alarm', 'Stove', 'Crib', 'Hot water', 'Babysitter recommendations', 'Garden or backyard', 'Extra pillows and blankets', 'Dishwasher', 'Luggage dropoff allowed', 'Cooking basics', 'Room-darkening shades', 'Private entrance', 'Smoke alarm', 'Baking sheet', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bathtub', 'Coffee maker', 'Bed linens', 'Keypad', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Shower gel', 'Patio or balcony', 'Children\u2019s books and toys', 'High chair', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib', 'TV', 'Ethernet connection']
price	200
minimum_nights	30
maximum_nights	365
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	0
availability_90	10
availability_365	223
instant_bookable	f
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Kitsilano
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	2.0
property_indexed	0.0
room_indexed	0.0
log_price	5.298317366548036
host_listings_count_imp	2
host_total_listings_count_imp	2
accommodates_imp	6
bedrooms_imp	2

beds_imp	3
minimum_nights_imp	30
maximum_nights_imp	365
minimum_minimum_nights_imp	30
maximum_minimum_nights_imp	30
minimum_nights_avg_ntm_imp	30.0
calculated_host_listings_count_imp	2
calculated_host_listings_count_entire_homes_imp	2
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	2.0
property_indexed_imp	0.0
room_indexed_imp	0.0
has_tv	true
has_washer	true
features	[2.0,2.0,6.0,2.0,3.0,30.0,365.0,30.0,30.0,30.0,2.0,2.0,0.0,2.0,0.0,0.0,1.0,1.0]
gps	[49.2626, -123.17308]

-RECORD 6-----

-----

-----

-----

-----

id	42645
host_since	2010/04/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	4
host_total_listings_count	4
host_verifications	['email', 'phone', 'facebook', 'reviews']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.28001
longitude	-123.12475
property_type	Entire condominium
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	1

beds	2
amenities	['Kitchen', 'Oven', 'Paid parking on premises', 'Paid parking off premises', 'Gym', 'Microwave', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Luggage dropoff allowed', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Coffee maker', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Patio or balcony', 'Children\u2019s books and toys', 'High chair', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib', 'TV', 'Elevator']
price	159
minimum_nights	32
maximum_nights	365
minimum_minimum_nights	32
maximum_minimum_nights	32
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	32.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	29
availability_90	59
availability_365	333
instant_bookable	t
calculated_host_listings_count	4
calculated_host_listings_count_entire_homes	4
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	1.0
room_indexed	0.0
log_price	5.0689042022202315
host_listings_count_imp	4
host_total_listings_count_imp	4
accommodates_imp	3
bedrooms_imp	1
beds_imp	2
minimum_nights_imp	32
maximum_nights_imp	365
minimum_minimum_nights_imp	32
maximum_minimum_nights_imp	32
minimum_nights_avg_ntm_imp	32.0
calculated_host_listings_count_imp	4
calculated_host_listings_count_entire_homes_imp	4
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	0.0
property_indexed_imp	1.0

room_indexed_imp	0.0
has_tv	true
has_washer	true
features	[4.0,4.0,3.0,1.0,2.0,32.0,365.0,32.0,32.0,32.0,4.0,4.0,0.0,0.0,1.0,0.0,1.0,1.0]
gps	[49.28001,-123.12475]
-RECORD 7-----	
-----	
-----	
-----	
-----	
id	54261
host_since	2010/10/05
host_location	Vancouver, British Columbia, Canada
host_response_time	a few days or more
host_response_rate	0
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Downtown Vancouver
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'selfie', 'government_id', 'identity_manual']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27655
longitude	-123.12485
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot tub', 'Gym', 'Indoor fireplace', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free parking on premises', 'Shampoo', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning', 'Elevator']
price	126
minimum_nights	90
maximum_nights	365
minimum_minimum_nights	90

maximum_minimum_nights	90
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	f
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	1.0
room_indexed	0.0
log_price	4.836281906951478
host_listings_count_imp	2
host_total_listings_count_imp	2
accommodates_imp	4
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	90
maximum_nights_imp	365
minimum_minimum_nights_imp	90
maximum_minimum_nights_imp	90
minimum_nights_avg_ntm_imp	90.0
calculated_host_listings_count_imp	2
calculated_host_listings_count_entire_homes_imp	2
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	0.0
property_indexed_imp	1.0
room_indexed_imp	0.0
has_tv	true
has_washer	true
features	[2.0,2.0,4.0,1.0,1.0,90.0,365.0,90.0,90.0,90.0,2.0,2.0,
0.0,0.0,1.0,0.0,1.0,1.0]	
gps	[49.27655,-123.12485]
-RECORD 8-	

id	72659
host_since	2011/02/03
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Commercial Drive
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.27357
longitude	-123.07024
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	['Kitchen', 'Lake access', 'Oven', 'Paid parking off premises', 'Gym', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'BBQ grill', 'TV', 'Elevator']
price	210
minimum_nights	7
maximum_nights	21
minimum_minimum_nights	7
maximum_minimum_nights	7
minimum_maximum_nights	21
maximum_maximum_nights	21
minimum_nights_avg_ntm	7.0
maximum_nights_avg_ntm	21.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	40
instant_bookable	f
calculated_host_listings_count	1

calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Grandview-Woodland
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	8.0
property_indexed	1.0
room_indexed	0.0
log_price	5.3471075307174685
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	4
bedrooms_imp	2
beds_imp	2
minimum_nights_imp	7
maximum_nights_imp	21
minimum_minimum_nights_imp	7
maximum_minimum_nights_imp	7
minimum_nights_avg_ntm_imp	7.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	8.0
property_indexed_imp	1.0
room_indexed_imp	0.0
has_tv	true
has_washer	true
features	[1.0,1.0,4.0,2.0,2.0,7.0,21.0,7.0,7.0,7.0,1.0,1.0,0.0,8.
0,1.0,0.0,1.0,1.0]	
gps	[49.27357,-123.07024]
-RECORD 9-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
id	77157
host_since	2011/02/27
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Arbutus Ridge
host_listings_count	2
host_total_listings_count	2

host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'offl
ine_government_id', 'government_id']	t
host_has_profile_pic	t
host_identity_verified	Vancouver, British Columbia, Canada
neighbourhood	Arbutus Ridge
neighbourhood_cleansed	null
neighbourhood_group_cleansed	49.24675
latitude	-123.16711
longitude	Private room in guest suite
property_type	Private room
room_type	3
accommodates	null
bathrooms	1 private bath
bathrooms_text	1
bedrooms	2
beds	['Kitchen', 'Microwave', 'Wifi', 'Laundromat nearby', 'Dryer', 'Hot water', 'Garden or backyard', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Heating', 'Mini fridge', 'Single level home', 'Hair dryer', 'Lockbox', 'Dedicated workspace', 'First aid kit', 'Iron', 'Body soap', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Barbecue utensils', 'Shower gel', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Conditioner', 'BBQ grill', 'Beach essentials', 'TV', 'Long term stays allowed']
amenities	75
price	3
minimum_nights	60
maximum_nights	3
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	3
availability_60	3
availability_90	3
availability_365	267
instant_bookable	t
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	OTHER
property_reduced	OTHER
room_reduced	Private room
neighbourhood_indexed	1.0
property_indexed	5.0
room_indexed	1.0
log_price	4.31748811353631

host_listings_count_imp	2
host_total_listings_count_imp	2
accommodates_imp	3
bedrooms_imp	1
beds_imp	2
minimum_nights_imp	3
maximum_nights_imp	60
minimum_minimum_nights_imp	3
maximum_minimum_nights_imp	3
minimum_nights_avg_ntm_imp	3.0
calculated_host_listings_count_imp	2
calculated_host_listings_count_entire_homes_imp	0
calculated_host_listings_count_private_rooms_imp	2
neighbourhood_indexed_imp	1.0
property_indexed_imp	5.0
room_indexed_imp	1.0
has_tv	true
has_washer	true
features	[2.0,2.0,3.0,1.0,2.0,3.0,60.0,3.0,3.0,3.0,2.0,0.0,2.0,1.0,5.0,1.0,1.0,1.0]
gps	[49.24675, -123.16711]

-RECORD 10-----

-----

-----

-----

id	111077
host_since	2011/05/09
host_location	North Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0.33
host_is_superhost	f
host_neighbourhood	Grandview-Woodland
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'governrnment_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.26726
longitude	-123.05969
property_type	Entire guest suite

room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	['Kitchen', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Stove', 'Hot water', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Heating', 'Hair dryer', 'Iron', 'Free street parking', 'Coffee maker', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed']
price	125
minimum_nights	3
maximum_nights	365
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	4
availability_60	34
availability_90	64
availability_365	339
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Grandview-Woodland
property_reduced	Entire guest suite
room_reduced	Entire home/apt
neighbourhood_indexed	8.0
property_indexed	4.0
room_indexed	0.0
log_price	4.8283137373023015
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	3
bedrooms_imp	2
beds_imp	2
minimum_nights_imp	3
maximum_nights_imp	365
minimum_minimum_nights_imp	3
maximum_minimum_nights_imp	3
minimum_nights_avg_ntm_imp	3.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0

neighbourhood_indexed_imp	8.0
property_indexed_imp	4.0
room_indexed_imp	0.0
has_tv	false
has_washer	true
features	[1.0,1.0,3.0,2.0,2.0,3.0,365.0,3.0,3.0,3.0,1.0,1.0,0.0,
8.0,4.0,0.0,0.0,1.0]	
gps	[49.26726,-123.05969]
-RECORD 11-----	
-----	
-----	
-----	
id	125176
host_since	2011/05/24
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Riley Park
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'offline_gover
nment_id', 'government_id', 'work_email']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Riley Park
neighbourhood_group_cleansed	null
latitude	49.24648
longitude	-123.09241
property_type	Private room in house
room_type	Private room
accommodates	3
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	0
amenities	['Kitchen', 'Hot tub', 'Oven', 'Wifi', 'Carbon monoxide
alarm', 'Stove', 'Hot water', 'Garden or backyard', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair drye	
r', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bathtub', 'Free parking on premises', 'Keypad',	
'Shampoo', 'Dishes and silverware', 'Patio or balcony', 'Hangers', 'Cable TV', 'Refrigerator', 'Essential	
s', 'Long term stays allowed', 'TV']	
price	75
minimum_nights	2

maximum_nights	60
minimum_minimum_nights	2
maximum_minimum_nights	2
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	2.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	2
availability_365	268
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	1
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Riley Park
property_reduced	Private room in house
room_reduced	Private room
neighbourhood_indexed	7.0
property_indexed	3.0
room_indexed	1.0
log_price	4.31748811353631
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	3
bedrooms_imp	1
beds_imp	0
minimum_nights_imp	2
maximum_nights_imp	60
minimum_minimum_nights_imp	2
maximum_minimum_nights_imp	2
minimum_nights_avg_ntm_imp	2.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	0
calculated_host_listings_count_private_rooms_imp	1
neighbourhood_indexed_imp	7.0
property_indexed_imp	3.0
room_indexed_imp	1.0
has_tv	true
has_washer	false
features	[1.0,1.0,3.0,1.0,0.0,2.0,60.0,2.0,2.0,2.0,1.0,0.0,1.0,7.
0,3.0,1.0,1.0,0.0]	[49.24648,-123.09241]
gps	
-RECORD 12-	

id	129163
host_since	2011/05/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Renfrew-Collingwood
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'jumio', 'offline_governme
nt_id', 'government_id']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Renfrew-Collingwood
neighbourhood_group_cleansed	null
latitude	49.24507
longitude	-123.04941
property_type	Private room in house
room_type	Private room
accommodates	1
bathrooms	null
bathrooms_text	1 shared bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot water', 'Paid parking on premises', 'Lock on bedroom door', 'Free street parking', 'Cable TV', 'Smoke alarm', 'Wifi', 'Essentials', 'Heating', 'Was her', 'Dryer', 'Carbon monoxide alarm', 'Dishes and silverware', 'TV', 'Long term stays allowed', 'Host greets you', 'Hair dryer', 'Shampoo', 'Fire extinguisher']
price	45
minimum_nights	30
maximum_nights	280
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	280
maximum_maximum_nights	280
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	280.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	t

calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	1
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Renfrew-Collingwood
property_reduced	Private room in house
room_reduced	Private room
neighbourhood_indexed	11.0
property_indexed	3.0
room_indexed	1.0
log_price	3.8066624897703196
host_listings_count_imp	2
host_total_listings_count_imp	2
accommodates_imp	1
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	30
maximum_nights_imp	280
minimum_minimum_nights_imp	30
maximum_minimum_nights_imp	30
minimum_nights_avg_ntm_imp	30.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	0
calculated_host_listings_count_private_rooms_imp	1
neighbourhood_indexed_imp	11.0
property_indexed_imp	3.0
room_indexed_imp	1.0
has_tv	true
has_washer	true
features	[2.0,2.0,1.0,1.0,1.0,30.0,280.0,30.0,30.0,30.0,1.0,0.0,
1.0,11.0,3.0,1.0,1.0,1.0]	
gps	[49.24507, -123.04941]

-RECORD 13-----

-----

-----

-----

-----

-----

id	174135
host_since	2011/07/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Downtown Eastside
host_listings_count	1

host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'offline_government_id',
'selfie', 'government_id', 'identity_manual']	t
host_has_profile_pic	t
host_identity_verified	Vancouver, British Columbia, Canada
neighbourhood	Downtown Eastside
neighbourhood_cleansed	null
neighbourhood_group_cleansed	49.27782
latitude	-123.08985
longitude	Entire guest suite
property_type	Entire home/apt
room_type	2
accommodates	null
bathrooms	1 bath
bathrooms_text	1
bedrooms	2
beds	
amenities	['Kitchen', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Private entrance', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning']
price	100
minimum_nights	30
maximum_nights	365
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	224
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown Eastside
property_reduced	Entire guest suite
room_reduced	Entire home/apt
neighbourhood_indexed	6.0
property_indexed	4.0
room_indexed	0.0
log_price	4.605170185988092
host_listings_count_imp	1
host_total_listings_count_imp	1

accommodates_imp	2
bedrooms_imp	1
beds_imp	2
minimum_nights_imp	30
maximum_nights_imp	365
minimum_minimum_nights_imp	30
maximum_minimum_nights_imp	30
minimum_nights_avg_ntm_imp	30.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	6.0
property_indexed_imp	4.0
room_indexed_imp	0.0
has_tv	true
has_washer	true
features	[1.0,1.0,2.0,1.0,2.0,30.0,365.0,30.0,30.0,30.0,1.0,1.0,0.0,6.0,4.0,0.0,1.0,1.0]
gps	[49.27782,-123.08985]
-RECORD 14-----	

id	200643
host_since	2011/08/16
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Strathcona
host_listings_count	4
host_total_listings_count	4
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown Eastside
neighbourhood_group_cleansed	null
latitude	49.27384
longitude	-123.08289
property_type	Private room in house
room_type	Private room
accommodates	4
bathrooms	null

bathrooms_text	2 shared baths
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wi fi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Garden or backyard', 'Dishwasher', 'Extra pill ows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Room-darkening shades', 'Smoke alarm', 'Hea ting', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Hangers', 'Refrigerator', 'Essentia ls', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib']
price	87
minimum_nights	1
maximum_nights	1125
minimum_minimum_nights	1
maximum_minimum_nights	1
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	1.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	t
calculated_host_listings_count	4
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	4
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown Eastside
property_reduced	Private room in house
room_reduced	Private room
neighbourhood_indexed	6.0
property_indexed	3.0
room_indexed	1.0
log_price	4.465908118654584
host_listings_count_imp	4
host_total_listings_count_imp	4
accommodates_imp	4
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	1
maximum_nights_imp	1125
minimum_minimum_nights_imp	1
maximum_minimum_nights_imp	1
minimum_nights_avg_ntm_imp	1.0
calculated_host_listings_count_imp	4
calculated_host_listings_count_entire_homes_imp	0
calculated_host_listings_count_private_rooms_imp	4
neighbourhood_indexed_imp	6.0

property_indexed_imp	3.0
room_indexed_imp	1.0
has_tv	false
has_washer	true
features	[4.0,4.0,4.0,1.0,1.0,1.0,1125.0,1.0,1.0,1.0,4.0,0.0,4.0,
6.0,3.0,1.0,0.0,1.0]	[49.27384,-123.08289]
gps	
-RECORD 15-----	
-----	
-----	
id	248014
host_since	2011/10/16
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.5
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Grandview-Woodland
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.29103
longitude	-123.05782
property_type	Entire house
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	0
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wi fi', 'Host greets you', 'Dryer', 'Stove', 'Carbon monoxide alarm', 'Hot water', 'Garden or backyard', 'Dishw asher', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'I ron', 'Free street parking', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Cable TV', 'Refrigerator', 'Hangers', 'Essentials', 'Washer', 'Long term stays allowed', 'BBQ grill', 'TV', 'Cleaning before checkout']
price	100
minimum_nights	31
maximum_nights	180

minimum_minimum_nights	31
maximum_minimum_nights	31
minimum_maximum_nights	180
maximum_maximum_nights	180
minimum_nights_avg_ntm	31.0
maximum_nights_avg_ntm	180.0
has_availability	t
availability_30	4
availability_60	4
availability_90	4
availability_365	113
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Grandview-Woodland
property_reduced	Entire house
room_reduced	Entire home/apt
neighbourhood_indexed	8.0
property_indexed	2.0
room_indexed	0.0
log_price	4.605170185988092
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	3
bedrooms_imp	2
beds_imp	0
minimum_nights_imp	31
maximum_nights_imp	180
minimum_minimum_nights_imp	31
maximum_minimum_nights_imp	31
minimum_nights_avg_ntm_imp	31.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	8.0
property_indexed_imp	2.0
room_indexed_imp	0.0
has_tv	true
has_washer	true
features	[1.0,1.0,3.0,2.0,0.0,31.0,180.0,31.0,31.0,31.0,1.0,1.0,0.0,8.0,2.0,0.0,1.0,1.0]
gps	[49.29103,-123.05782]
-RECORD 16-	

id	258636
host_since	2011/08/09
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27796
longitude	-123.12671
property_type	Entire apartment
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Iron', 'Elevator', 'Gym', 'Hangers', 'Smoke alarm', 'Wifi', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Free parking on premises', 'Long term stays allowed', 'Hair dryer', 'Shampoo', 'Dedicated workspace']
price	99
minimum_nights	120
maximum_nights	365
minimum_minimum_nights	120
maximum_minimum_nights	120
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	120.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	11
availability_90	41
availability_365	316
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0

calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	0.0
room_indexed	0.0
log_price	4.59511985013459
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	4
bedrooms_imp	1
beds_imp	2
minimum_nights_imp	120
maximum_nights_imp	365
minimum_minimum_nights_imp	120
maximum_minimum_nights_imp	120
minimum_nights_avg_ntm_imp	120.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	0.0
property_indexed_imp	0.0
room_indexed_imp	0.0
has_tv	false
has_washer	true
features	[1.0, 1.0, 4.0, 1.0, 2.0, 120.0, 365.0, 120.0, 120.0, 120.0, 1.0, 1.0, 0.0, 0.0, 0.0, 0.0, 0.0, 1.0]
gps	[49.27796, -123.12671]
-RECORD 17-	

id	283841
host_since	2009/08/10
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.93
host_acceptance_rate	0.88
host_is_superhost	f
host_neighbourhood	Coal Harbour
host_listings_count	49
host_total_listings_count	49
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t

host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.2872
longitude	-123.12352
property_type	Entire apartment
room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	3 baths
bedrooms	3
beds	3
amenities	['Kitchen', 'Hot tub', 'Oven', 'Pool', 'Gym', 'Indoor fi replace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free parking on premises', 'Coffee maker', 'Dishes and silverware', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays all owed', 'TV', 'Air conditioning']
price	197
minimum_nights	90
maximum_nights	1125
minimum_minimum_nights	90
maximum_minimum_nights	90
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	41
calculated_host_listings_count_entire_homes	41
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	0.0
room_indexed	0.0
log_price	5.2832037287379885
host_listings_count_imp	49
host_total_listings_count_imp	49
accommodates_imp	6
bedrooms_imp	3
beds_imp	3

minimum_nights_imp	90
maximum_nights_imp	1125
minimum_minimum_nights_imp	90
maximum_minimum_nights_imp	90
minimum_nights_avg_ntm_imp	90.0
calculated_host_listings_count_imp	41
calculated_host_listings_count_entire_homes_imp	41
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	0.0
property_indexed_imp	0.0
room_indexed_imp	0.0
has_tv	true
has_washer	true
features	[49.0, 49.0, 6.0, 3.0, 3.0, 90.0, 1125.0, 90.0, 90.0, 90.0, 41.0, 41.0, 1.0, 0.0, 0.0, 0.0, 0.0, 1.0, 1.0]
gps	[49.2872, -123.12352]

-RECORD 18-----

id	323090
host_since	2012/01/01
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0.85
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.28206
longitude	-123.12461
property_type	Entire apartment
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1

amenities	['Kitchen', 'Cooking basics', 'Iron', 'Elevator', 'Gym', 'Hangers', 'Cable TV', 'Smoke alarm', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Carbon monoxide alarm', 'Wifi', 'TV', 'Long term stays allowed', 'Hair dryer', 'Shampoo', 'Dishes and silverware', 'Dedicated workspace']
price	168
minimum_nights	180
maximum_nights	180
minimum_minimum_nights	180
maximum_minimum_nights	180
minimum_maximum_nights	180
maximum_maximum_nights	180
minimum_nights_avg_ntm	180.0
maximum_nights_avg_ntm	180.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	141
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	0.0
room_indexed	0.0
log_price	5.123963979403259
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	2
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	180
maximum_nights_imp	180
minimum_minimum_nights_imp	180
maximum_minimum_nights_imp	180
minimum_nights_avg_ntm_imp	180.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	0.0
property_indexed_imp	0.0
room_indexed_imp	0.0
has_tv	true
has_washer	true
features	[1.0, 1.0, 2.0, 1.0, 1.0, 180.0, 180.0, 180.0, 180.0, 180.0, 1.0,

1.0,0.0,0.0,0.0,0.0,0.0,1.0,1.0]

gps

-RECORD 19-

| [49.28206, -123.12461]

id	359942
host_since	2011/09/23
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Yaletown
host_listings_count	8
host_total_listings_count	8
host_verifications	['email', 'phone', 'facebook', 'reviews']
host_has_profile_pic	t
host_identity_verified	f
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27825
longitude	-123.11865
property_type	Private room in apartment
room_type	Private room
accommodates	2
bathrooms	null
bathrooms_text	1 shared bath
bedrooms	2
beds	1
amenities	['Kitchen', 'Lake access', 'Oven', 'Paid parking on premises', 'Paid parking off premises', 'Gym', 'Microwave', 'Wifi', 'Dryer', 'Stove', 'Hot water', 'Dishwasher', 'Extra pillows and blankets', 'Cooking basics', 'Heating', 'Lock on bedroom door', 'Hair dryer', 'Iron', 'Coffee maker', 'Bed linens', 'Pocket wifi', 'Shampoo', 'Dishes and silverware', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Elevator']
price	240
minimum_nights	30
maximum_nights	1125
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	1125.0

```

has_availability          | t
availability_30           | 29
availability_60           | 59
availability_90           | 89
availability_365          | 364
instant_bookable          | f
calculated_host_listings_count | 7
calculated_host_listings_count_entire_homes | 3
calculated_host_listings_count_private_rooms | 4
calculated_host_listings_count_shared_rooms | 0
neighbourhood_reduced     | Downtown
property_reduced          | Private room in apartment
room_reduced               | Private room
neighbourhood_indexed      | 0.0
property_indexed           | 6.0
room_indexed                | 1.0
log_price                  | 5.480638923341991
host_listings_count_imp    | 8
host_total_listings_count_imp | 8
accommodates_imp           | 2
bedrooms_imp               | 2
beds_imp                   | 1
minimum_nights_imp         | 30
maximum_nights_imp         | 1125
minimum_minimum_nights_imp | 30
maximum_minimum_nights_imp | 30
minimum_nights_avg_ntm_imp | 30.0
calculated_host_listings_count_imp | 7
calculated_host_listings_count_entire_homes_imp | 3
calculated_host_listings_count_private_rooms_imp | 4
neighbourhood_indexed_imp  | 0.0
property_indexed_imp       | 6.0
room_indexed_imp           | 1.0
has_tv                      | false
has_washer                  | true
features                    | [8.0,8.0,2.0,2.0,1.0,30.0,1125.0,30.0,30.0,30.0,7.0,3.0,
4.0,0.0,6.0,1.0,0.0,1.0]
gps                         | [49.27825,-123.11865]
only showing top 20 rows

```

Now we can calculate the distance to the closest SkyTrain station. To get more accurate results, the curvature of the earth needs to be taken into account using a GIS library to compute distances. We will ignore this issue in this example. That means that differences in longitude will be stronger than differences in latitude, as Vancouver is rather North.

In [66]: `class SkyTrainDistance(UnaryTransformer):`

```

def __init__(self, stops):
    super(UnaryTransformer, self).__init__()
    self.stops = stops

def createTransformFunc(self):
    def closest(x):
        latx = float(x[0])
        longx = float(x[1])
        closest_dist = None
        for lat, long in self.stops:
            dist = (latx-lat)**2 + (longx-long)**2
            if closest_dist is None or dist < closest_dist:
                closest_dist = dist
        return closest_dist
    return closest

def outputDataType(self):
    return DoubleType()

def validateInputType(self, inputType):
    assert inputType == VectorUDT(), f'Expected VectorUDT() and found {inputType}'

skytrainer = SkyTrainDistance(stops).\
    setInputCol("gps"). \
    setOutputCol("sky_distance")
stages.append(skytrainer)

```

In [67]:

```

pipeline = Pipeline(stages=stages)
df = pipeline.fit(dataset).transform(dataset)

df.show(vertical=True, truncate=False)

```

-RECORD 0-----

id	13358
host_since	2009/11/07
host_location	Vancouver, British Columbia, Canada
host_response_time	within a day
host_response_rate	0.71

host_acceptance_rate	0.71
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'offl
ine_government_id', 'selfie', 'government_id']	
host_has_profile_pic	f
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	West End
neighbourhood_group_cleansed	null
latitude	49.28209
longitude	-123.12515
property_type	Entire condominium
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Gym', 'Paid parking off premises', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Extra pillows and blankets', 'Dishwasher', 'Cooking basics', 'Hot water kettle', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning', 'Elevator']
price	90
minimum_nights	30
maximum_nights	60
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	11
availability_60	41
availability_90	70
availability_365	70
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	West End
property_reduced	Entire condominium
room_reduced	Entire home/apt

neighbourhood_indexed	3.0
property_indexed	1.0
room_indexed	0.0
amenities_array	[Kitchen, Oven, Gym, Paid parking off premises, Microwave, Wifi, Dryer, Carbon monoxide alarm, Stove, Hot water, Extra pillows and blankets, Dishwasher, Cooking basics, Hot water kettle, Smoke alarm, Heating, Single level home, Hair dryer, Dedicated workspace, Iron, Coffee maker, Bed linens, Shampoo, Dishes and silverware, Hangers, Cable TV, Refrigerator, Essentials, Washer, Long term stays allowed, TV, Air conditioning, Elevator]
verifications_array	[email, phone, facebook, reviews, jumio, offline_government_id, selfie, government_id]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,18,19],[1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,3,4],[1.0,1.0,1.0,1.0,1.0])
since_year	2009
log_price	4.499809670330265
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	2
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	30
maximum_nights_imp	60
minimum_minimum_nights_imp	30
maximum_minimum_nights_imp	30
minimum_nights_avg_ntm_imp	30.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	3.0
property_indexed_imp	1.0
room_indexed_imp	0.0
gps	[49.28209, -123.12515]
sky_distance	3.761514361999455E-5

-RECORD 1-----

-----

-----

-----

-----

-----

id	16254
host_since	2009/12/15
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Hastings-Sunrise

host_listings_count	1
host_total_listings_count	1
host_verifications	['phone', 'facebook', 'offline_government_id', 'selfie', 'government_id', 'identity_manual']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Hastings-Sunrise
neighbourhood_group_cleansed	null
latitude	49.27734
longitude	-123.04152
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Hair dryer', 'Lockbox', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Children\u2019s books and toys', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib']
price	195
minimum_nights	3
maximum_nights	31
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	228
instant_bookable	t
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Hastings-Sunrise
property_reduced	Entire guest suite
room_reduced	Entire home/apt
neighbourhood_indexed	9.0
property_indexed	4.0
room_indexed	0.0

amenities_array	[Kitchen, Oven, Microwave, Wifi, Dryer, Carbon monoxide alarm, Stove, Hot water, Extra pillows and blankets, Luggage dropoff allowed, Cooking basics, Private entrance, Smoke alarm, Hair dryer, Lockbox, Dedicated workspace, Iron, Free street parking, Free parking on premises, Coffee maker, Bed linens, Shampoo, Dishes and silverware, Fire extinguisher, Patio or balcony, Children \u2019s books and toys, Hangers, Refrigerator, Essentials, Washer, Long term stays allowed, Pack \u2019n Play/travel crib]
verifications_array	[phone, facebook, offline_government_id, selfie, government_id, identity_manual]
amenities_vector	(20,[0,2,3,4,5,6,7,8,9,11,12,13,14,15,16,17,18,19],[1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,2,3],[1.0,1.0,1.0])
since_year	2009
log_price	5.272999558563747
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	4
bedrooms_imp	2
beds_imp	3
minimum_nights_imp	3
maximum_nights_imp	31
minimum_minimum_nights_imp	3
maximum_minimum_nights_imp	3
minimum_nights_avg_ntm_imp	3.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	9.0
property_indexed_imp	4.0
room_indexed_imp	0.0
gps	[49.27734, -123.04152]
sky_distance	3.500803389031613E-4

-RECORD 2-----

id	17765
host_since	2010/01/07
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Mount Pleasant
host_listings_count	1
host_total_listings_count	1

host_verifications	['phone', 'facebook', 'reviews', 'jumio', 'offline_gover
nment_id', 'selfie', 'government_id']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Mount Pleasant
neighbourhood_group_cleansed	null
latitude	49.26181
longitude	-123.10905
property_type	Entire apartment
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Essentials', 'Washer', 'Long term stays allowed', 'Elevator']
monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Essentials', 'Washer', 'Long term stays allowed', 'Elevato	
r']	
price	94
minimum_nights	3
maximum_nights	60
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	60
maximum_maximum_nights	60
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	60.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	0
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Mount Pleasant
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	5.0
property_indexed	0.0
room_indexed	0.0
amenities_array	[Kitchen, Wifi, Host greets you, Dryer, Carbon monoxide alarm, Hot water, Luggage dropoff allowed, Smoke alarm, Heating, Hair dryer, Dedicated workspace, Iron, Free street parking, Free parking on premises, Coffee maker, Shampoo, Dishes and silverware, Fire extinguisher,
alarm, Hot water, Luggage dropoff allowed, Smoke alarm, Heating, Hair dryer, Dedicated workspace, Iron, Fre	
e street parking, Free parking on premises, Coffee maker, Shampoo, Dishes and silverware, Fire extingui	

Hangers, Essentials, Washer, Long term stays allowed, Elevator]  
verifications\_array | [phone, facebook, reviews, jumio, offline\_government\_id,  
selfie, government\_id]  
amenities\_vector | (20,[0,1,2,3,4,5,6,7,8,9,11,12,13,14,15,16,17],[1.0,1.0,  
1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])  
verifications\_vector | (5,[0,2,3,4],[1.0,1.0,1.0,1.0])  
since\_year | 2010  
log\_price | 4.543294782270004  
host\_listings\_count\_imp | 1  
host\_total\_listings\_count\_imp | 1  
accommodates\_imp | 2  
bedrooms\_imp | 1  
beds\_imp | 1  
minimum\_nights\_imp | 3  
maximum\_nights\_imp | 60  
minimum\_minimum\_nights\_imp | 3  
maximum\_minimum\_nights\_imp | 3  
minimum\_nights\_avg\_ntm\_imp | 3.0  
calculated\_host\_listings\_count\_imp | 1  
calculated\_host\_listings\_count\_entire\_homes\_imp | 1  
calculated\_host\_listings\_count\_private\_rooms\_imp | 0  
neighbourhood\_indexed\_imp | 5.0  
property\_indexed\_imp | 0.0  
room\_indexed\_imp | 0.0  
gps | [49.26181, -123.10905]  
sky\_distance | 3.453697089999319E-5  
-RECORD 3-----

-----

-----

-----

-----

id | 18795  
host\_since | 2010/01/13  
host\_location | Vancouver, British Columbia, Canada  
host\_response\_time | within a day  
host\_response\_rate | 0.7  
host\_acceptance\_rate | 0.4  
host\_is\_superhost | f  
host\_neighbourhood | West End  
host\_listings\_count | 3  
host\_total\_listings\_count | 3  
host\_verifications | ['email', 'phone', 'reviews', 'jumio', 'government\_id']  
host\_has\_profile\_pic | t  
host\_identity\_verified | t  
neighbourhood | null  
neighbourhood\_cleansed | West End

neighbourhood_group_cleansed	null
latitude	49.28251
longitude	-123.12827
property_type	Private room in house
room_type	Private room
accommodates	2
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Cable TV', 'Wifi', 'Essentials', 'Heating', 'Washer', 'Dryer', 'Long term stays allowed']
price	50
minimum_nights	30
maximum_nights	360
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	360
maximum_maximum_nights	360
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	360.0
has_availability	t
availability_30	9
availability_60	20
availability_90	50
availability_365	325
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	3
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	West End
property_reduced	Private room in house
room_reduced	Private room
neighbourhood_indexed	3.0
property_indexed	3.0
room_indexed	1.0
amenities_array	[Kitchen, Cable TV, Wifi, Essentials, Heating, Washer, Dryer, Long term stays allowed]
verifications_array	[email, phone, reviews, jumio, government_id]
amenities_vector	(20,[0,1,3,4,6,7,8],[1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,4],[1.0,1.0,1.0,1.0])
since_year	2010
log_price	3.912023005428146
host_listings_count_imp	3
host_total_listings_count_imp	3
accommodates_imp	2
bedrooms_imp	1
beds_imp	1

minimum_nights_imp	30
maximum_nights_imp	360
minimum_minimum_nights_imp	30
maximum_minimum_nights_imp	30
minimum_nights_avg_ntm_imp	30.0
calculated_host_listings_count_imp	3
calculated_host_listings_count_entire_homes_imp	0
calculated_host_listings_count_private_rooms_imp	3
neighbourhood_indexed_imp	3.0
property_indexed_imp	3.0
room_indexed_imp	1.0
gps	[49.28251, -123.12827]
sky_distance	8.580917161991354E-5
-RECORD 4-	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
-----	
id	21913
host_since	2010/02/22
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	t
host_neighbourhood	Renfrew-Collingwood
host_listings_count	3
host_total_listings_count	3
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'selfie', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Renfrew-Collingwood
neighbourhood_group_cleansed	null
latitude	49.23427
longitude	-123.05309
property_type	Entire house
room_type	Entire home/apt
accommodates	2
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Oven', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Luggage dropoff allowed', 'Private entrance', 'Smoke alarm', 'Heat

ing', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Free parking on premises', 'Coffee maker', 'Bed linens', 'Keypad', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'TV']	
price	80
minimum_nights	28
maximum_nights	400
minimum_minimum_nights	28
maximum_minimum_nights	28
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	28.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	2
availability_60	13
availability_90	43
availability_365	318
instant_bookable	f
calculated_host_listings_count	3
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Renfrew-Collingwood
property_reduced	Entire house
room_reduced	Entire home/apt
neighbourhood_indexed	11.0
property_indexed	2.0
room_indexed	0.0
amenities_array	[Kitchen, Oven, Microwave, Wifi, Dryer, Carbon monoxide alarm, Stove, Hot water, Luggage dropoff allowed, Private entrance, Smoke alarm, Heating, Single level home, Hair dryer, Dedicated workspace, Iron, Free street parking, Free parking on premises, Coffee maker, Bed linens, Keypad, Shampoo, Dishes and silverware, Fire extinguisher, Hangers, Cable TV, Refrigerator, Essentials, Washer, Long term stays allowed, TV]
verifications_array	[email, phone, reviews, offline_government_id, selfie, government_id]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18],[1,0,1,0,1,0,1,0,1,0,1,0,1,0,1,0,1,0,1,0,1,0,1,0,1,0])
verifications_vector	(5,[0,1,2,3,4],[1,0,1,0,1,0,1,0,1,0])
since_year	2010
log_price	4.382026634673881
host_listings_count_imp	3
host_total_listings_count_imp	3
accommodates_imp	2
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	28
maximum_nights_imp	400
minimum_minimum_nights_imp	28
maximum_minimum_nights_imp	28

minimum_nights_avg_ntm_imp	28.0
calculated_host_listings_count_imp	3
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	2
neighbourhood_indexed_imp	11.0
property_indexed_imp	2.0
room_indexed_imp	0.0
gps	[49.23427, -123.05309]
sky_distance	1.492042164098205E-4
-RECORD 5-----	
-----	
-----	
-----	
-----	
id	24273
host_since	2011/10/09
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	0.82
host_is_superhost	f
host_neighbourhood	Kitsilano
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'jumio', 'offline_governme
nt_id', 'government_id']	
host_has_profile_pic	f
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Kitsilano
neighbourhood_group_cleansed	null
latitude	49.2626
longitude	-123.17308
property_type	Entire apartment
room_type	Entire home/apt
accommodates	6
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	3
amenities	['Kitchen', 'Oven', 'Indoor fireplace', 'Microwave', 'Wi
	'fi', 'Dryer', 'Fireplace guards', 'Carbon monoxide alarm', 'Stove', 'Crib', 'Hot water', 'Babysitter recomme
	ndations', 'Garden or backyard', 'Extra pillows and blankets', 'Dishwasher', 'Luggage dropoff allowed', 'Coo
	king basics', 'Room-darkening shades', 'Private entrance', 'Smoke alarm', 'Baking sheet', 'Heating', 'Single
	level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Bathtub', 'Coffee maker',
	'Bed linens', 'Keypad', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Shower gel', 'Patio or ba

lcony', 'Children\u2019s books and toys', 'High chair', 'Hangers', 'Cable TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib', 'TV', 'Ethernet connection']	
price	200
minimum_nights	30
maximum_nights	365
minimum_minimum_nights	30
maximum_minimum_nights	30
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	30.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	0
availability_60	0
availability_90	10
availability_365	223
instant_bookable	f
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Kitsilano
property_reduced	Entire apartment
room_reduced	Entire home/apt
neighbourhood_indexed	2.0
property_indexed	0.0
room_indexed	0.0
amenities_array	[Kitchen, Oven, Indoor fireplace, Microwave, Wifi, Dryer, Fireplace guards, Carbon monoxide alarm, Stove, Crib, Hot water, Babysitter recommendations, Garden or balcony, Extra pillows and blankets, Dishwasher, Luggage dropoff allowed, Cooking basics, Room-darkening shades, Private entrance, Smoke alarm, Baking sheet, Heating, Single level home, Hair dryer, Dedicated workspace, Iron, Free street parking, Bathtub, Coffee maker, Bed linens, Keypad, Shampoo, Fire extinguisher, Dishes and silverware, Shower gel, Patio or balcony, Children\u2019s books and toys, High chair, Hangers, Cable TV, Refrigerator, Essentials, Washer, Long term stays allowed, Pack \u2019n Play/travel crib, TV, Ethernet connection]
verifications_array	[email, phone, reviews, jumio, offline_government_id, government_id]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19], [1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,3,4],[1.0,1.0,1.0,1.0,1.0])
since_year	2011
log_price	5.298317366548036
host_listings_count_imp	2
host_total_listings_count_imp	2
accommodates_imp	6
bedrooms_imp	2
beds_imp	3
minimum_nights_imp	30
maximum_nights_imp	365

minimum_minimum_nights_imp	30
maximum_minimum_nights_imp	30
minimum_nights_avg_ntm_imp	30.0
calculated_host_listings_count_imp	2
calculated_host_listings_count_entire_homes_imp	2
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	2.0
property_indexed_imp	0.0
room_indexed_imp	0.0
gps	[49.2626, -123.17308]
sky_distance	0.0027660990694603196

-RECORD 6-----

-----

-----

-----

-----

id	42645
host_since	2010/04/17
host_location	Vancouver, British Columbia, Canada
host_response_time	within an hour
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	t
host_neighbourhood	Downtown Vancouver
host_listings_count	4
host_total_listings_count	4
host_verifications	['email', 'phone', 'facebook', 'reviews']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.28001
longitude	-123.12475
property_type	Entire condominium
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Oven', 'Paid parking on premises', 'Paid parking off premises', 'Gym', 'Microwave', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Stov e', 'Hot water', 'Dishwasher', 'Luggage dropoff allowed', 'Cooking basics', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'First aid kit', 'Iron', 'Coffee maker', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Patio or balcony', 'Children\u2019s books and toys', 'High chair', 'Hangers', 'Cable

TV', 'Refrigerator', 'Essentials', 'Washer', 'Long term stays allowed', 'Pack \u2019n Play/travel crib', 'TV', 'Elevator']	
price	159
minimum_nights	32
maximum_nights	365
minimum_minimum_nights	32
maximum_minimum_nights	32
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	32.0
maximum_nights_avg_ntm	1125.0
has_availability	t
availability_30	0
availability_60	29
availability_90	59
availability_365	333
instant_bookable	t
calculated_host_listings_count	4
calculated_host_listings_count_entire_homes	4
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	1.0
room_indexed	0.0
amenities_array	[Kitchen, Oven, Paid parking on premises, Paid parking off premises, Gym, Microwave, Wifi, Host greets you, Dryer, Carbon monoxide alarm, Stove, Hot water, Dishwasher, Luggage dropoff allowed, Cooking basics, Smoke alarm, Heating, Hair dryer, Dedicated workspace, First aid kit, Iron, Coffee maker, Shampoo, Fire extinguisher, Dishes and silverware, Patio or balcony, Children\u2019s books and toys, High chair, Hangers, Cable TV, Refrigerator, Essentials, Washer, Long term stays allowed, Pack \u2019n Play/travel crib, TV, Elevator]
verifications_array	[email, phone, facebook, reviews]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19], [1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,4],[1.0,1.0,1.0])
since_year	2010
log_price	5.0689042022202315
host_listings_count_imp	4
host_total_listings_count_imp	4
accommodates_imp	3
bedrooms_imp	1
beds_imp	2
minimum_nights_imp	32
maximum_nights_imp	365
minimum_minimum_nights_imp	32
maximum_minimum_nights_imp	32
minimum_nights_avg_ntm_imp	32.0

calculated_host_listings_count_imp	4
calculated_host_listings_count_entire_homes_imp	4
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	0.0
property_indexed_imp	1.0
room_indexed_imp	0.0
gps	[49.28001, -123.12475]
sky_distance	3.7132247620008065E-5
-RECORD 7-----	
-----	
-----	
-----	
-----	
id	54261
host_since	2010/10/05
host_location	Vancouver, British Columbia, Canada
host_response_time	a few days or more
host_response_rate	0
host_acceptance_rate	N/A
host_is_superhost	f
host_neighbourhood	Downtown Vancouver
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'reviews', 'offline_government_id', 'selfie', 'government_id', 'identity_manual']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Downtown
neighbourhood_group_cleansed	null
latitude	49.27655
longitude	-123.12485
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	1
beds	1
amenities	['Kitchen', 'Hot tub', 'Gym', 'Indoor fireplace', 'Wifi', 'Host greets you', 'Dryer', 'Carbon monoxide alarm', 'Hot water', 'Luggage dropoff allowed', 'Smoke alarm', 'Heating', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free parking on premises', 'Shampoo', 'Fire extinguisher', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Long term stays allowed', 'TV', 'Air conditioning', 'Elevator']
price	126
minimum_nights	90

maximum_nights	365
minimum_minimum_nights	90
maximum_minimum_nights	90
minimum_maximum_nights	365
maximum_maximum_nights	365
minimum_nights_avg_ntm	90.0
maximum_nights_avg_ntm	365.0
has_availability	t
availability_30	30
availability_60	60
availability_90	90
availability_365	365
instant_bookable	f
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	2
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Downtown
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	0.0
property_indexed	1.0
room_indexed	0.0
amenities_array	[Kitchen, Hot tub, Gym, Indoor fireplace, Wifi, Host greets you, Dryer, Carbon monoxide alarm, Hot water, Luggage dropoff allowed, Smoke alarm, Heating, Hair dryer, Dedicated workspace, Iron, Free parking on premises, Shampoo, Fire extinguisher, Hangers, Cable TV, Essentials, Washer, Long term stays allowed, TV, Air conditioning, Elevator]
verifications_array	[email, phone, reviews, offline_government_id, selfie, government_id, identity_manual]
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,17],[1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,3,4],[1.0,1.0,1.0,1.0,1.0])
since_year	2010
log_price	4.836281906951478
host_listings_count_imp	2
host_total_listings_count_imp	2
accommodates_imp	4
bedrooms_imp	1
beds_imp	1
minimum_nights_imp	90
maximum_nights_imp	365
minimum_minimum_nights_imp	90
maximum_minimum_nights_imp	90
minimum_nights_avg_ntm_imp	90.0
calculated_host_listings_count_imp	2
calculated_host_listings_count_entire_homes_imp	2
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	0.0
property_indexed_imp	1.0

room_indexed_imp	0.0
gps	[49.27655, -123.12485]
sky_distance	1.468142545999774E-5
-RECORD 8-----	
-----	
id	72659
host_since	2011/02/03
host_location	Vancouver, British Columbia, Canada
host_response_time	N/A
host_response_rate	N/A
host_acceptance_rate	0
host_is_superhost	f
host_neighbourhood	Commercial Drive
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'reviews', 'jumio', 'government_id']
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	null
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.27357
longitude	-123.07024
property_type	Entire condominium
room_type	Entire home/apt
accommodates	4
bathrooms	null
bathrooms_text	1 bath
bedrooms	2
beds	2
amenities	['Kitchen', 'Lake access', 'Oven', 'Paid parking off pre mises', 'Gym', 'Indoor fireplace', 'Microwave', 'Wifi', 'Dryer', 'Carbon monoxide alarm', 'Stove', 'Hot water', 'Dishwasher', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Smoke alarm', 'Heating', 'Single level home', 'Hair dryer', 'Dedicated workspace', 'Iron', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Dishes and silverware', 'Fire extinguisher', 'Patio or balcony', 'Hangers', 'Refrigerator', 'Essentials', 'Washer', 'BBQ grill', 'TV', 'Elevator']
price	210
minimum_nights	7
maximum_nights	21
minimum_minimum_nights	7
maximum_minimum_nights	7
minimum_maximum_nights	21
maximum_maximum_nights	21

minimum_nights_avg_ntm	7.0
maximum_nights_avg_ntm	21.0
has_availability	t
availability_30	0
availability_60	0
availability_90	0
availability_365	40
instant_bookable	f
calculated_host_listings_count	1
calculated_host_listings_count_entire_homes	1
calculated_host_listings_count_private_rooms	0
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	Grandview-Woodland
property_reduced	Entire condominium
room_reduced	Entire home/apt
neighbourhood_indexed	8.0
property_indexed	1.0
room_indexed	0.0
amenities_array	[Kitchen, Lake access, Oven, Paid parking off premises, Gym, Indoor fireplace, Microwave, Wifi, Dryer, Carbon monoxide alarm, Stove, Hot water, Dishwasher, Extra pillows and blankets, Luggage dropoff allowed, Cooking basics, Smoke alarm, Heating, Single level home, Hair dryer, Dedicated workspace, Iron, Free street parking, Coffee maker, Bed linens, Shampoo, Dishes and silverware, Fire extinguisher, Patio or balcony, Hangers, Refrigerator, Essentials, Washer, BBQ grill, TV, Elevator]
verifications_array	[email, phone, reviews, jumio, government_id]
amenities_vector	(20,[0,1,2,3,4,5,7,8,9,10,11,12,13,14,15,16,17,18,19], [1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,4],[1.0,1.0,1.0,1.0])
since_year	2011
log_price	5.3471075307174685
host_listings_count_imp	1
host_total_listings_count_imp	1
accommodates_imp	4
bedrooms_imp	2
beds_imp	2
minimum_nights_imp	7
maximum_nights_imp	21
minimum_minimum_nights_imp	7
maximum_minimum_nights_imp	7
minimum_nights_avg_ntm_imp	7.0
calculated_host_listings_count_imp	1
calculated_host_listings_count_entire_homes_imp	1
calculated_host_listings_count_private_rooms_imp	0
neighbourhood_indexed_imp	8.0
property_indexed_imp	1.0
room_indexed_imp	0.0
gps	[49.27357, -123.07024]
sky_distance	1.1663483690003356E-4
-RECORD 9-----	

id	77157
host_since	2011/02/27
host_location	Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	1
host_is_superhost	f
host_neighbourhood	Arbutus Ridge
host_listings_count	2
host_total_listings_count	2
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'offl
ine_government_id', 'government_id']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Arbutus Ridge
neighbourhood_group_cleansed	null
latitude	49.24675
longitude	-123.16711
property_type	Private room in guest suite
room_type	Private room
accommodates	3
bathrooms	null
bathrooms_text	1 private bath
bedrooms	1
beds	2
amenities	['Kitchen', 'Microwave', 'Wifi', 'Laundromat nearby', 'Dryer', 'Hot water', 'Garden or backyard', 'Extra pillows and blankets', 'Luggage dropoff allowed', 'Cooking basics', 'Private entrance', 'Smoke alarm', 'Heating', 'Mini fridge', 'Single level home', 'Hair dryer', 'Lockbox', 'Dedicated workspace', 'First aid kit', 'Iron', 'Body soap', 'Free street parking', 'Coffee maker', 'Bed linens', 'Shampoo', 'Fire extinguisher', 'Dishes and silverware', 'Barbecue utensils', 'Shower gel', 'Hangers', 'Cable TV', 'Essentials', 'Washer', 'Conditioner', 'BBQ grill', 'Beach essentials', 'TV', 'Long term stays allowed']
price	75
minimum_nights	3
maximum_nights	60
minimum_minimum_nights	3
maximum_minimum_nights	3
minimum_maximum_nights	1125
maximum_maximum_nights	1125
minimum_nights_avg_ntm	3.0
maximum_nights_avg_ntm	1125.0

has_availability	t
availability_30	3
availability_60	3
availability_90	3
availability_365	267
instant_bookable	t
calculated_host_listings_count	2
calculated_host_listings_count_entire_homes	0
calculated_host_listings_count_private_rooms	2
calculated_host_listings_count_shared_rooms	0
neighbourhood_reduced	OTHER
property_reduced	OTHER
room_reduced	Private room
neighbourhood_indexed	1.0
property_indexed	5.0
room_indexed	1.0
amenities_array	[Kitchen, Microwave, Wifi, Laundromat nearby, Dryer, Hot water, Garden or backyard, Extra pillows and blankets, Luggage dropoff allowed, Cooking basics, Private entrance, Smoke alarm, Heating, Mini fridge, Single level home, Hair dryer, Lockbox, Dedicated workspace, First aid kit, Iron, Body soap, Free street parking, Coffee maker, Bed linens, Shampoo, Fire extinguisher, Dishes and silverware, Barbecue utensils, Shower gel, Hangers, Cable TV, Essentials, Washer, Conditioner, BBQ grill, Beach essentials, TV, Long term stays allowed]
verifications_array	[email, phone, facebook, reviews, jumio, offline_governm
ent_id, government_id]	
amenities_vector	(20,[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,16,17,19],[1.0, 1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0])
verifications_vector	(5,[0,1,2,3,4],[1.0,1.0,1.0,1.0,1.0])
since_year	2011
log_price	4.31748811353631
host_listings_count_imp	2
host_total_listings_count_imp	2
accommodates_imp	3
bedrooms_imp	1
beds_imp	2
minimum_nights_imp	3
maximum_nights_imp	60
minimum_minimum_nights_imp	3
maximum_minimum_nights_imp	3
minimum_nights_avg_ntm_imp	3.0
calculated_host_listings_count_imp	2
calculated_host_listings_count_entire_homes_imp	0
calculated_host_listings_count_private_rooms_imp	2
neighbourhood_indexed_imp	1.0
property_indexed_imp	5.0
room_indexed_imp	1.0
gps	[49.24675, -123.16711]
sky_distance	0.0026776233901299497
-RECORD 10-----	

id	111077
host_since	2011/05/09
host_location	North Vancouver, British Columbia, Canada
host_response_time	within a few hours
host_response_rate	1
host_acceptance_rate	0.33
host_is_superhost	f
host_neighbourhood	Grandview-Woodland
host_listings_count	1
host_total_listings_count	1
host_verifications	['email', 'phone', 'facebook', 'reviews', 'jumio', 'gove
rnment_id']	
host_has_profile_pic	t
host_identity_verified	t
neighbourhood	Vancouver, British Columbia, Canada
neighbourhood_cleansed	Grandview-Woodland
neighbourhood_group_cleansed	null
latitude	49.26726
longitude	-123.05969
property_type	Entire guest suite
room_type	Entire home/apt
accommodates	3
bathrooms	null
bathrooms_text	1 bath
bedrooms	2