# AIRBNB PROJECT

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IST652 Scripting for Data Analysis

Final Project Presentation

# Agenda

**Analysis Question & Description**

**Findings & Visualization**

**Analysis Result**

# Analysis Question & Description

### Analysis Question

Do city and type of AirBnB in the U.S. affect the price?

Do metro distance and type of AirBnB in Europe affect the price and guest satisfaction?

### Data: 2 sets from Kaggle

AirBnB European Data

AirBnB American Data

### Variables of interest:

Daily rates

City names or locations

Number of reviews/guest satisfaction ratings

Room types

# Analysis Question & Description

- Program Description

| | host_id | latitude | longitude | price | number_of_reviews | availability_365 |
|---|---|---|---|---|---|---|
| count | 2.321470e+05 | 232147.000000 | 232147.000000 | 232147.000000 | 232147.000000 | 232147.000000 |
| mean | 1.582248e+08 | 36.610585 | -98.301436 | 259.468001 | 40.915230 | 180.985686 |
| std | 1.587164e+08 | 5.126523 | 19.706929 | 1024.645918 | 80.649152 | 134.715299 |
| min | 2.300000e+01 | 25.957323 | -123.089130 | 0.000000 | 0.000000 | 0.000000 |
| 25% | 2.299242e+07 | 33.976225 | -118.315111 | 91.000000 | 1.000000 | 52.000000 |
| 50% | 1.005783e+08 | 36.190556 | -97.727670 | 149.000000 | 9.000000 | 175.000000 |
| 75% | 2.686930e+08 | 40.717440 | -77.026222 | 250.000000 | 43.000000 | 321.000000 |
| max | 5.069384e+08 | 47.734010 | -70.996000 | 100000.000000 | 3091.000000 | 365.000000 |

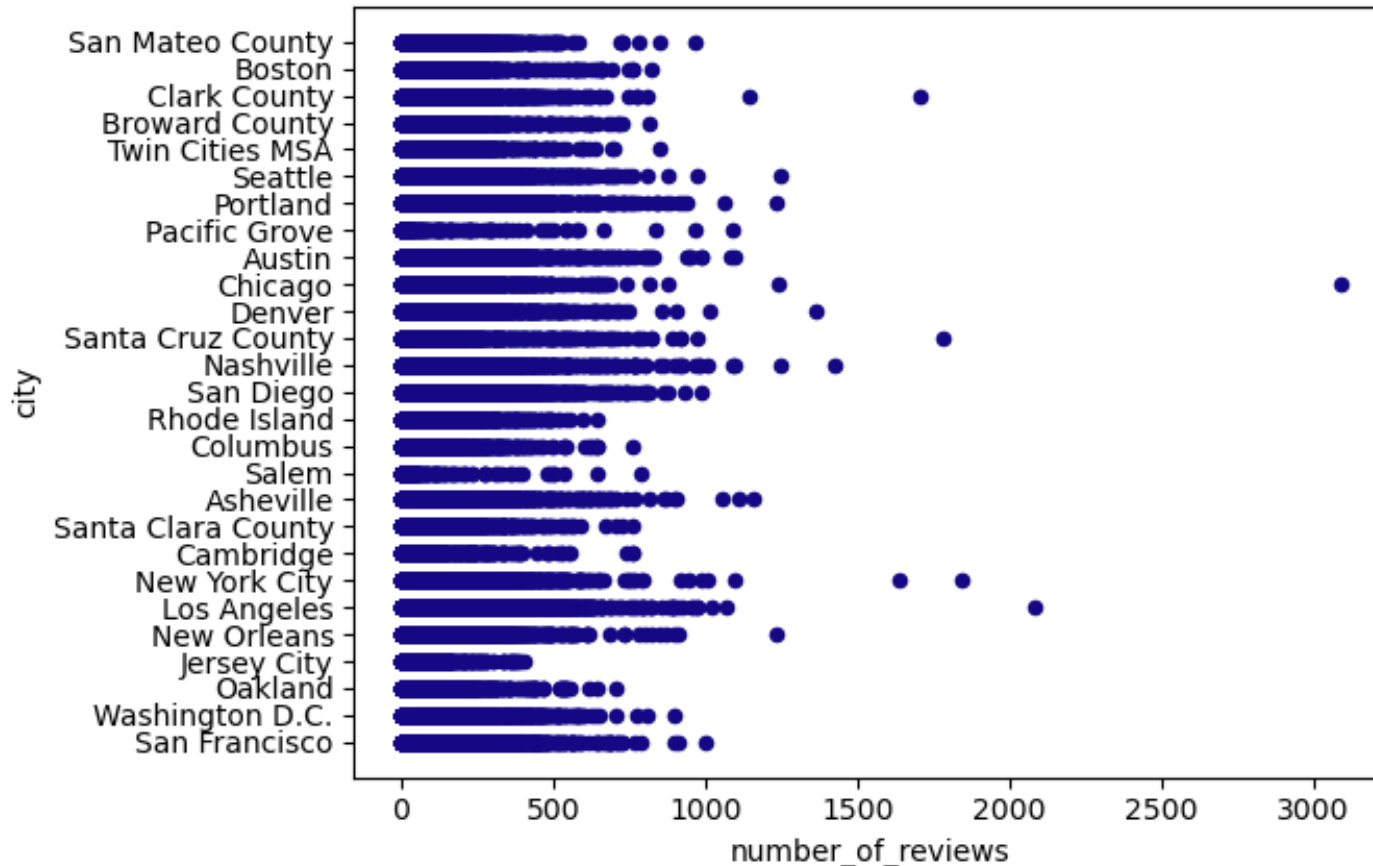| | realSum | dist | metro_dist | longitude | latitude | guest_satisfaction_overall |
|---|---|---|---|---|---|---|
| count | 10050.000000 | 10050.000000 | 10050.000000 | 10050.000000 | 10050.000000 | 10050.000000 |
| mean | 303.018906 | 2.951927 | 0.682353 | 11.200455 | 45.510609 | 93.661990 |
| std | 380.541268 | 2.629266 | 0.807088 | 8.596107 | 6.448178 | 7.834318 |
| min | 42.884259 | 0.015045 | 0.011376 | 2.093470 | 37.953000 | 20.000000 |
| 25% | 138.963748 | 1.282236 | 0.290613 | 2.191620 | 38.004900 | 91.000000 |
| 50% | 202.480974 | 2.163782 | 0.451914 | 13.285915 | 41.409460 | 96.000000 |
| 75% | 356.133075 | 3.677596 | 0.769645 | 23.712340 | 52.408450 | 99.000000 |
| max | 18545.450280 | 25.284557 | 14.273577 | 23.786020 | 52.641410 | 100.000000 |

# Analysis Question & Description
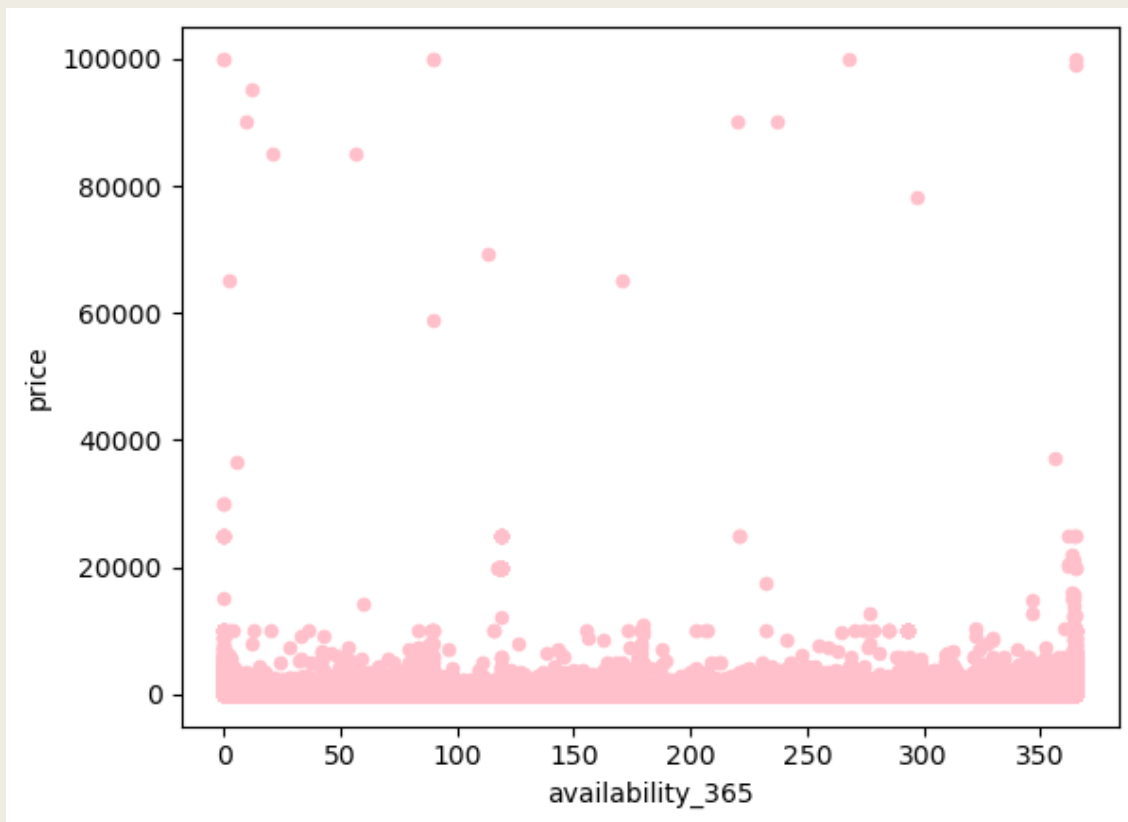
- Correlation Analysis

|  | host_id | latitude | longitude | price | number_of_reviews | availability_365 |
|---|---|---|---|---|---|---|
| host_id | 1.000000 | -0.063122 | 0.015425 | 0.020140 | -0.184252 | 0.158353 |
| latitude | -0.063122 | 1.000000 | 0.129898 | -0.041702 | 0.035587 | -0.077012 |
| longitude | 0.015425 | 0.129898 | 1.000000 | -0.023272 | -0.051300 | -0.076190 |
| price | 0.020140 | -0.041702 | -0.023272 | 1.000000 | -0.035233 | 0.015663 |
| number_of_reviews | -0.184252 | 0.035587 | -0.051300 | -0.035233 | 1.000000 | -0.027564 |
| availability_365 | 0.158353 | -0.077012 | -0.076190 | 0.015663 | -0.027564 | 1.000000 |

|  | realSum | dist | metro_dist | longitude | latitude | guest_satisfaction_overall |
|---|---|---|---|---|---|---|
| realSum | 1.000000 | -0.084332 | 0.032371 | -0.259300 | 0.238624 | 0.023967 |
| dist | -0.084332 | 1.000000 | 0.531055 | -0.014682 | 0.418022 | 0.037298 |
| metro_dist | 0.032371 | 0.531055 | 1.000000 | -0.073593 | 0.294401 | 0.044499 |
| longitude | -0.259300 | -0.014682 | -0.073593 | 1.000000 | -0.353197 | 0.155944 |
| latitude | 0.238624 | 0.418022 | 0.294401 | -0.353197 | 1.000000 | 0.048632 |
| guest_satisfaction_overall | 0.023967 | 0.037298 | 0.044499 | 0.155944 | 0.048632 | 1.000000 |

# FINDINGS & VISUALIZATION

Scatter Plot – number of reviews in U.S. cities

| | host_id | latitude | longitude | price | number_of_reviews | availability_365 |
|---|---|---|---|---|---|---|
| count | 2.321470e+05 | 232147.000000 | 232147.000000 | 232147.000000 | 232147.000000 | 232147.000000 |
| mean | 1.582248e+08 | 36.610585 | -98.301436 | 259.468001 | 40.915230 | 180.985686 |
| std | 1.587164e+08 | 5.126523 | 19.706929 | 1024.645918 | 80.649152 | 134.715299 |
| min | 2.300000e+01 | 25.957323 | -123.089130 | 0.000000 | 0.000000 | 0.000000 |
| 25% | 2.299242e+07 | 33.976225 | -118.315111 | 91.000000 | 1.000000 | 52.000000 |
| 50% | 1.005783e+08 | 36.190556 | -97.727670 | 149.000000 | 9.000000 | 175.000000 |
| 75% | 2.686930e+08 | 40.717440 | -77.026222 | 250.000000 | 43.000000 | 321.000000 |
| max | 5.069384e+08 | 47.734010 | -70.996000 | 100000.000000 | 3091.000000 | 365.000000 |

# FINDINGS & VISUALIZATION

Scatter Plot – availability and price in the U.S

| room_type city | Entire home/apt | Hotel room | Private room | Shared room |
|---|---|---|---|---|
| Asheville | 179.196071 | 442.125000 | 136.542416 | 65.428571 |
| Austin | 339.170272 | 786.750000 | 176.553579 | 71.055046 |
| Boston | 235.588608 | 546.333333 | 98.942263 | 59.375000 |
| Broward County | 334.289677 | 210.000000 | 190.506276 | 50.672897 |
| Cambridge | 238.016393 | 0.000000 | 108.802920 | 128.200000 |
| Chicago | 210.926607 | 141.440000 | 90.709251 | 45.847222 |
| Clark County | 286.644628 | 1754.788845 | 772.248985 | 172.784615 |
| Columbus | 144.178314 | 49.142857 | 63.471503 | 35.400000 |
| Denver | 185.394106 | 105.153846 | 94.339355 | 44.111111 |
| Jersey City | 323.630715 | 111.727273 | 69.225446 | 75.000000 |
| Los Angeles | 345.241565 | 633.795181 | 142.274548 | 87.205165 |
| Nashville | 289.578158 | 738.533333 | 198.668757 | 153.000000 |
| New Orleans | 260.016177 | 239.586957 | 309.658670 | 54.085714 |
| New York City | 249.255365 | 309.959391 | 135.015046 | 126.250000 |
| Oakland | 212.329670 | 99.000000 | 87.142857 | 33.562500 |
| Pacific Grove | 300.210843 | 164.666667 | 281.904762 | 0.000000 |
| Portland | 138.281307 | 105.095238 | 113.968100 | 42.250000 |
| Rhode Island | 384.871318 | 326.058824 | 157.343713 | 154.666667 |
| Salem | 186.427778 | 0.000000 | 72.311321 | 397.500000 |
| San Diego | 330.562512 | 82.200000 | 205.738268 | 199.222222 |
| San Francisco | 271.691341 | 945.365385 | 429.480712 | 239.074627 |
| San Mateo County | 263.126687 | 0.000000 | 219.662500 | 42.372881 |
| Santa Clara County | 239.190939 | 0.000000 | 134.364111 | 69.646154 |
| Santa Cruz County | 329.564422 | 475.200000 | 216.115830 | 83.000000 |
| Seattle | 175.549693 | 0.000000 | 87.883316 | 67.933333 |
| Twin Cities MSA | 270.211755 | 154.181818 | 122.493266 | 313.300000 |
| Washington D.C. | 207.906173 | 68.105263 | 132.989130 | 54.990385 |

# FINDINGS & VISUALIZATION
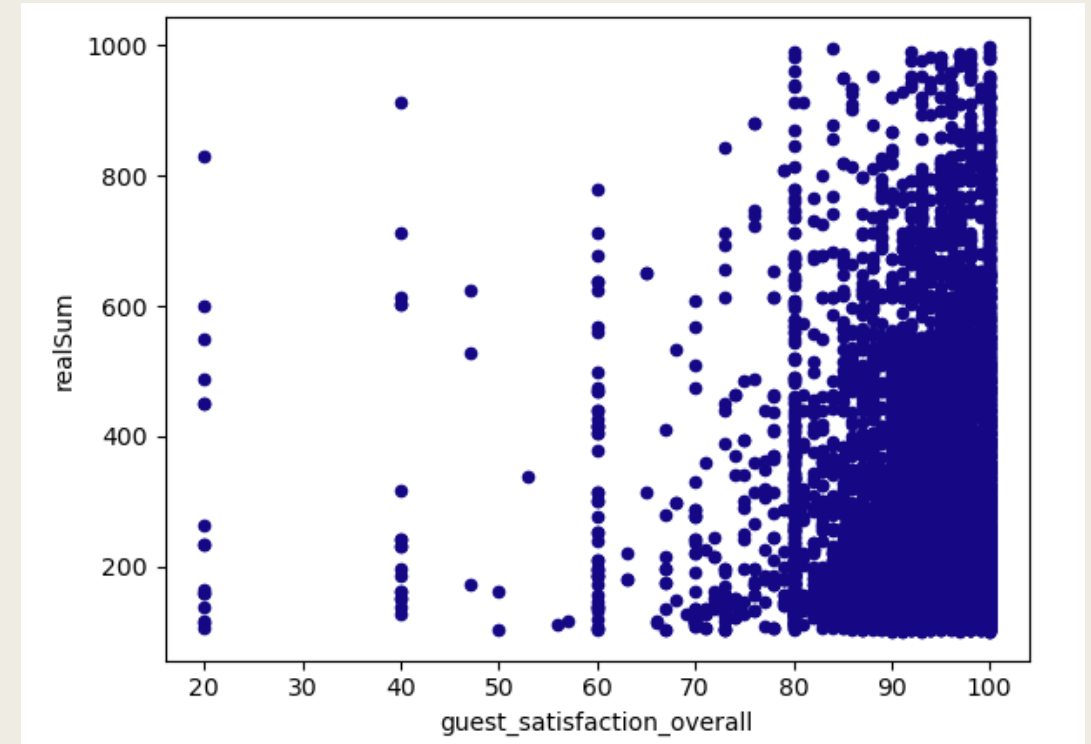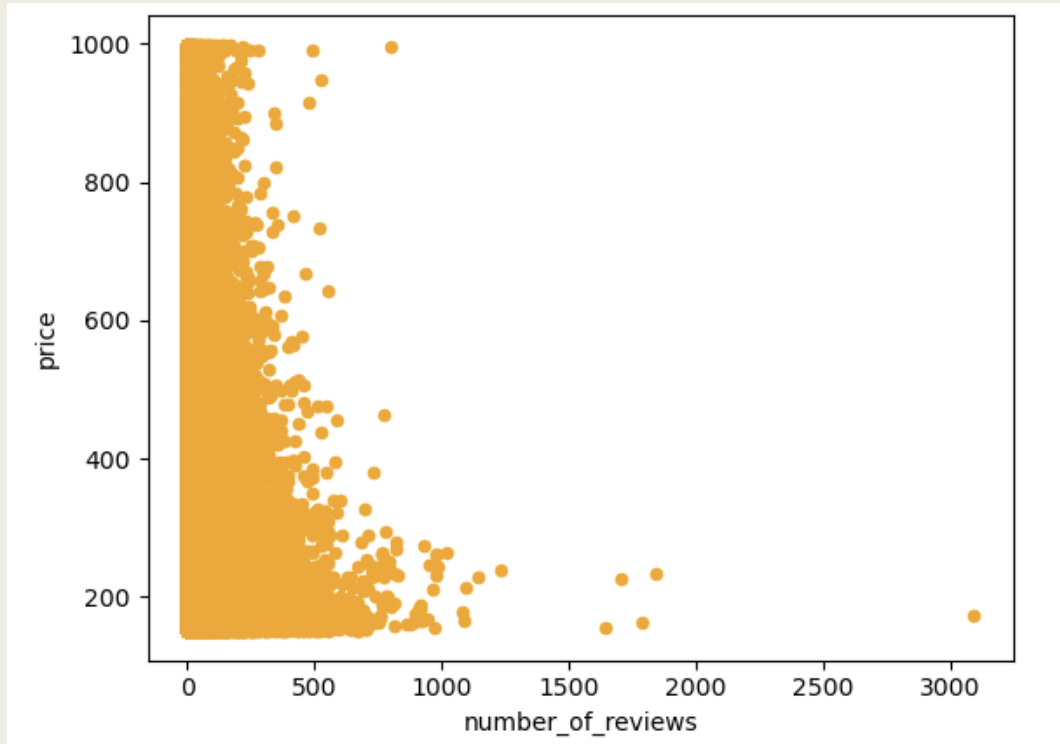
Average price by type of AirBnB and city in the U.S.

| room_type guest_satisfaction_overall | Entire home/apt | Private room | Shared room |
|---|---|---|---|
| 20 | 225.774598 | 327.252405 | 0.000000 |
| 40 | 364.781275 | 200.659223 | 0.000000 |
| 47 | 173.177419 | 576.476929 | 0.000000 |
| 50 | 132.167881 | 0.000000 | 0.000000 |
| 53 | 337.933763 | 0.000000 | 0.000000 |
| 56 | 111.077262 | 0.000000 | 0.000000 |
| 57 | 115.998407 | 0.000000 | 0.000000 |
| 60 | 369.006814 | 250.385233 | 81.097504 |
| 63 | 0.000000 | 192.938767 | 0.000000 |
| 64 | 1620.080527 | 0.000000 | 0.000000 |
| 65 | 538.342791 | 98.214909 | 0.000000 |
| 66 | 0.000000 | 114.622850 | 0.000000 |
| 67 | 170.662088 | 227.655332 | 101.664018 |
| 68 | 376.853611 | 148.020574 | 0.000000 |
| 69 | 0.000000 | 125.268767 | 0.000000 |
| 70 | 277.223199 | 156.132148 | 0.000000 |
| 71 | 358.647334 | 136.061360 | 0.000000 |
| 72 | 116.154633 | 180.237990 | 0.000000 |
| 73 | 337.621237 | 237.807595 | 0.000000 |
| 74 | 409.902549 | 137.004368 | 0.000000 |
| 75 | 337.858737 | 201.689471 | 0.000000 |
| 76 | 595.314855 | 217.490794 | 0.000000 |
| 77 | 223.387398 | 167.350122 | 0.000000 |
| 78 | 321.369028 | 326.362669 | 0.000000 |
| 79 | 457.878513 | 160.514868 | 0.000000 |
| 80 | 385.828970 | 260.857068 | 137.547564 |

| | | | |
|---|---|---|---|
| 80 | 385.828970 | 260.857068 | 137.547564 |
| 81 | 496.428750 | 218.498769 | 0.000000 |
| 82 | 459.093301 | 206.216945 | 0.000000 |
| 83 | 339.206341 | 217.313972 | 143.176254 |
| 84 | 881.538645 | 189.534685 | 134.873879 |
| 85 | 417.077810 | 195.322636 | 0.000000 |
| 86 | 375.862104 | 220.377698 | 155.417407 |
| 87 | 582.475517 | 200.632918 | 131.521269 |
| 88 | 339.559953 | 234.760635 | 135.475119 |
| 89 | 358.345890 | 198.743435 | 132.378454 |
| 90 | 369.567531 | 224.228903 | 154.790725 |
| 91 | 337.540626 | 210.519026 | 141.722722 |
| 92 | 384.669585 | 219.620512 | 147.782867 |
| 93 | 339.391015 | 223.119957 | 152.215816 |
| 94 | 329.399985 | 218.163188 | 142.830361 |
| 95 | 375.346267 | 241.706034 | 159.068161 |
| 96 | 394.149468 | 248.286897 | 206.568352 |
| 97 | 353.126491 | 234.143548 | 145.757377 |
| 98 | 371.292744 | 236.077717 | 226.431669 |
| 99 | 337.649935 | 247.036867 | 81.331214 |
| 100 | 385.897272 | 250.507418 | 301.544826 |

# FINDINGS & VISUALIZATION

Average price by guest satisfaction rating by type of AirBnB in Europe

# FINDINGS & VISUALIZATION

Scatter Plot – number of reviews and price in US vs Europe

| room_type | Entire home/apt | Hotel room | Private room | Shared room |
|---|---|---|---|---|
| number_of_reviews | | | | |
| 0 | 390.449019 | 1439.427083 | 369.990484 | 106.942590 |
| 1 | 293.510660 | 1265.011905 | 160.032293 | 124.373984 |
| 2 | 271.446247 | 588.025641 | 119.579863 | 80.729323 |
| 3 | 270.448254 | 765.241379 | 138.529918 | 81.000000 |
| 4 | 283.553101 | 349.565217 | 119.923836 | 72.298507 |
| ... | ... | ... | ... | ... |
| 1705 | 0.000000 | 0.000000 | 226.000000 | 0.000000 |
| 1784 | 164.000000 | 0.000000 | 0.000000 | 0.000000 |
| 1842 | 234.000000 | 0.000000 | 0.000000 | 0.000000 |
| 2084 | 116.000000 | 0.000000 | 0.000000 | 0.000000 |
| 3091 | 0.000000 | 173.000000 | 0.000000 | 0.000000 |

| room_type | Entire home/apt | Private room | Shared room |
|---|---|---|---|
| metro_dist | | | |
| 0.011376 | 0.000000 | 254.978031 | 0.0 |
| 0.011382 | 0.000000 | 254.978031 | 0.0 |
| 0.012994 | 0.000000 | 196.895292 | 0.0 |
| 0.013004 | 0.000000 | 196.895292 | 0.0 |
| 0.014944 | 0.000000 | 381.921009 | 0.0 |
| ... | ... | ... | ... |
| 9.598773 | 201.692063 | 0.000000 | 0.0 |
| 13.069964 | 227.166495 | 0.000000 | 0.0 |
| 13.314108 | 155.417407 | 0.000000 | 0.0 |
| 13.314115 | 160.091614 | 0.000000 | 0.0 |
| 14.273577 | 359.680284 | 0.000000 | 0.0 |

# FINDINGS & VISUALIZATION

Average price by room type and number of reviews in the U.S.

Average price by room type and distance to/from metro stations

# Analysis Results

🚆 Metro distance does affect the type of AirBnB in Europe

🏢 Type of cities does impact the number of reviews in the U.S.

💵 Availability affects the price in the U.S.

★★★ The higher the price, the lower the guest satisfaction in Europe

🗣 Price impacts number of reviews

THANK YOU