

**UJIAN TENGAH SEMESTER  
KECERDASAN BUATAN**



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**PROGRAM STUDI D4-TEKNOLOGI REKAYASA KOMPUTER  
JURUSAN TEKNIK ELEKTRO  
POLITEKNIK NEGERI SEMARANG  
2024/2025**

## A. ALAT DAN BAHAN PRAKTIKUM

- Laptop
- Jupyter Notebook VS Code

Note : Saya menggunakan Jupyter Notebook yang dihubungkan ke VS Code

## B. HASIL UJIAN TENGAH SEMESTER

### 1. Load Dataset

```
df_airbnb = pd.read_csv('../JOBSHEET/UTS/airbnb.csv')
df_airbnb.head()
```

|   | id   | name  | host_id | host_name   | neighbourhood_group | neighbourhood | latitude | longitude | room_type       | price | minimum_nights | number_of_reviews | last_review | reviews_per_month | calculated_host_listings_count | availability_365 |
|---|------|---|---------|-------------|---------------------|---------------|----------|-----------|-----------------|-------|----------------|-------------------|-------------|-------------------|--------------------------------|------------------|
| 0 | 2539 | Clean & quiet apt home by the park              | 2787    | John        | Brooklyn            | Kensington    | 40.64749 | -73.97237 | Private room    | 149   | 1              | 9                 | 2018-10-19  | 0.21              | 6                              | 365              |
| 1 | 2595 | Stylish Midtown Castle                          | 2845    | Jennifer    | Manhattan           | Midtown       | 40.75362 | -73.98377 | Entire home/apt | 225   | 1              | 45                | 2019-05-21  | 0.38              | 2                              | 355              |
| 2 | 3647 | THE VILLAGE OF HARLEM-NEW YORK 1                | 4632    | Elisabeth   | Manhattan           | Harlem        | 40.80902 | -73.94190 | Private room    | 150   | 3              | 0                 | NaN         | NaN               | 1                              | 365              |
| 3 | 3831 | Cozy Entire Floor of Brownstone                 | 4869    | LisaRosanne | Brooklyn            | Clinton Hill  | 40.68514 | -73.95976 | Entire home/apt | 89    | 1              | 270               | 2019-07-05  | 4.64              | 1                              | 194              |
| 4 | 5022 | Entire Apt Spacious Studio/Loft by central park | 7192    | Laura       | Manhattan           | East Harlem   | 40.79851 | -73.94399 | Entire home/apt | 80    | 10             | 9                 | 2018-11-19  | 0.10              | 1                              | 0                |

Menampilkan dataset dengan menggunakan `pandas.read_csv()`

### 2. Check Data Info

```
df_airbnb.dtypes
```

|                                |         |
|--------------------------------|---------|
| id                             | int64   |
| name                           | object  |
| host_id                        | int64   |
| host_name                      | object  |
| neighbourhood_group            | object  |
| neighbourhood                  | object  |
| latitude                       | float64 |
| longitude                      | float64 |
| room_type                      | object  |
| price                          | int64   |
| minimum_nights                 | int64   |
| number_of_reviews              | int64   |
| last_review                    | object  |
| reviews_per_month              | float64 |
| calculated_host_listings_count | int64   |
| availability_365               | int64   |
| dtype:                         | object  |

Mengecek info dari dataset menggunakan “dtypes”

### 3. Check Total Null pada setiap Kolom

```
df_airbnb.isnull().sum()

[8] ✓ 0.0s

.. id                0
   name              16
   host_id           0
   host_name        21
   neighbourhood_group 0
   neighbourhood     0
   latitude          0
   longitude         0
   room_type         0
   price             0
   minimum_nights    0
   number_of_reviews 0
   last_review      10052
   reviews_per_month 10052
   calculated_host_listings_count 0
   availability_365   0
   dtype: int64
```

Mengecek value null dengan cara `.isnull()` untuk mengecek apakah ada null di kolom tersebut, lalu `.sum()` untuk menghitung total value Null

### 4. Mengecek Info Baris dan Kolom

```
x, y = df_airbnb.shape
print(f'Total Baris : {x}')
print(f'Total Kolom : {y}')

✓ 0.0s

Total Baris : 48895
Total Kolom : 16
```

Mengecek total baris dan kolom menggunakan fungsi `.shape` lalu value dari shape disimpan didalam variabel x dan y

## 5. Mengganti Value Null dengan angka 0

```
df_airbnb.fillna(0).head(10)
```

|   | id   | name   | host_id | host_name    | neighbourhood_group | neighbourhood      | latitude | longitude | room_type       | price | minimum_nights | number_of_reviews | last_review         | reviews_per_month | calculated_host_listings_count | availability_365 | year   | month |
|---|------|--|---------|--------------|---------------------|--------------------|----------|-----------|-----------------|-------|----------------|-------------------|---------------------|-------------------|--------------------------------|------------------|--------|-------|
| 0 | 2539 | Clean & quiet apt home by the park               | 2787    | John         | Brooklyn            | Kensington         | 40.64749 | -73.97237 | Private room    | 149   | 1              | 9                 | 2018-10-19 00:00:00 | 0.21              | 6                              | 365              | 2018.0 | 10.0  |
| 1 | 2595 | Stylish Midtown Castle                           | 2845    | Jennifer     | Manhattan           | Midtown            | 40.75362 | -73.98377 | Entire home/apt | 225   | 1              | 45                | 2019-05-21 00:00:00 | 0.38              | 2                              | 355              | 2019.0 | 5.0   |
| 2 | 3647 | THE VILLAGE OF HARLEM-NEW YORK 1                 | 4632    | Elizabeth    | Manhattan           | Harlem             | 40.80902 | -73.94190 | Private room    | 150   | 3              | 0                 | 0                   | 0.00              | 1                              | 365              | 0.0    | 0.0   |
| 3 | 3831 | Cozy Entire Floor of Brownstone                  | 4869    | Lisa/Roxanne | Brooklyn            | Clinton Hill       | 40.68514 | -73.95976 | Entire home/apt | 89    | 1              | 270               | 2019-07-05 00:00:00 | 4.64              | 1                              | 194              | 2019.0 | 7.0   |
| 4 | 5022 | Entire Apt: Spacious Studio/Loft by central park | 7182    | Laura        | Manhattan           | East Harlem        | 40.79851 | -73.94399 | Entire home/apt | 80    | 10             | 9                 | 2018-11-19 00:00:00 | 0.10              | 1                              | 0                | 2018.0 | 11.0  |
| 5 | 5099 | Large Cozy 1 BR Apartment in Midtown East        | 7322    | Chris        | Manhattan           | Murray Hill        | 40.74767 | -73.97500 | Entire home/apt | 200   | 3              | 74                | 2019-06-22 00:00:00 | 0.59              | 1                              | 129              | 2019.0 | 6.0   |
| 6 | 5121 | BlissfulSpace!                                   | 7356    | Garon        | Brooklyn            | Bedford-Stuyvesant | 40.68688 | -73.95596 | Private room    | 60    | 43             | 49                | 2017-10-05 00:00:00 | 0.40              | 1                              | 0                | 2017.0 | 10.0  |
| 7 | 5178 | Large Furnished Room Near E'way                  | 8967    | Shunichi     | Manhattan           | Hell's Kitchen     | 40.76489 | -73.98493 | Private room    | 79    | 2              | 430               | 2019-06-24 00:00:00 | 3.47              | 1                              | 220              | 2019.0 | 6.0   |
| 8 | 5203 | Cozy Clean Guest Room - Family Apt               | 7490    | MaryEllen    | Manhattan           | Upper West Side    | 40.80178 | -73.96723 | Private room    | 79    | 2              | 118               | 2017-07-21 00:00:00 | 0.99              | 1                              | 0                | 2017.0 | 7.0   |
| 9 | 5238 | Cute & Cozy Lower East Side 1 bdrm               | 7549    | Ben          | Manhattan           | Chinatown          | 40.71344 | -73.99037 | Entire home/apt | 150   | 1              | 160               | 2019-06-09 00:00:00 | 1.33              | 4                              | 188              | 2019.0 | 6.0   |

Fungsi .fillna() dapat mengisi semua kolom yang terdapat value null.

Dengan mengisi angka 0 didalam kurung fillna() maka semua value null akan diisi dengan 0

## 6. Mengganti tipe kolom 'last\_review' menjadi datetime

```
df_airbnb['last_review'] = pd.to_datetime(df_airbnb['last_review'], errors='coerce')
```

```
df_airbnb.head(10)
```

|   | id   | name   | host_id | host_name    | neighbourhood_group | neighbourhood      | latitude | longitude | room_type       | price | minimum_nights | number_of_reviews | last_review | reviews_per_month | calculated_host_listings_count | availability_365 | year   | month |
|---|------|--|---------|--------------|---------------------|--------------------|----------|-----------|-----------------|-------|----------------|-------------------|-------------|-------------------|--------------------------------|------------------|--------|-------|
| 0 | 2539 | Clean & quiet apt home by the park               | 2787    | John         | Brooklyn            | Kensington         | 40.64749 | -73.97237 | Private room    | 149   | 1              | 9                 | 2018-10-19  | 0.21              | 6                              | 365              | 2018.0 | 10.0  |
| 1 | 2595 | Stylish Midtown Castle                           | 2845    | Jennifer     | Manhattan           | Midtown            | 40.75362 | -73.98377 | Entire home/apt | 225   | 1              | 45                | 2019-05-21  | 0.38              | 2                              | 355              | 2019.0 | 5.0   |
| 2 | 3647 | THE VILLAGE OF HARLEM-NEW YORK 1                 | 4632    | Elizabeth    | Manhattan           | Harlem             | 40.80902 | -73.94190 | Private room    | 150   | 3              | 0                 | NaT         | NaN               | 1                              | 365              | NaN    | NaN   |
| 3 | 3831 | Cozy Entire Floor of Brownstone                  | 4869    | Lisa/Roxanne | Brooklyn            | Clinton Hill       | 40.68514 | -73.95976 | Entire home/apt | 89    | 1              | 270               | 2019-07-05  | 4.64              | 1                              | 194              | 2019.0 | 7.0   |
| 4 | 5022 | Entire Apt: Spacious Studio/Loft by central park | 7182    | Laura        | Manhattan           | East Harlem        | 40.79851 | -73.94399 | Entire home/apt | 80    | 10             | 9                 | 2018-11-19  | 0.10              | 1                              | 0                | 2018.0 | 11.0  |
| 5 | 5099 | Large Cozy 1 BR Apartment in Midtown East        | 7322    | Chris        | Manhattan           | Murray Hill        | 40.74767 | -73.97500 | Entire home/apt | 200   | 3              | 74                | 2019-06-22  | 0.59              | 1                              | 129              | 2019.0 | 6.0   |
| 6 | 5121 | BlissfulSpace!                                   | 7356    | Garon        | Brooklyn            | Bedford-Stuyvesant | 40.68688 | -73.95596 | Private room    | 60    | 43             | 49                | 2017-10-05  | 0.40              | 1                              | 0                | 2017.0 | 10.0  |
| 7 | 5178 | Large Furnished Room Near E'way                  | 8967    | Shunichi     | Manhattan           | Hell's Kitchen     | 40.76489 | -73.98493 | Private room    | 79    | 2              | 430               | 2019-06-24  | 3.47              | 1                              | 220              | 2019.0 | 6.0   |
| 8 | 5203 | Cozy Clean Guest Room - Family Apt               | 7490    | MaryEllen    | Manhattan           | Upper West Side    | 40.80178 | -73.96723 | Private room    | 79    | 2              | 118               | 2017-07-21  | 0.99              | 1                              | 0                | 2017.0 | 7.0   |
| 9 | 5238 | Cute & Cozy Lower East Side 1 bdrm               | 7549    | Ben          | Manhattan           | Chinatown          | 40.71344 | -73.99037 | Entire home/apt | 150   | 1              | 160               | 2019-06-09  | 1.33              | 4                              | 188              | 2019.0 | 6.0   |

Kolom last\_review dapat diganti jenisnya menjadi datetime supaya memudahkan kita untuk mengambil data tanggal dari review tersebut

## 7. Menambahkan kolom 'year' dan 'month' berdasarkan data tanggal last\_review

```
df.airbnb['year'] = df.airbnb['last_review'].dt.year
df.airbnb['month'] = df.airbnb['last_review'].dt.month
df.airbnb.head(10)
```

|   | id   | name   | host_id | host_name     | neighbourhood_group | neighbourhood      | latitude | longitude | room_type       | price | minimum_nights | number_of_reviews | last_review | reviews_per_month | calculated_host_listings_count | availability_365 | year   | month |
|---|------|--|---------|---------------|---------------------|--------------------|----------|-----------|-----------------|-------|----------------|-------------------|-------------|-------------------|--------------------------------|------------------|--------|-------|
| 0 | 2539 | Clean & quiet apt home by the park               | 2787    | John          | Brooklyn            | Kensington         | 40.64749 | -73.97237 | Private room    | 149   | 1              | 9                 | 2018-10-19  | 0.21              | 6                              | 365              | 2018.0 | 10.0  |
| 1 | 2595 | Stylish Midtown Castle                           | 2845    | Jennifer      | Manhattan           | Midtown            | 40.75362 | -73.98377 | Entire home/apt | 225   | 1              | 45                | 2019-05-21  | 0.38              | 2                              | 355              | 2019.0 | 5.0   |
| 2 | 3647 | THE VILLAGE OF HARLEM, NEW YORK!                 | 4632    | Elisabeth     | Manhattan           | Harlem             | 40.80902 | -73.94190 | Private room    | 150   | 3              | 0                 | NaT         | NaN               | 1                              | 365              | NaN    | NaN   |
| 3 | 3831 | Cozy Entire Floor of Brownstone                  | 4869    | Lisa/Isabelle | Brooklyn            | Clinton Hill       | 40.68514 | -73.95976 | Entire home/apt | 89    | 1              | 270               | 2019-07-05  | 4.64              | 1                              | 194              | 2019.0 | 7.0   |
| 4 | 5022 | Entire Apt. Spacious Studio/Loft by central park | 7192    | Laura         | Manhattan           | East Harlem        | 40.79851 | -73.94399 | Entire home/apt | 80    | 10             | 9                 | 2018-11-19  | 0.10              | 1                              | 0                | 2018.0 | 11.0  |
| 5 | 5099 | Large Cozy 1 BR Apartment in Midtown East        | 7322    | Chris         | Manhattan           | Murray Hill        | 40.74767 | -73.97500 | Entire home/apt | 200   | 3              | 74                | 2019-06-22  | 0.59              | 1                              | 129              | 2019.0 | 6.0   |
| 6 | 5121 | BlueArtSpace!                                    | 7356    | Geron         | Brooklyn            | Bedford-Stuyvesant | 40.68668 | -73.95596 | Private room    | 60    | 45             | 49                | 2017-10-05  | 0.40              | 1                              | 0                | 2017.0 | 10.0  |
| 7 | 5178 | Large Furnished Room Near E'way                  | 8967    | Shunichi      | Manhattan           | Hell's Kitchen     | 40.76489 | -73.98493 | Private room    | 79    | 2              | 430               | 2019-06-24  | 3.47              | 1                              | 220              | 2019.0 | 6.0   |
| 8 | 5203 | Cozy Clean Guest Room Family Apt                 | 7480    | MaryEllen     | Manhattan           | Upper West Side    | 40.80178 | -73.96723 | Private room    | 79    | 2              | 118               | 2017-07-21  | 0.99              | 1                              | 0                | 2017.0 | 7.0   |
| 9 | 5238 | Cute & Cozy Lower East Side 1 bdrm               | 7549    | Ben           | Manhattan           | Chinatown          | 40.71344 | -73.99037 | Entire home/apt | 150   | 1              | 160               | 2019-06-09  | 1.33              | 4                              | 188              | 2019.0 | 6.0   |

Menambahkan kolom year dan month dengan cara memanggil fungsi .dt.year dan .dt.month untuk mengambil value tahun dan bulan

## 8. Membuat DataFrame baru dengan kolom tertentu

```
df_active = df.airbnb[df.airbnb['availability_365'] > 0]
df_active.head(10)
```

|   | id   | name   | host_id | host_name     | neighbourhood_group | neighbourhood   | latitude | longitude | room_type       | price | minimum_nights | number_of_reviews | last_review | reviews_per_month | calculated_host_listings_count | availability_365 | year   | month |
|---|------|--|---------|---------------|---------------------|-----------------|----------|-----------|-----------------|-------|----------------|-------------------|-------------|-------------------|--------------------------------|------------------|--------|-------|
| 0 | 2539 | Clean & quiet apt home by the park             | 2787    | John          | Brooklyn            | Kensington      | 40.64749 | -73.97237 | Private room    | 149   | 1              | 9                 | 2018-10-19  | 0.21              | 6                              | 365              | 2018.0 | 10.0  |
| 1 | 2595 | Stylish Midtown Castle                         | 2845    | Jennifer      | Manhattan           | Midtown         | 40.75362 | -73.98377 | Entire home/apt | 225   | 1              | 45                | 2019-05-21  | 0.38              | 2                              | 355              | 2019.0 | 5.0   |
| 2 | 3647 | THE VILLAGE OF HARLEM, NEW YORK!               | 4632    | Elisabeth     | Manhattan           | Harlem          | 40.80902 | -73.94190 | Private room    | 150   | 3              | 0                 | NaT         | NaN               | 1                              | 365              | NaN    | NaN   |
| 3 | 3831 | Cozy Entire Floor of Brownstone                | 4869    | Lisa/Isabelle | Brooklyn            | Clinton Hill    | 40.68514 | -73.95976 | Entire home/apt | 89    | 1              | 270               | 2019-07-05  | 4.64              | 1                              | 194              | 2019.0 | 7.0   |
| 4 | 5099 | Large Cozy 1 BR Apartment in Midtown East      | 7322    | Chris         | Manhattan           | Murray Hill     | 40.74767 | -73.97500 | Entire home/apt | 200   | 3              | 74                | 2019-06-22  | 0.59              | 1                              | 129              | 2019.0 | 6.0   |
| 5 | 5178 | Large Furnished Room Near E'way                | 8967    | Shunichi      | Manhattan           | Hell's Kitchen  | 40.76489 | -73.98493 | Private room    | 79    | 2              | 430               | 2019-06-24  | 3.47              | 1                              | 220              | 2019.0 | 6.0   |
| 6 | 5238 | Cute & Cozy Lower East Side 1 bdrm             | 7549    | Ben           | Manhattan           | Chinatown       | 40.71344 | -73.99037 | Entire home/apt | 150   | 1              | 160               | 2019-06-09  | 1.33              | 4                              | 188              | 2019.0 | 6.0   |
| 7 | 5295 | Beautiful 1br on Upper West Side               | 7702    | Lena          | Manhattan           | Upper West Side | 40.80316 | -73.96545 | Entire home/apt | 135   | 5              | 53                | 2019-06-22  | 0.43              | 1                              | 6                | 2019.0 | 6.0   |
| 8 | 5441 | Central Manhattan/near Broadway                | 7989    | Kate          | Manhattan           | Hell's Kitchen  | 40.76076 | -73.98867 | Private room    | 85    | 2              | 188               | 2019-06-23  | 1.50              | 1                              | 39               | 2019.0 | 6.0   |
| 9 | 5803 | Lovely Room 1, Garden, Best Area, Legal rental | 9744    | Laurie        | Brooklyn            | South Slope     | 40.66629 | -73.98779 | Private room    | 89    | 4              | 167               | 2019-06-24  | 1.34              | 3                              | 314              | 2019.0 | 6.0   |

Membuat DataFrame baru yang berisikan kolom availability yang valuenya diatas 0 (x > 0)

## 9. Menampilkan mean, median, min, max, dan lain-lain

```
df_numerik = df_airstnb[['price', 'minimum_nights', 'number_of_reviews', 'reviews_per_month', 'calculated_host_listings_count', 'availability_365']].describe()
df_numerik.round(0)
```

|       | price   | minimum_nights | number_of_reviews | reviews_per_month | calculated_host_listings_count | availability_365 |
|-------|---------|----------------|-------------------|-------------------|--------------------------------|------------------|
| count | 48895.0 | 48895.0        | 48895.0           | 38843.0           | 48895.0                        | 48895.0          |
| mean  | 153.0   | 7.0            | 23.0              | 1.0               | 7.0                            | 113.0            |
| std   | 240.0   | 21.0           | 45.0              | 2.0               | 33.0                           | 132.0            |
| min   | 0.0     | 1.0            | 0.0               | 0.0               | 1.0                            | 0.0              |
| 25%   | 69.0    | 1.0            | 1.0               | 0.0               | 1.0                            | 0.0              |
| 50%   | 106.0   | 3.0            | 5.0               | 1.0               | 1.0                            | 45.0             |
| 75%   | 175.0   | 5.0            | 24.0              | 2.0               | 2.0                            | 227.0            |
| max   | 10000.0 | 1250.0         | 629.0             | 58.0              | 327.0                          | 365.0            |

Menggunakan fungsi `.describe()` akan memunculkan data lengkap terkait mean, median, std, ... , max dari kolom yang dipilih. Lalu fungsi `.round(0)` yang berfungsi menampilkan data dalam format 1 angka dibelakang koma

## 10. Menampilkan Data Sewa Termahal

DATA DENGAN HARGA TERMALAH

```
df_mahal = df_airstnb.sort_values(by='price', ascending=False).head(10).set_index('name')
df_mahal
```

|  | id       | host_id  | host_name | neighbourhood_group | neighbourhood     | latitude | longitude | room_type       | price | minimum_nights | number_of_reviews | last_review | reviews_per_month | calculated_host_listings_count | availability_365 |
|--|----------|----------|-----------|---------------------|-------------------|----------|-----------|-----------------|-------|----------------|-------------------|-------------|-------------------|--------------------------------|------------------|
| name   |          |          |           |                     |                   |          |           |                 |       |                |                   |             |                   |                                |                  |
| 1-BR Lincoln Center                              | 2343889  | 72390391 | Jelena    | Manhattan           | Upper West Side   | 40.77213 | -73.98665 | Entire home/apt | 10000 | 30             | 0                 | NaN         | NaN               | 1                              | 83               |
| Furnished room in Astoria apartment              | 7003697  | 20562832 | Kathrine  | Queens              | Astoria           | 40.76810 | -73.91651 | Private room    | 10000 | 100            | 2                 | 2016-02-13  | 0.04              | 1                              | 0                |
| Luxury 1 bedroom apt - stunning Manhattan views  | 13894339 | 5143901  | Erin      | Brooklyn            | Greenpoint        | 40.73260 | -73.95739 | Entire home/apt | 10000 | 5              | 5                 | 2017-07-27  | 0.16              | 1                              | 0                |
| Spanish Harlem Apt                               | 4737930  | 1235070  | Olson     | Manhattan           | East Harlem       | 40.79264 | -73.93898 | Entire home/apt | 9999  | 5              | 1                 | 2015-01-02  | 0.02              | 1                              | 0                |
| 2br - The Heart of NYC Manhattan Lower East Side | 31340283 | 4382127  | Matt      | Manhattan           | Lower East Side   | 40.71980 | -73.98566 | Entire home/apt | 9999  | 30             | 0                 | NaN         | NaN               | 1                              | 365              |
| Quiet, Clean, Lit & LES & Chinatown              | 9528820  | 3906464  | Amy       | Manhattan           | Lower East Side   | 40.71335 | -73.98507 | Private room    | 9999  | 99             | 6                 | 2016-01-01  | 0.14              | 1                              | 83               |
| Beautiful/Spacious 1 bed luxury Apt Tribeca/Soho | 23377410 | 18126455 | Ram       | Manhattan           | Tribeca           | 40.72197 | -74.00633 | Entire home/apt | 8500  | 30             | 2                 | 2018-09-18  | 0.18              | 1                              | 251              |
| Film Location                                    | 2953058  | 1177497  | Jessica   | Brooklyn            | Clinton Hill      | 40.69137 | -73.96723 | Entire home/apt | 8000  | 1              | 1                 | 2019-09-15  | 0.03              | 11                             | 365              |
| East 72nd Townhouse by (Hidden by Airbnb)        | 2279726  | 15615878 | Sally     | Manhattan           | Upper East Side   | 40.76824 | -73.95989 | Entire home/apt | 7783  | 1              | 0                 | NaN         | NaN               | 12                             | 146              |
| 70' Luxury Motor/Boat on the Hudson              | 33007610 | 7407743  | Jack      | Manhattan           | Battery Park City | 40.71162 | -74.01693 | Entire home/apt | 7500  | 1              | 0                 | NaN         | NaN               | 1                              | 364              |

Menampilkan data dengan cara `.sort_value()` berdasarkan price dan ascendingnya False

## 11. Menampilkan Data Sewa Termurah

DATA DENGAN HARGA TERMURAH

```
df_murah = df_airstnb.sort_values(by='price', ascending=True).head(10).set_index('name')
df_murah
```

|  | id       | host_id  | host_name | neighbourhood_group | neighbourhood      | latitude | longitude | room_type       | price | minimum_nights | number_of_reviews | last_review | reviews_per_month | calculated_host_listings_count | availability_365 |
|--|----------|----------|-----------|---------------------|--------------------|----------|-----------|-----------------|-------|----------------|-------------------|-------------|-------------------|--------------------------------|------------------|
| name   |          |          |           |                     |                    |          |           |                 |       |                |                   |             |                   |                                |                  |
| Coliving in Brooklyn Modern design / Shared room   | 21291569 | 10197059 | Sergi     | Brooklyn            | Bushwick           | 40.69211 | -73.90670 | Shared room     | 0     | 30             | 2                 | 2019-06-22  | 0.11              | 6                              | 333              |
| Sunny, Quiet Room in Greenpoint                    | 20608117 | 1641537  | Lauren    | Brooklyn            | Greenpoint         | 40.73462 | -73.94072 | Private room    | 0     | 2              | 12                | 2017-10-27  | 0.53              | 2                              | 0                |
| Best Coliving space ever! Shared room.             | 21304320 | 10197059 | Sergi     | Brooklyn            | Bushwick           | 40.69166 | -73.90928 | Shared room     | 0     | 30             | 5                 | 2019-05-24  | 0.26              | 6                              | 139              |
| Hostel Style Room   Ideal Traveling Buddies        | 20333471 | 13169736 | Anisha    | Bronx               | East Morningside   | 40.83296 | -73.88668 | Private room    | 0     | 2              | 55                | 2019-06-24  | 2.56              | 4                              | 127              |
| the best you can find                              | 20933849 | 13709292 | Quachi    | Manhattan           | Murray Hill        | 40.75091 | -73.97597 | Entire home/apt | 0     | 3              | 0                 | NaN         | NaN               | 1                              | 0                |
| Huge Brooklyn Brownstone Living, Close to R.R.     | 18750597 | 8993084  | Kimberly  | Brooklyn            | Bedford-Stuyvesant | 40.69023 | -73.95428 | Private room    | 0     | 4              | 1                 | 2018-01-06  | 0.05              | 4                              | 28               |
| Cozy yet spacious private brownstone bedroom       | 20639914 | 86327101 | Adeyemi   | Brooklyn            | Bedford-Stuyvesant | 40.68258 | -73.91284 | Private room    | 0     | 1              | 95                | 2019-06-23  | 4.35              | 6                              | 222              |
| Spacious comfortable master bedroom with nice view | 20639628 | 86327101 | Adeyemi   | Brooklyn            | Bedford-Stuyvesant | 40.68173 | -73.91342 | Private room    | 0     | 1              | 93                | 2019-06-15  | 4.28              | 6                              | 176              |
| MARTIAL LOFT 3: REDEMPTION (apartments, 2nd room)  | 20523943 | 15787004 | Marjol    | Brooklyn            | Bushwick           | 40.69467 | -73.92433 | Private room    | 0     | 2              | 16                | 2019-05-18  | 0.71              | 5                              | 0                |
| Contemporary bedroom in brownstone with nice view  | 20639782 | 86327101 | Adeyemi   | Brooklyn            | Bedford-Stuyvesant | 40.68279 | -73.91170 | Private room    | 0     | 1              | 95                | 2019-06-21  | 4.37              | 6                              | 232              |

## 12. Menampilkan Data Persebaran di Tiap Kota

DATA DENGAN PERSEBARAN KOTA TERBANYAK

```
list_kota = df_airbnb['neighbourhood_group'].value_counts().reset_index()
list_kota.columns = ['name', 'total']
df_total = pd.DataFrame(list_kota)
df_total.head(10).set_index('name')
```

17] ✓ 0.0s

| name          | total |
|---------------|-------|
| Manhattan     | 21661 |
| Brooklyn      | 20104 |
| Queens        | 5666  |
| Bronx         | 1091  |
| Staten Island | 373   |

Menampilkan data dengan cara mengambil data dari kolom 'neighbourhood\_group' yang dihitung banyaknya menggunakan .value\_counts()

## 13. Menampilkan Data Ketersediaan Terbanyak

DATA DENGAN KETERSEDIAAN TERBANYAK

```
df_sedia = df_airbnb.sort_values(by='availability_365', ascending=False).head(10).set_index('name')
df_sedia
```

18] ✓ 0.0s

| name  | id       | host_id   | host_name | neighbourhood_group | neighbourhood      | latitude | longitude | room_type       | price | minimum_nights | number_of_reviews | last_review | reviews_per_month | calculated_host_listings_count | availability_365 |
|---|----------|-----------|-----------|---------------------|--------------------|----------|-----------|-----------------|-------|----------------|-------------------|-------------|-------------------|--------------------------------|------------------|
| Heaven for you only for 99\$                    | 36473253 | 261338177 | Diana     | Brooklyn            | Gravesend          | 40.59118 | -73.97119 | Shared room     | 25    | 7              | 0                 | NaN         | NaN               | 6                              | 365              |
| Penthouse Flat, Million-\$ View, Best Area!     | 4339924  | 22530714  | Murad     | Brooklyn            | Bushwick           | 40.68890 | -73.92904 | Entire home/apt | 200   | 90             | 91                | 2016-10-04  | 1.59              | 1                              | 365              |
| Spacious 4 people room in nice surrounding      | 31845412 | 27974952  | Alex      | Brooklyn            | East Flatbush      | 40.64434 | -73.95040 | Shared room     | 31    | 30             | 0                 | NaN         | NaN               | 7                              | 365              |
| Vibrant Private Bedroom in LWS 107              | 31877856 | 238321374 | Eyal      | Manhattan           | Upper West Side    | 40.80008 | -73.95926 | Private room    | 60    | 30             | 1                 | 2019-06-16  | 1.00              | 32                             | 365              |
| West Village Studio on quiet cobblestone street | 36453952 | 115491896 | Will      | Manhattan           | West Village       | 40.73620 | -74.00827 | Entire home/apt | 205   | 1              | 0                 | NaN         | NaN               | 1                              | 365              |
| CENTRAL PARK / COLUMBUS CIRCLE / 1BR            | 12672036 | 1473013   | Mike      | Manhattan           | Hell's Kitchen     | 40.76747 | -73.98613 | Entire home/apt | 87    | 30             | 2                 | 2018-05-30  | 0.06              | 32                             | 365              |
| Spacious 3 Bedroom in Park Slope                | 12648471 | 52577563  | Rosa      | Brooklyn            | Sunset Park        | 40.66455 | -73.96025 | Entire home/apt | 135   | 4              | 9                 | 2017-10-07  | 0.23              | 3                              | 365              |
| Chic and cozy                                   | 31839917 | 26317294  | Denise    | Manhattan           | Upper West Side    | 40.77796 | -73.98213 | Private room    | 95    | 275            | 0                 | NaN         | NaN               | 1                              | 365              |
| Crown heights apt                               | 31815470 | 44801404  | Idris     | Brooklyn            | Crown Heights      | 40.66897 | -73.92848 | Private room    | 130   | 14             | 0                 | NaN         | NaN               | 1                              | 365              |
| Sleeps 6 by Metro/Subway - 15 min to Manhattan  | 4366049  | 20243795  | Tony      | Brooklyn            | Bedford-Stuyvesant | 40.68204 | -73.95642 | Entire home/apt | 180   | 3              | 50                | 2018-10-28  | 0.97              | 3                              | 365              |

Menampilkan dengan cara yang sama seperti harga, tetapi untuk pengaturan sortingnya berdasarkan availability

## 14. Menampilkan Data Minimal Malam Terbanyak

DATA DENGAN MINIMAL MALAM UNTUK SEWA TEMPAT TERTINGGI

```
df_malam = df_airbnb.sort_values(by='minimum_nights', ascending=False).head(10).set_index('name')
df_malam
```

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Python

|                                     | id       | host_id   | host_name | neighbourhood_group | neighbourhood     | latitude          | longitude | room_type       | price           | minimum_nights | number_of_reviews | last_review | reviews_per_month | calculated_host_listings_count | availability_365 | year   | month |
|-------------------------------------|----------|-----------|-----------|---------------------|-------------------|-------------------|-----------|-----------------|-----------------|----------------|-------------------|-------------|-------------------|--------------------------------|------------------|--------|-------|
| Prime W. Village location 1 bdrms   | 4254302  | 17550546  | Genevieve | Manhattan           | Greenwich Village | 40.73293          | -73.99782 | Entire home/apt | 180             | 1250           | 2                 | 2014-11-09  | 0.03              | 1                              | 365              | 2014.0 | 11.0  |
|                                     | NaN      | 16151504  | 6607676   | Peter               | Manhattan         | Battery Park City | 40.71229  | -74.01620       | Entire home/apt | 400            | 1000              | 0           | NaN               | 1                              | 362              | NaN    | NaN   |
| Historic Designer 2 Bed. Apartment  | 10053983 | 2687686   | Glenn H.  | Manhattan           | Harlem            | 40.82915          | -73.94034 | Entire home/apt | 99              | 999            | 2                 | 2018-01-04  | 0.07              | 1                              | 42               | 2018.0 | 1.0   |
| Beautiful place in Brooklyn #2      | 20960053 | 151084261 | Ariane    | Brooklyn            | Williamsburg      | 40.71772          | -73.95059 | Private room    | 79              | 999            | 24                | 2018-06-28  | 1.12              | 6                              | 249              | 2018.0 | 6.0   |
| Shored House (Bedrooms 4x4)         | 30378211 | 200401254 | Meg       | Manhattan           | Greenwich Village | 40.73094          | -73.99900 | Shared room     | 180             | 999            | 0                 | NaN         | NaN               | 1                              | 365              | NaN    | NaN   |
| Beautiful Fully Furnished 1 bdr/bth | 5431845  | 3680008   | Alisa     | Queens              | Long Island City  | 40.75104          | -73.93363 | Entire home/apt | 134             | 500            | 30                | 2018-06-24  | 0.57              | 1                              | 90               | 2018.0 | 6.0   |
| Peculiar apartment close to FJD     | 11096888 | 2228137   | Amanda    | Brooklyn            | Kensington        | 40.64779          | -73.97956 | Private room    | 45              | 500            | 0                 | NaN         | NaN               | 1                              | 358              | NaN    | NaN   |
| Zen Room in Crown Heights Brooklyn  | 8968115  | 8996136   | Laura     | Brooklyn            | Crown Heights     | 40.67255          | -73.94914 | Private room    | 50              | 500            | 10                | 2018-09-22  | 0.22              | 1                              | 365              | 2018.0 | 9.0   |
| Wonderful Large 1 bedroom           | 6188897  | 10720284  | John      | Manhattan           | Harlem            | 40.82135          | -73.95521 | Entire home/apt | 75              | 500            | 0                 | NaN         | NaN               | 1                              | 362              | NaN    | NaN   |
| Williamsburg Apartment              | 33834935 | 62674375  | Meg       | Brooklyn            | Williamsburg      | 40.70898          | -73.94885 | Entire home/apt | 140             | 500            | 0                 | NaN         | NaN               | 1                              | 331              | NaN    | NaN   |

Menampilkan data dengan cara sort value berdasarkan 'minimum\_nights'

## 15. Visualisasi Data Berdasarkan Lokasi dan Harga (sebagai warna titik) menggunakan Diagram Scatter dari Matplotlib



Menampilkan dengan menggunakan plt.scatter() dan untuk titik x = longitude dan y = latitude, lalu untuk jenis dan warna dari titik tersebut berdasarkan price dari tiap Lokasi (semakin mahal semakin terang)



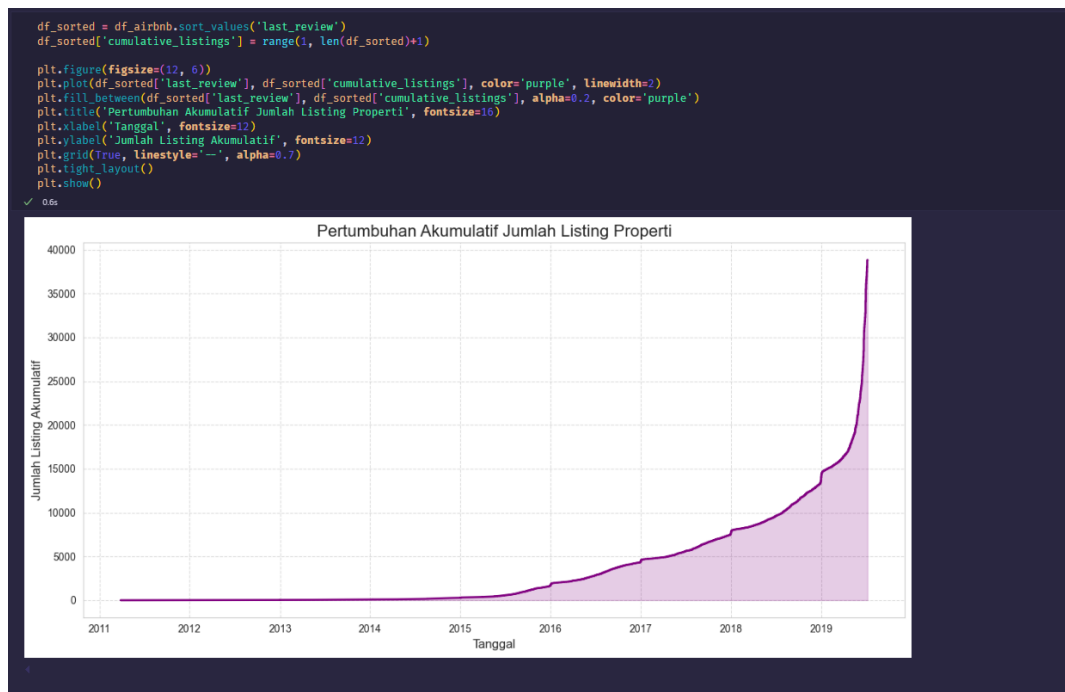
## 16. Visualisasi Data Berdasarkan Jumlah Review Tiap Bulan (Dengan menggabungkan Data dari tahun 2011-2019) menggunakan Seaborn Heatmap



Menampilkan visualisasi data dengan menggunakan seaborn heatmap.

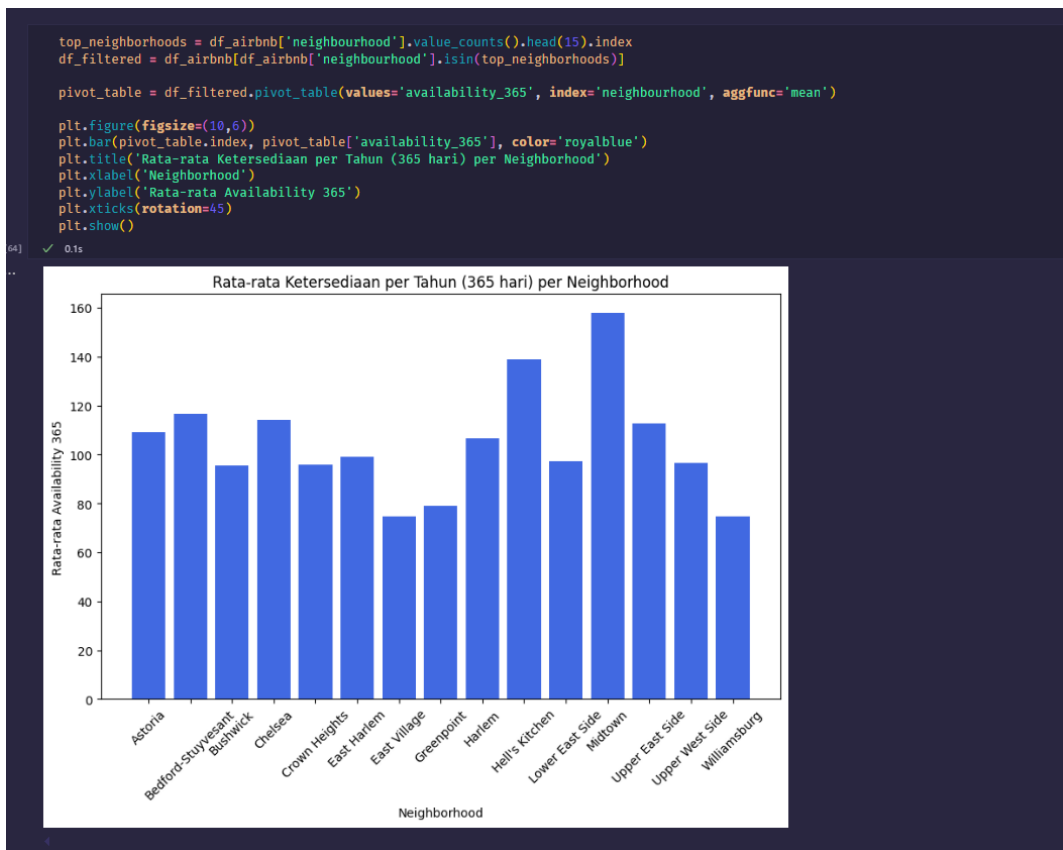
Pertama-tama membuat DataFrame baru yang disusun (groupby) berdasarkan bulan pada 'last\_review' yang ditotalkan dengan .sum() supaya mengetahui seberapa banyak review terjadi. Kemudian data tersebut disorting melalui index agar urut sesuai bulan. Setelah diurutkan, data tersebut diberikan index dari 1-13, lalu dimasukkan ke fungsi heatmap dan membuat data sumbu X menjadi nama bulan dengan plt.xticks()

## 17. Visualisasi Data Berdasarkan Pertumbuhan Listing Tiap Tahun menggunakan Matplotlib Plot



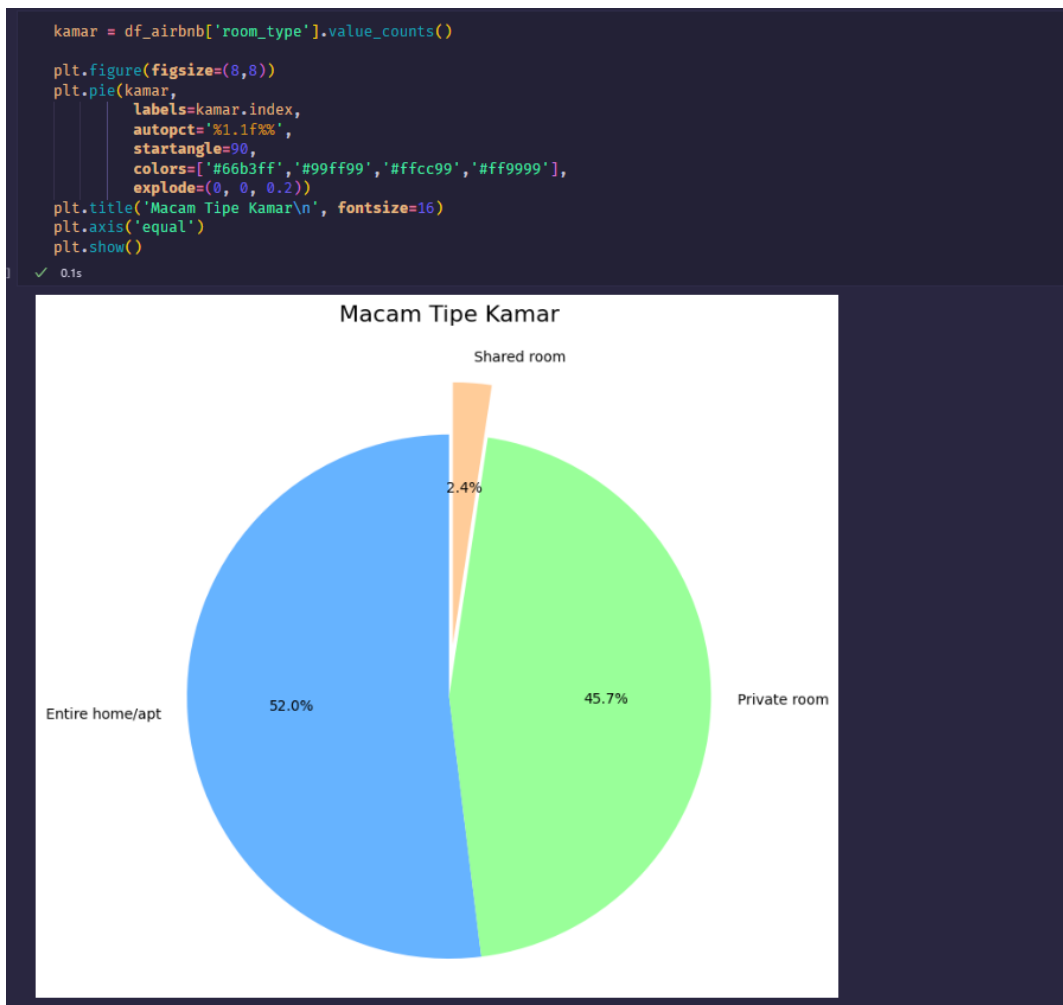
Menampilkan data dengan cara membuat variabel berisikan data sort value dari last review. Lalu dari data tersebut divisualisasikan dengan `plt.plot()` sehingga menghasilkan output seperti diatas

## 18. Visualisasi Data Berdasarkan Ketersediaan Tiap Neighbourhood menggunakan Matplotlib Bar



Menampilkan data dengan cara membuat variabel berisikan index dari neighbourhood dengan membatasi top 15 teratas. Setelah itu membuat variabel yang berisikan filter data untuk top 15 data teratas di neighbourhood. Kemudian membuat pivot table yang berisikan mean dari value availability dan memasukkan data pivot tersebut kedalam plt.bar()

### 19. Visualisasi Data Berdasarkan Persentasi Macam Tipe Kamar menggunakan Matplotlib Pie



Menampilkan data dengan cara membuat variabel baru berisikan total value dari macam jenis kamar, lalu data tersebut diolah menggunakan `plt.pie()`

## 20. Visualisasi Data Berdasarkan Distribusi Tipe Kamar Tiap Kota Menggunakan Matplotlib Plot Stack



Menampilkan data dengan cara membuat pivot table yang berisikan kolom tipe kamar dengan index kota. Lalu data tersebut diolah menggunakan `plt.plot()` dan mengaktifkan fitur stacked agar data pada kota yang sama ditumpuk menjadi satu