



Data Base and Data Mining Group of Politecnico di Torino

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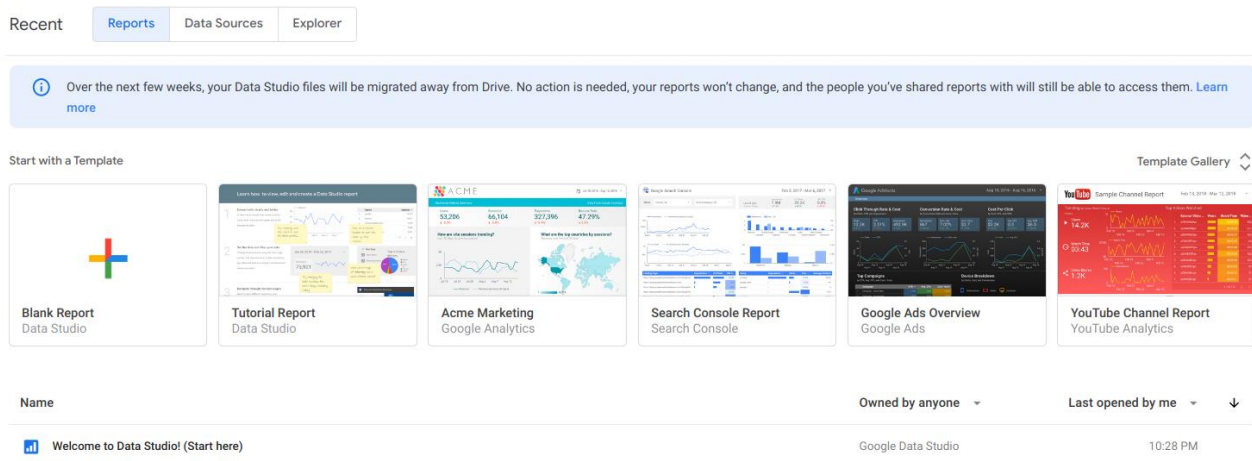
# Data Science and Database Technology

## Practice 2 – Data Studio

### 1. Login

Connect to [Google Data Studio](#), login with your Google Account or [create a new free Google Account](#).

- <https://datastudio.google.com>



### 2. Welcome report

Click on “[Tutorial Report](#)” and follow the tutorial.

- <https://datastudio.google.com/reporting/0B5FF6JBKbNJxOWItcWo2SVVVeGc>
- learn the basics of the Data Studio tool by copying the “Welcome report” and following the step-by-step instructions provided.
- page 8, “Track report usage with Google Analytics”, can be safely skipped.



## Welcome to Data Studio! (Start here)

### 3. Template report

#### Preliminary steps to clone a template report

Start from a provided template report to create new data visualizations.

- Return to the [Data Studio](#) home page
- Click on “Template gallery” to open the template gallery

Template Gallery 

- Choose the “[World Population Data](#)” template



- Click on the “Use Template” button to confirm the selection, then accept the Terms and Conditions if you haven’t yet.

1

2

3

×

Welcome

Terms


Preferences


## Welcome to Google Data Studio


Turn your data into informative dashboards and reports that are easy to read, easy to share, and fully customizable. Data Studio allows you to tell great data stories to support better business decisions.

[GET STARTED](#)

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**Connect**  
 Easily connect to all your data source. Connect to multiple Data Sources within one report.


**Visualize**  
 Select a variety of visualizations. Custom layout and themes. Apply dimensions and metrics. Create custom metrics.


**Share**  
 Easy sharing. Individuals, groups of users, public. Realtime collaboration.

- Click on the “Create Report” button to confirm the data source selection “[Sample] World Population Data 2005 - 2014”

### Create new report

Select a data source(s) to be added to the new report.

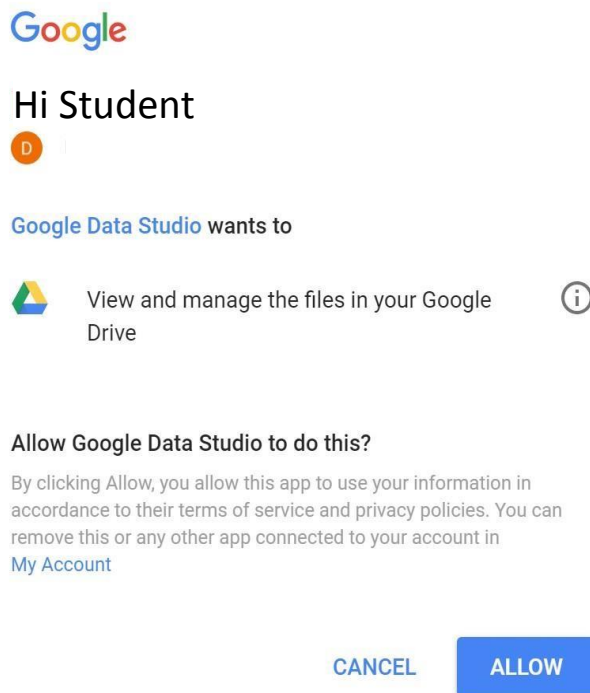
Original Data Source		New Data Source
 [Sample] World Population Data 2005 - 2014	→	 [Sample] World Population Data 2005 - 2014 ▼

Note that **report editors** can create charts using the new data sources and can add dimensions and metrics not currently included in the report.

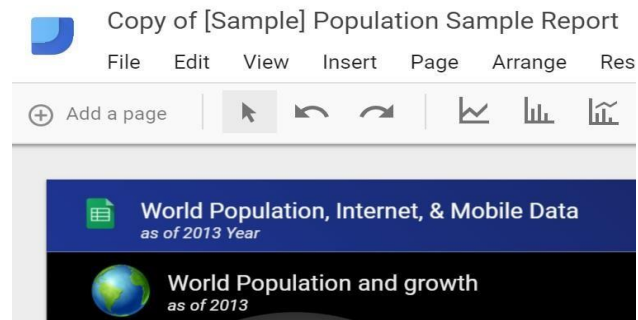
CANCEL

[CREATE REPORT](#)

- If prompted, allow Google Drive access to Data Studio



You have just created a new private report, based on the [“World Population Data” template](#) .



### Analyse the World Population data source

- Click on the “Add a page” button
- Add the following analyses to the new page of the report
- **(Query A)** – Add a **table** in the report to select the following data: Considering only year 2013, select the top-10 countries with the highest “internet %”, their “population” and “internet users”.

	Country	Population	Internet Users	Internet % ▾
1.	Iceland	323,764	312,583.78	96.55%
2.	Bermuda	65,001	61,945.95	95.3%
3.	Norway	5,079,623	4,828,354.37	95.05%
4.	Sweden	9,600,379	9,099,584.83	94.78%
5.	Denmark	5,614,932	5,313,393.31	94.63%
6.	Andorra	79,218	74,464.92	94%
7.	Netherlands	16,804,432	15,788,839.35	93.96%
8.	Liechtenstein	36,925	34,635.65	93.8%
9.	Luxembourg	543,360	509,543.99	93.78%
10.	Finland	5,438,972	4,977,442.59	91.51%

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- **(Query B)** – Add a **pivot table** in the report to select the following data: Considering all years, for each country and for each year, select the total amount of internet users.  
Sort the years in ascending order.  
Sort the countries in descending order of internet users.

Year / Internet Users										
Country	2005	2006	2007	2008	2009	2010	2011	2012	2013	Grand total
China	111,119,406.2	137,960,635.5	210,861,600	299,372,030	384,734,140	458,832,815	514,801,790	571,345,571.9	621,680,040	3,310,708,02...
United States	200,856,878.4	205,676,833.8	225,923,405.3	225,029,534.8	217,807,785.6	221,770,905.2	217,361,813.1	249,090,877.9	266,490,921.1	2,030,008,95...
Japan	85,507,053.79	87,816,865.52	95,104,743	96,559,502	99,876,660	100,163,547	101,044,815.3	110,021,784.3	109,829,560.6	885,924,531....
India	26,917,033.28	32,074,981.17	45,784,262.38	51,450,210.23	60,935,069.13	90,421,848.6	122,970,441.3	155,575,944.2	189,073,079	775,202,869....
Brazil	39,132,246.91	53,013,202.53	58,671,066.19	64,874,291.32	75,887,139.61	79,352,927.6	89,979,662.72	96,467,362.83	103,386,753.3	660,764,653....
Germany	56,664,739.86	59,442,847.04	61,831,405.2	64,045,875.66	64,702,822.53	67,057,082.6	66,476,968.47	66,230,664.01	67,711,179	574,163,584....
Russia	21,853,096.48	25,782,213.34	35,215,734.7	38,297,772.51	41,407,749.18	61,425,263.07	70,050,825.32	91,362,669.29	88,113,243.35	473,508,567....
United Kingdo...	42,280,844.2	41,874,781.52	46,047,037.47	48,450,503.38	52,038,051.21	53,351,410.25	54,010,463.27	55,725,021.44	57,596,158.63	451,374,271....
France	27,083,656.66	29,817,744.88	42,305,908.83	45,497,492.77	46,314,350.85	50,249,884.14	50,846,146.89	53,453,210.78	54,001,779.56	399,570,175....
Korea, Rep.	35,381,486.6	37,778,489.83	38,294,949.78	39,648,445.38	40,132,543.01	41,356,476.34	41,694,820.96	42,040,346.94	42,571,213.41	358,898,772....
Mexico	19,056,947.25	21,885,178.67	23,625,555.33	24,959,561.27	30,665,752.88	36,603,728.44	44,374,084.59	48,036,872.11	53,165,660.61	302,373,341....
Nigeria	4,954,120.63	7,946,863.42	9,964,583.8	23,981,601.49	31,076,204	38,329,867.2	46,680,048.58	55,377,478.53	65,973,831.1	284,284,598....
Italy	20,289,319.4	22,088,897.62	23,836,986.65	26,195,543.31	28,856,266.73	31,820,117.45	32,296,481.3	33,241,022.81	35,212,344.36	253,836,979....

To view the resulting report, click on the **“view”** button in the upper right corner.

### 3. New report on Airbnb Boston reviews

To create a new report from scratch, a data source must be identified. To this aim, a portion of the [Kaggle dataset of the Airbnb reviews in Boston](#) has been uploaded into a [shared Google Sheets](#) to be used as data source for Google Data Studio.

- the Google Sheets, with approximately 10k reviews to be used as data source, is available at <https://docs.google.com/spreadsheets/d/1a2c9vCMFFfDXmhjoEoX2EwS2lYtbqE4WfZY72TXW9co/edit#gid=285360760>

AirBnB reviews in Boston by Kaggle

File Edit View Insert Format Data Tools Add-ons Help All changes saved in Drive

100% \$ % .0 .00 123 Calibri 11 B I S A

listing\_id

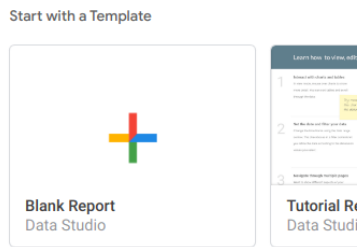
	A	B	C	D	E	F	G
1	listing_id	id	Date	reviewer_id	reviewer_name	comments	host_id
2	9857	92488772	08-Aug-16	56470796	Danielle	Seamless was easy to work with and very responsive. The apt was clean, spacious, and in walking distance to dining, shopping, and nightlife. We would stay here again.	25188
3	9857	90834004	02-Aug-16	86373945	Courtney	Seamless was really great about communication with my family. The location is absolutely perfect and close to everything! It's a little noisy from the road, and the air conditioner kept fluctuating. The bathroom shower curtain looked like maybe mold was growing on it. But other than that it was a good place to stay in!	25188
4	9857	81205609	21-Jun-16	74520248	Patrick	We had a fantastic stay in Boston. Apartment presented exactly like the photos and the location is just perfect for exploring Boston. It was straight forward to check in and I would not hesitate to stay again if I was to return to Boston.	25188
5	9857	52407219	29-Oct-15	42949625	Heather	Excellent location, good sized two bedroom apartment, kitchen had everything you need. Overall would definitely stay here again!	25188
6	9857	51958656	25-Oct-15	45617313	John	The apartment was even better than the pictures, very comfortable and nice, check-in was very easy and the apartment was clean and had plenty of amenities (bathroom supplies, towels, soap). would recommend this location and apartment to anyone who is looking for a place to stay in Boston.	25188
7	9857	46422364	10-Sep-15	2642405	Mike	Awesome place, nicer than the pictures, super clean and the AC was on when we got it (was 90 outside!)	25188
8	9857	37160926	05-Jul-15	11002414	Stephanie	The name seamless says it all. The whole process couldn't have been easier or more pleasant. The apartment was in an amazing location and was clean and very comfortable to stay in. There are two wall units for AC which was completely sufficient to cool the entire apartment. We were extremely happy with our experience and will definitely consider staying there again during our next trip to Boston.	25188
9	9857	33570553	20-May-15	45000384	Katrina	Everything worked perfect, from checkin to checkout. The apartment was clean and comfortable and had	25188

Reviews Query DW Listings Sheet1

- Spend some time to understand the data by reading their description on Kaggle and looking at the table on Google Sheets.
- The data source table has been created by joining the “Listings” and “Reviews” original tables provided by Kaggle, and exporting the first 10k joined rows sorted by ascending “listing\_id”.

### Create a new report

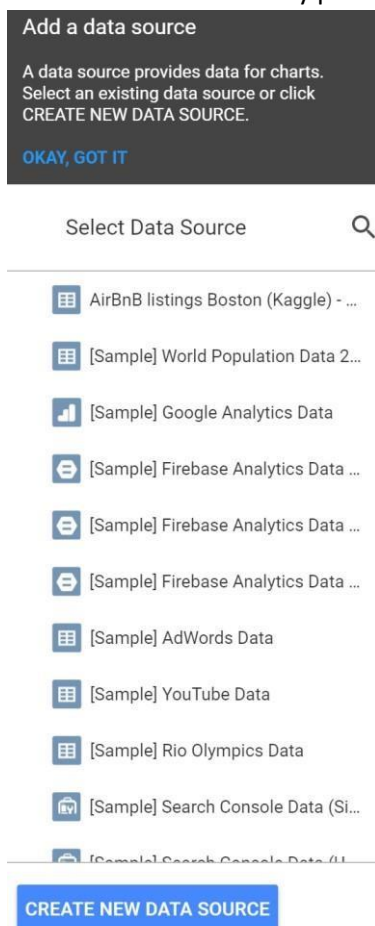
- Go to the Data Studio home page.
- Click on “Start a new report” (Blank).



- Rename the “Untitled Report” with a name of your choice by clicking on the name itself.

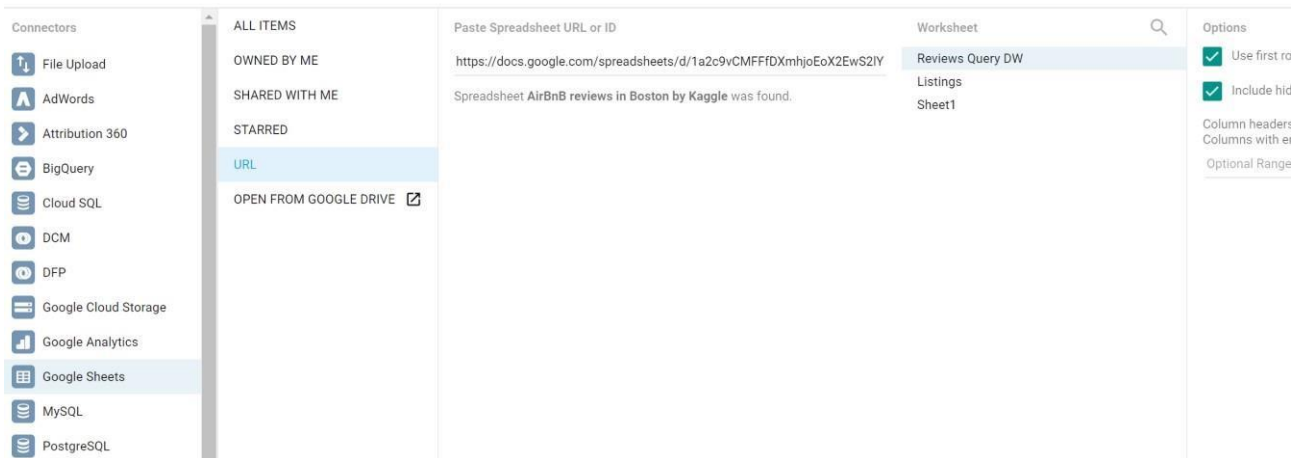


- Create a new data source by clicking on the blue button on the bottom right or select the Airbnb data source if it is already present in the right-pane list.

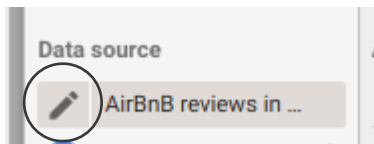


Connect to the Google Sheet data source by using its URL:

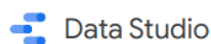
- Choose the “Google Sheets” connector from the list of possible connectors
- Choose the “URL” option in the first column
- Paste the Airbnb-data Google Sheet URL in the specific field:  
<https://docs.google.com/spreadsheets/d/1a2c9vCMFFfDXmhjoEoX2EwS2IYTbqE4WfZY72TXW9co/edit#gid=285360760>
- Choose the “Reviews Query DW” worksheet in the next column
- Tick the option to “use the first row as headers” if it is not ticked yet
- Click on the “Connect” button to execute the connection to the data source



You can edit the data source with:



or with



Search Data Studio

Create

Recent

Reports

Data sources

Explorer

in the Google Data Studio home page.

## Data sources

Data sources have two types of fields: dimensions and metrics.

- A **dimension** is a category of data.
- A **metric** is a number that quantifies something in that category.
- A Data Studio report lets you visualize those dimensions and metrics in charts and tables.
- In your Data Studio data sources and report properties panels, dimensions appear as **green** chips, while metrics appear as **blue** chips.

Field	ID
Browser	t0._ga:browser_
Sessions	t0._ga:sessions_

## Dimensions, metrics, and transformations





- Check the **type** and **aggregation** of each field and that all the fields are correctly interpreted as either **dimension** or **metric**.
- **Create new useful fields (dimensions or metrics)** from the existing ones by exploiting formulas, such as in the following (click on the “+” and “fx” placeholders). For details on this step, see:

<https://support.google.com/datastudio/answer/6299685?hl=en>



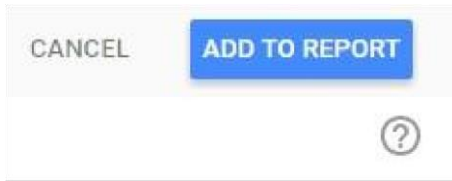
## + ADD A FIELD

- **LENGTH**(comments) → to count the number of chars of the comment field
- **CONCAT**(latitude, CONCAT(',', longitude)) → to generate a (lat, long) field useful for map charts;
- **price / square\_feet** → to compute the average price per square feet (try to create a field that contains the square meters instead of the square feet (1 foot = 0.3048 meter)).
- **MONTH**(Date) → to extract the month of the year from the full date, e.g. 12
- **YEAR**(Date) → to extract the year from the full date, e.g. 2017
- **CONCAT**(YEAR(Date), MONTH(Date)) → to build a field which is the full month, e.g. 201712
  - if you already have the computed fields “month” and “year”, you can also use them in the formula, e.g., CONCAT(year, month)

Date	:		Date (YYYYMMDD)	▼	None	
host_acceptance_rate	:	123	Number	▼	None	▼
host_id	:	ABC	Text	▼	None	
host_is_superhost	:	ABC	Text	▼	None	
host_location	:	ABC	Text	▼	None	
host_response_rate	:	123	Number	▼	None	▼
host_response_time	:	ABC	Text	▼	None	
host_since	:		Date (YYYYMMDD)	▼	None	
id	:	123	Number	▼	None	▼
latitude	:	123	Number	▼	None	▼
latlong	fx :		Latitude, Longitude	▼	None	
listing_id	:	123	Number	▼	None	▼
longitude	:	123	Number	▼	None	▼
month	fx :		Month (MM)	▼	None	
price	:	123	Number	▼	None	▼
property_type	:	ABC	Text	▼	None	



After creating new fields and updating the existing ones, click on “Add to report”

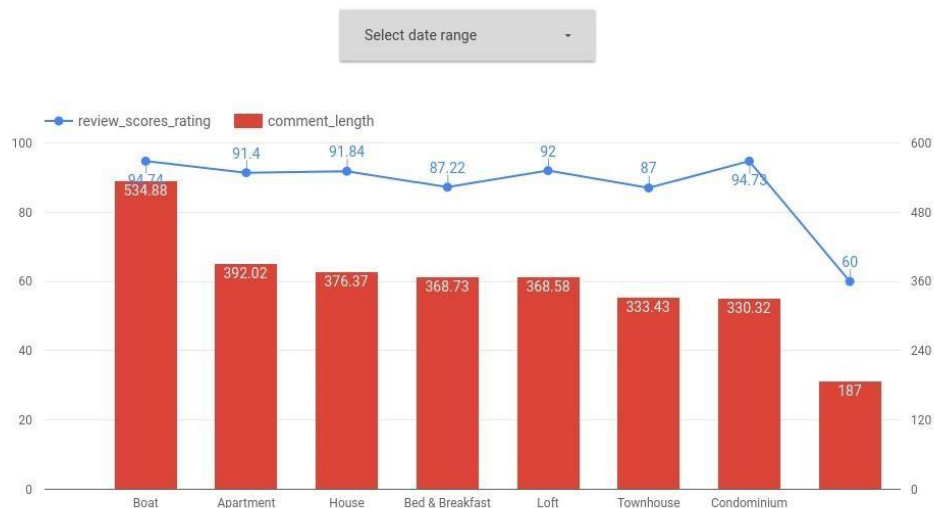


## Analyse the data

Analyse the data by building the following visualizations. Then, explore and create new visualizations to find interesting insights on your own.

- **Analysis (1):** compare the trend of the average length of the review “comments” (number of chars) vs the average “review\_scores\_rating” for different “proptert\_type”. Sort the data by descending average length of comments. Allow end-users to filter the data under analysis by selecting a date range of their choice.

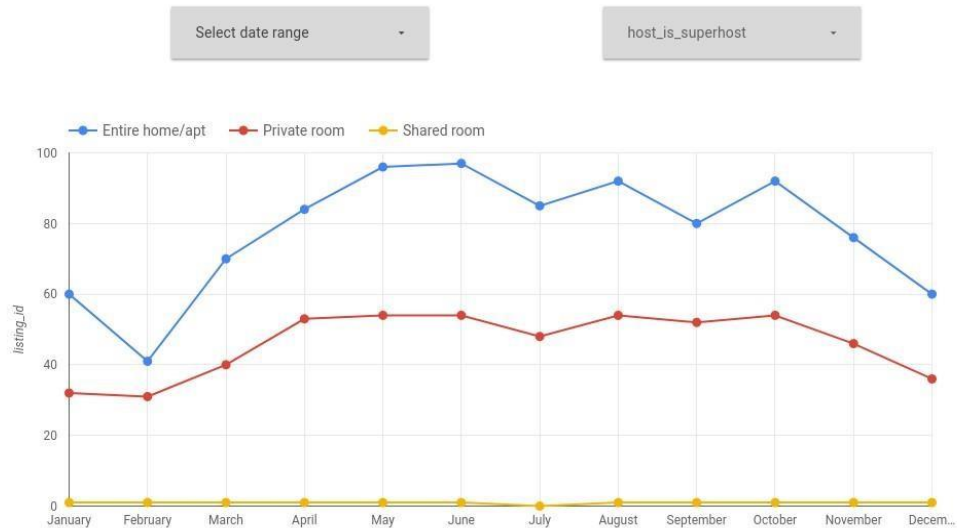
**Review score ratings vs length of review comments**  
by property type



- **Analysis (2):** compare the trend of the number of different “listing\_id” reviewed, for each “room\_type”, and for each month of the year. Allow end-users to filter the data under analysis by selecting a date range and the type of superhost (true/false).

### Number of different listing\_ids reviewed

for each “room\_type” and for each month of the year



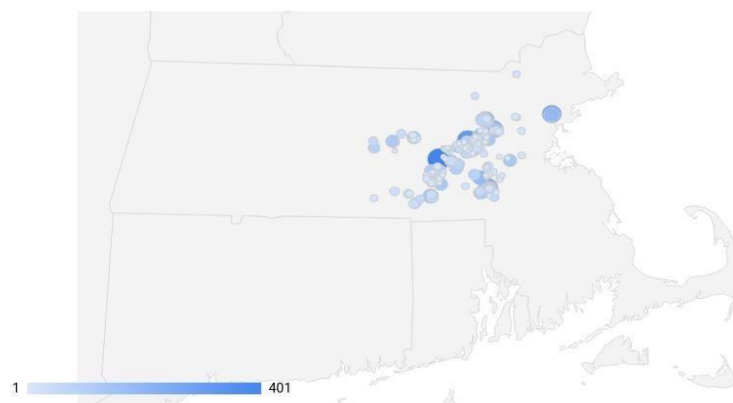
Explore, create and present new additional analyses to identify interesting insights. For instance:

- **Analysis (3):** analyse the number of different reviewers for each location (lat, long).

Note that the Kaggle dataset of the Airbnb reviews is in Boston, **Massachusetts**, US

### Number of different reviewers

for each (lat, long)



- **Analysis (4):** Visualize, for each property type and for each year, the average rating score values sorted by ascending property type and by descending mean rating\_score\_value. Exclude possible null values for the attribute property\_type.

Average review score values for each property type and year			
	property_type ① ▲	year	review_scores_value ② ▼
1.	Apartment	2009	9.38
2.	Apartment	2010	9.04
3.	Apartment	2016	9.03
4.	Apartment	2014	9
5.	Apartment	2013	8.99
6.	Apartment	2015	8.97
7.	Apartment	2011	8.94
8.	Apartment	2012	8.92
9.	Bed & Breakfast	2014	8.94
10.	Bed & Breakfast	2013	8.93

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- **Analysis (5):** Visualize, for each year and for each room type, the total count of top-scored reviews (review\_score\_value = 10).

Compare the obtained results with the count of the distinct listing\_id reviewed.

