

The Battle of Cities: Tbilisi vs Berlin

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Table of contents

1. [Introduction](#)
2. [Data](#)
3. [Nightlife Data Analysis](#)
4. [Hotels Data Analysis](#)
5. [Maps](#)
6. [Other Statistics](#)
7. [Discussion](#)

1. Introduction

1.1 Background

Tbilisi, the capital of post-soviet country Georgia, one of the oldest cities which was rediscovered by the world in recent years. For the past 10 years, the whole country is experiencing immense growth in tourism and its especially noticeable in Tbilisi. People come here to experience the natural beauty of Caucasus mountains or, the greenness of the forests and the wildlife preserved there, or simply enjoy summer on the beaches of the Adjara region. However, Tbilisi became popular for its night clubs, bars, and restaurants. As time goes by Tbilisi is attaining its reputation for mesmerizing nightlife and raving culture. In several articles Forbes, The Guardian and VICE pronounced Tbilisi as the center of the nightlife, putting him in from of such huge cities like Berlin and London. Last year Forbes called Tbilisi "This Year's Most Exciting City" [1] and it's only beginning.

On the other side of the story, we have Berlin, which has a well-established reputation and has worldwide popularity due to its outstanding night clubs and bars and the experience the city can give to the peoples who are into nightlife. Since the fall of the berlin wall, this city converted itself as the benchmark city for clubbing and nightlife. However, the growth of Tbilisi's, later conversations and the increase in demand for the Georgian DJ's around the globe brought me to a question, is Tbilisi in competition with Berlin for the best nightlife city? Does Tbilisi compare to Berlin in terms of night clubs and bars, and if it's worth it tapping into that business?

1.2 Approach

To elaborate better on this topic, we need to dive into the culture and investigate important metrics which I will address in the next paragraph. To experience nightlife fully, especially in the foreign city, just having a good night club is not enough, it's a combination of other venues, services and freedom of expression. The Guardian in their article about Tbilisi said that "These cities share the magic ingredients that allowed clubbing to thrive in east Berlin: cheap rents, plenty of space, often in the form of unused communist-era buildings, and creative, open-minded young people"[2]. We'll look at the combination of factors like taxi services, hotels, a measure of personal freedom and crime rates in combination with the number of clubs and bars and their average reviews and how easy it is to travel to Tbilisi.

1.3 Methodology

We will be looking at multiple indicators and the distribution of indicators side by side for two cities; Tbilisi and Berlin. Based on the visual and empirical analysis we will try to draw a picture of how respectable venues in those cities are and find similarities and dissimilarities. We will use density distribution and histogram to visualize how ratings and number of reviews are distributed. We will look at the clustered map to analyze how convenient hotels and venues are located for the visitors. And finally, we will compare trends in tourism, taxi fares and crime rates to evaluate how attractive those cities can be for people looking for an amazing nightlife experience.

2. Data:

2.1 Main Data Collection

I used foursquare API to collect the top 25 venues from Tbilisi, Georgia, and Berlin, Germany searchable under the category "Night Life" and "Night Clubs." Using the same portal and the same technics I collected the top 25 venues searchable under the category "Hotel." Process of the initial data extraction using python notebook can be found [here](#)

2.2 Complementary Data

After initial scraping and cleaning the data for top 25 hotels and nightlife venues, I extracted average ratings of the venues with the total number of feedbacks for each venue to analyze the reputation and the impressions and of the visitors. Data is merged with additional columns for 'categories', 'longitude' and 'latitude' which was used for clustering and mapping.

- Rating was chosen as a measure of quality - how well does it satisfy customers and how well does it match expectations.
- Overall number of reviews was choosing as a measure of how many people have been visiting place and how reputable venue of choice has been compared to other places

2.3 Other Indices

To portray full picture, I obtained information about foreign tourists visiting Tbilisi and Berlin for last four years. Direct data for Tbilisi visitors is not available to I have to obtain data for last 4 years, I extracted total number of international visitors in Georgia from Wikipedia page [3] and calculated Tbilisi's share based on GNTA database information. GNTA showed that registered 27.1% of the accommodation units in Tbilisi, thus I used 27% of the total number of visitors as to analyze tourists in Tbilisi.

For Berlin it was relatively easy to accomplish as the explicit data is available with number of foreign visitors who stayed in Berlin for past four years on statista.com webpage [4]

2.4 Taxi Fares

I used numebo.com to extract and compare taxi fares in Tbilisi[5] and Berlin[6]. Data was extracted in current \$US and was pasted in csv file while I cleaned and reorganized in a manner that was plottable on the bar chart for the comparisons how taxi prices different for the start, 1 km and 1 hour wait. Data contains average, minimum, and maximum values.

2.5 Crime/Safety Index

For the representation of the crime and safety I also used numbeo.com [7] for its crime/safety index. Several indices were used for this part. Three indices represent the measure of the safety. ranging from 0 to 100 and higher the score safer that area is. The crime indices are also measured from 0 to 100 but lower the score better the situation is in that area. The full details about crime and its indices is present in crime/safety comparison section

3. Nightlife Data Analysis

3.1 First we import the data for Tbilisi clubs which consists of 25 samples:

	city	name	categories	rating	total	lat	lng
0	Tbilisi	Bassiani	Nightclub	8.9	174	41.722853	44.791265
1	Tbilisi	Cocktail Factory	Cocktail Bar	8.9	22	41.708046	44.779971
2	Tbilisi	Bauhaus	Bar	8.4	45	41.701192	44.803416
3	Tbilisi	8000 Vintages	Wine Bar	9.0	19	41.708375	44.758914
4	Tbilisi	Dadi Wine Bar and Shop	Wine Bar	8.9	137	41.692802	44.801873

We take a look at the top 5 rated venues:

	city	name	categories	rating	total	lat	lng
3	Tbilisi	8000 Vintages	Wine Bar	9.0	19	41.708375	44.758914
5	Tbilisi	41° Cocktail Bar	Cocktail Bar	9.0	20	41.690538	44.800432
0	Tbilisi	Bassiani	Nightclub	8.9	174	41.722853	44.791265
1	Tbilisi	Cocktail Factory	Cocktail Bar	8.9	22	41.708046	44.779971
4	Tbilisi	Dadi Wine Bar and Shop	Wine Bar	8.9	137	41.692802	44.801873

We take a look at the top 5 venues with total number of reviews:

	city	name	categories	rating	total	lat	lng
22	Tbilisi	Cafe Gallery	Nightclub	7.8	459	41.701944	44.791695
18	Tbilisi	Funicular Bar	Cocktail Bar	8.1	244	41.695364	44.786632
17	Tbilisi	Warszawa	Bar	8.1	243	41.695068	44.801587
6	Tbilisi	Mtkvarze	Nightclub	8.4	200	41.722439	44.783404

	city	name	categories	rating	total	lat	lng
19	Tbilisi	g.Vino Underground	Wine Bar	8.3	194	41.690957	44.800773

We describe our data to check for highest rating, lowest rating, and average rating; for highest number of reviews, lowest number of reviews, and average number of reviews

	rating	total
count	25.000000	25.000000
mean	8.276000	112.960000
std	0.453946	105.599274
min	7.500000	8.000000
25%	8.100000	24.000000
50%	8.300000	81.000000
75%	8.600000	174.000000
Max	9.000000	459.000000

3.2 Next we import the data for Berlin clubs which consists of 25 samples:

	city	name	categories	rating	total	lat	lng
0	Berlin	Herr Lindemann	Cocktail	9.2	62	52.474208	13.444775
1	Berlin	Freya Fuchs	Bar	9.2	118	52.542072	13.357267
2	Berlin	Muted Horn	Beer Bar	9.2	219	52.480726	13.426297
3	Berlin	Etc:Bar	Bar	8.6	69	52.534360	13.421016
4	Berlin	Berghain	Nightclub	8.9	2296	52.511390	13.443164

We take a look at the top 5 rated venues:

	city	name	categories	rating	total	lat	lng
18	Berlin	Baden im Wein	Wine Bar	9.4	62	52.537878	13.411933
5	Berlin	Klunkerkranich	Beer Garden	9.3	2039	52.482099	13.430891
16	Berlin	Lerchen und Eulen	Bar	9.3	664	52.502030	13.430366
0	Berlin	Herr Lindemann	Cocktail	9.2	62	52.474208	13.444775
1	Berlin	Freya Fuchs	Bar	9.2	118	52.542072	13.357267

We take a look at the top 5 venues with total number of reviews:

	city	name	categories	rating	total	lat	lng
4	Berlin	Berghain	Nightclub	8.9	2296	52.511390	13.443164
5	Berlin	Klunkerkranich	Beer Garden	9.3	2039	52.482099	13.430891
15	Berlin	Monkey Bar	Cocktail	8.8	1942	52.505599	13.337249
14	Berlin	Hopfenreich	Beer Bar	8.8	828	52.499659	13.439357
23	Berlin	Salon zur wilden Renate	Nightclub	8.7	828	52.497368	13.465226

We describe our data to check for highest rating, lowest rating, and average rating; for highest number of reviews, lowest number of reviews, and average number of reviews

	rating	total
count	25.000000	25.00000
mean	8.868000	518.96000
std	0.318486	643.54911
min	8.300000	62.00000
25%	8.600000	121.00000

	rating	total
50%	8.800000	218.00000
75%	9.200000	664.00000
max	9.400000	2296.00000

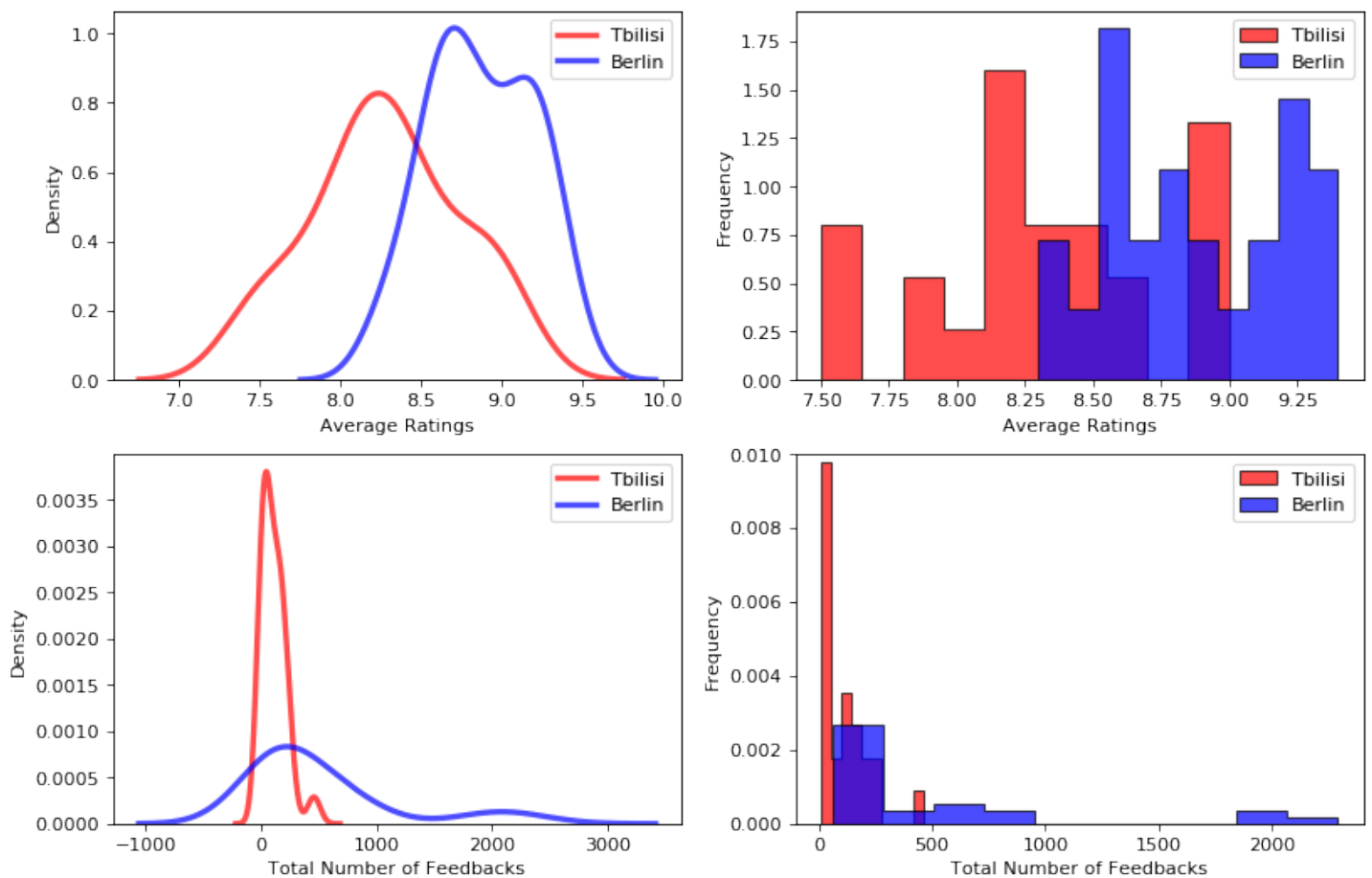
In Tbilisi the highest rated venues are 8000 Vintages and 41° Cocktail Bar, but their total number of reviews is relatively low thus the 4th best venue with 8.9 rating and 174 reviews can be considered as one of the most popular places for the nighttime fun. The lowest scoring place in the top 25 was with a 7.5 rating and the one with a minimum number of reviews with 8.

In Berlin, the highest rating was 9.2 and except 'Muted Horn' which is the beer bar, none had the significant number of reviews relative to other venues in the top 25 list. Berghain appears to be the most popular with 2286 reviews and 5th in rating. Worth noting that lowest-scoring venue in Berlin was with 8.3 and lowest number of feedbacks 62

3.3 Density and Histogram (Nightlife)

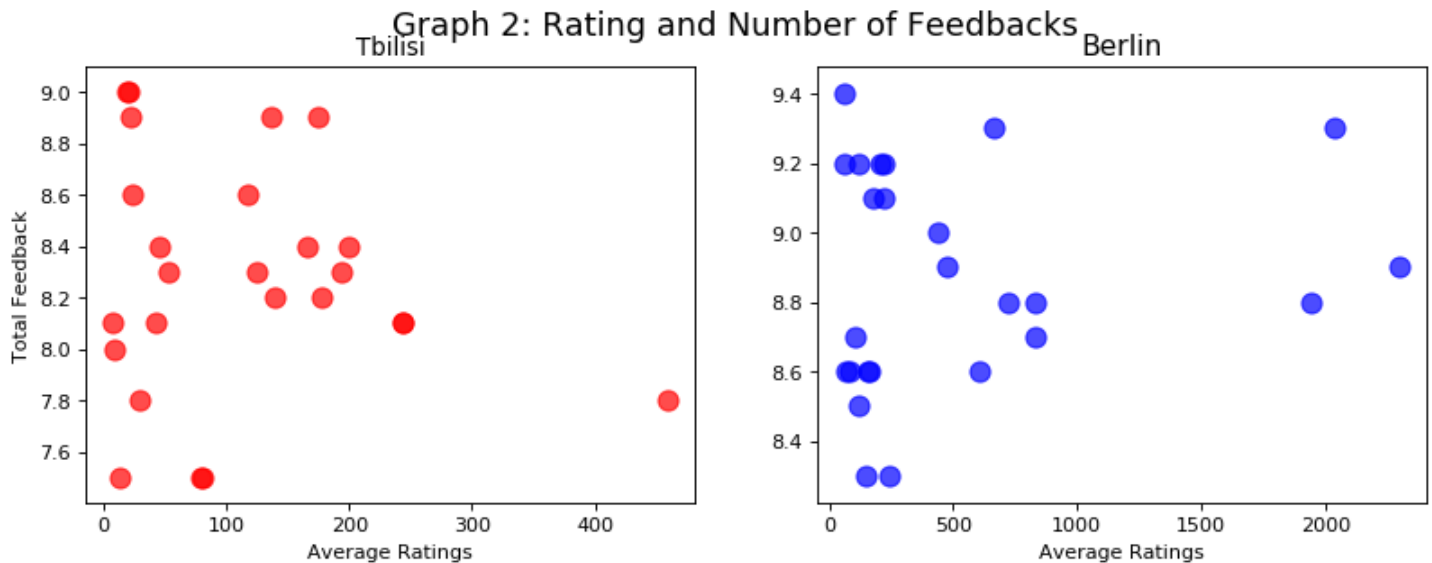
Now we take a look on how our ratings and number of feedbacks are distributed in two cities and how they compare to each other

Graph 1: Night Life



3.4 Relationship between rating and total reviews

We draw scatter graph for each city separately to find correlation between rating and number of feedbacks



3.5 Results

When we look at the distribution of ratings and number of reviews it is apparent that overall top venues have better ratings and more people have reviewed them in Berlin. This is expected as Berlin has been in the center of the nightlife for a long time and Tbilisi is just came into the picture and starting to step up its reputation. Worth noting that ratings for Tbilisi venues are more spread but the total number of reviews for each venue are closely concentrated in a small sector, which can mean that there is substation difference in the quality of venues even within the top 25 locations. However, we have the opposite picture in Berlin. The ratings are comparably concentrated, and a number of feedbacks are spread widely. This means that well trusted places are present more frequently in Berlin no matter how many people it can accommodate and how many people review them after.

If we'd like to make any assumptions, we would assume that when the number of reviews will increase average rating should become close to the natural rating, and as in general business when the number of customers increases, it is expected that the quality of service will decrease slightly. We can use average rating as the measure of quality and when we look at the scatter graphs there nothing which will confirm that with the increase in the number of reviews ratings decrease. In Tbilisi, they are distributed in a manner of a horizontal line, while in Berlin there even is a small indication of a positive slope - meaning ratings increasing with the increase in the number of reviews. Of course, sample size and the given data are not enough to make final conclusions but at the same time, there is no indication of ratings dropping as more people visit venues, thus if more people visit Tbilisi for its night clubs we should not expect lowering their ratings.

Overall ratings in both cities are satisfactory high and even though Tbilisi is substantially behind from Berlin in terms of the number of tourists per year (which will see in section 6.1) venues in Tbilisi still managed to accumulate a noticeable amount of reviews, with very good or great ratings.

4. Hotel Data Analysis

4.1 First we import the data for Tbilisi hotels which consists of 25 samples:

We We take a look at the top 5 rated hotels:

	city	name	categories	rating	total	lat	lng
4	Tbilisi	Shota @ Rustaveli Boutique Hotel	Hotel	9.5	56	41.696672	44.797108
1	Tbilisi	Rooms Hotel Tbilisi	Hotel	9.3	569	41.705597	44.786763
5	Tbilisi	Stamba Hotel	Hotel	9.3	78	41.705340	44.787449
0	Tbilisi	Radisson Blu Iveria Hotel	Hotel	9.1	459	41.704703	44.793540
6	Tbilisi	Vinotel	Hotel	9.1	96	41.698013	44.809348

We take a look at the top 5 hotels with total number of reviews:

	city	name	categories	rating	total	lat	lng
1	Tbilisi	Rooms Hotel Tbilisi	Hotel	9.3	569	41.705597	44.786763
2	Tbilisi	Holiday Inn Tbilisi	Hotel	8.9	463	41.719105	44.777424
0	Tbilisi	Radisson Blu Iveria Hotel	Hotel	9.1	459	41.704703	44.793540
10	Tbilisi	Tbilisi Marriott Hotel	Hotel	8.5	205	41.699249	44.796920
16	Tbilisi	The Biltmore Hotel Tbilisi	Hotel	8.1	137	41.702198	44.794397

We describe our data to check for highest rating, lowest rating, and average rating; for highest number of reviews, lowest number of reviews, and average number of reviews

	rating	total
count	25.00000	25.000000
mean	8.58800	118.280000
std	0.44189	151.919803
min	8.00000	11.000000
25%	8.20000	26.000000
50%	8.50000	66.000000

	rating	total
75%	9.00000	129.000000

max	9.50000	569.000000
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4.2 Next we import the data for Berlin hotels which consists of 25 samples:
 We take a look at the top 5 rated hotels:

	city		name	categories	rating	total	lat	lng
2	Berlin		Das Stue	Hotel	9.4	230	52.509703	13.345545
0	Berlin		Michelberger Hotel	Hotel	9.3	754	52.504730	13.447533
1	Berlin	25hours Hotel	Bikini Berlin	Hotel	9.3	335	52.505691	13.337917
9	Berlin		Hotel Zoo	Hotel	9.3	192	52.503974	13.329216
11	Berlin		Hotel am Steinplatz	Hotel	9.2	88	52.507994	13.327032

We take a look at the top 5 hotels with total number of reviews:

	city		name	categories	rating	total	lat	lng
22	Berlin		Soho House	Hotel	8.8	1201	52.528464	13.415202
0	Berlin		Michelberger Hotel	Hotel	9.3	754	52.504730	13.447533
8	Berlin	Hotel Adlon Kempinski	Berlin	Hotel	8.9	541	52.515960	13.380057
3	Berlin		The Ritz-Carlton, Berlin	Hotel	9.0	470	52.510170	13.375443
15	Berlin		InterContinental Berlin	Hotel	8.6	462	52.507201	13.345315

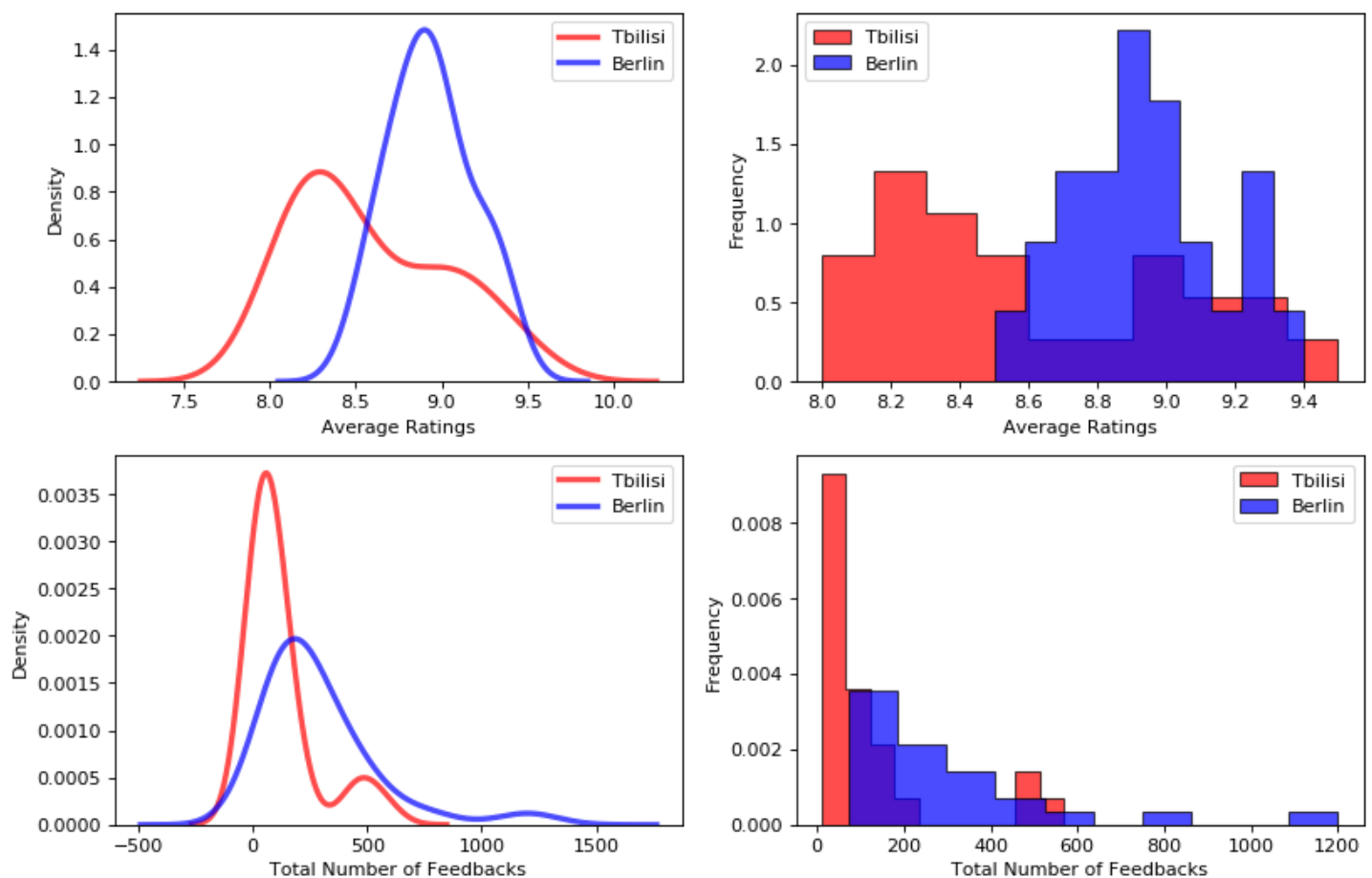
We describe our data to check for highest rating, lowest rating, and average rating; for highest number of reviews, lowest number of reviews, and average number of reviews

	rating	total
count	25.000000	25.000000
mean	8.936000	290.400000

	rating	total
std	0.241316	253.134681
min	8.500000	73.000000
25%	8.800000	119.000000
50%	8.900000	198.000000
75%	9.100000	361.000000
max	9.400000	1201.000000

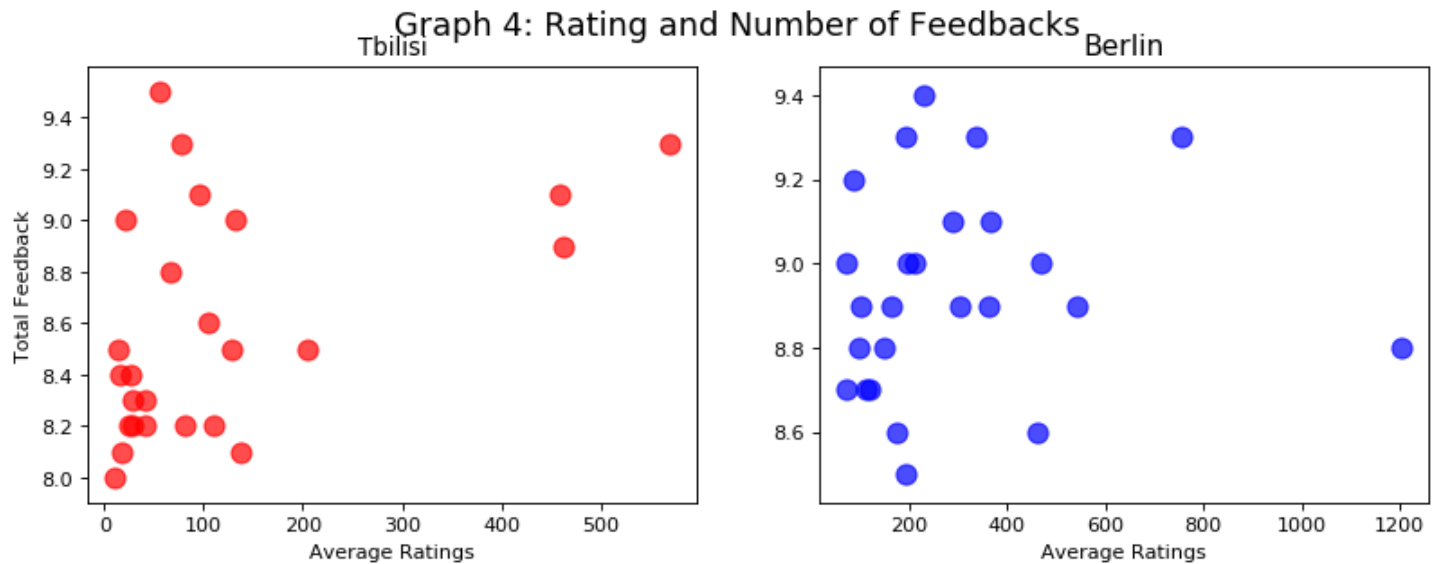
4.3 Density and Histogram (Hotels)

Graph 3: Hotels



4.4 Relationship between rating and total reviews

We draw scatter graph for each city separately to find correlation between rating and number of feedbacks



4.5 Results

Hotels are distributed in a similar manner, but in this case, for Tbilisi, the number of reviews is not as densely concentrated but is spread a little bit more. For Berlin distribution of ratings is tighter than it was for venues.

The histogram shows that a bigger portion of ratings are in a range of 8 to 8.6 in Tbilisi and 8.5 to 9.3 in Berlin. We can say that in terms of Hotels Tbilisi is closer to Berlin for ratings and number of reviews than it is in terms of venues. This can be explained by the fact that hotels attract a variety of customers who travel for different purposes and their expectations for a pleasant stay are relatively simple than the expectations when visiting a club or a bar and expecting to have a good time. Simply stating there are way more variables involved for the experience to be positive in venues than in hotels where you look for cleanliness, quietness, and pleasant personnel.

Looking at a scatter graph for Tbilisi it even shows that the hotels with one of the biggest number of reviews also have relatively high ratings. The positive slope will give an optimistic expectation that with the increase in visitors quality will not decrease.

Comparable high ratings and number of reviews suggest that in both cities you will be able to find an easily good stay. When we examined the names of the hotels, we saw some international hotels present that, which means expected quality will be similar in those instances. Long story short, hotels will complement positive experiences found in the venues in both cities.

5. Maps

5.1 Map of Tbilisi

We combine data for clubs and hotels to map them together

	city	name	categories	rating	total	lat	lng
0	Tbilisi	Bassiani	Nightclub	8.9	174	41.722853	44.791265
1	Tbilisi	Cocktail Factory	Cocktail Bar	8.9	22	41.708046	44.779971

	city	name	categories	rating	total	lat	lng
2	Tbilisi	Bauhaus	Bar	8.4	45	41.701192	44.803416
3	Tbilisi	8000 Vintages	Wine Bar	9.0	19	41.708375	44.758914
4	Tbilisi	Dadi Wine Bar and Shop	Wine Bar	8.9	137	41.692802	44.801873

```

Hotel      25
Nightclub  8
Bar         6
Cocktail Bar 4
Wine Bar   4
Pub        1
Dive Bar   1
Lounge     1

```

Name: categories, dtype: int64

We substitute categorical values of column `categories` with integers for clustering

	city	name	categories	rating	total	lat	lng
0	Tbilisi	Bassiani	1	8.9	174	41.722853	44.791265
1	Tbilisi	Cocktail Factory	4	8.9	22	41.708046	44.779971
2	Tbilisi	Bauhaus	2	8.4	45	41.701192	44.803416
3	Tbilisi	8000 Vintages	3	9.0	19	41.708375	44.758914
4	Tbilisi	Dadi Wine Bar and Shop	3	8.9	137	41.692802	44.801873

We obtain central geograpical coordinates of Tbilisi

We create folium map with 6 clusters collor coded

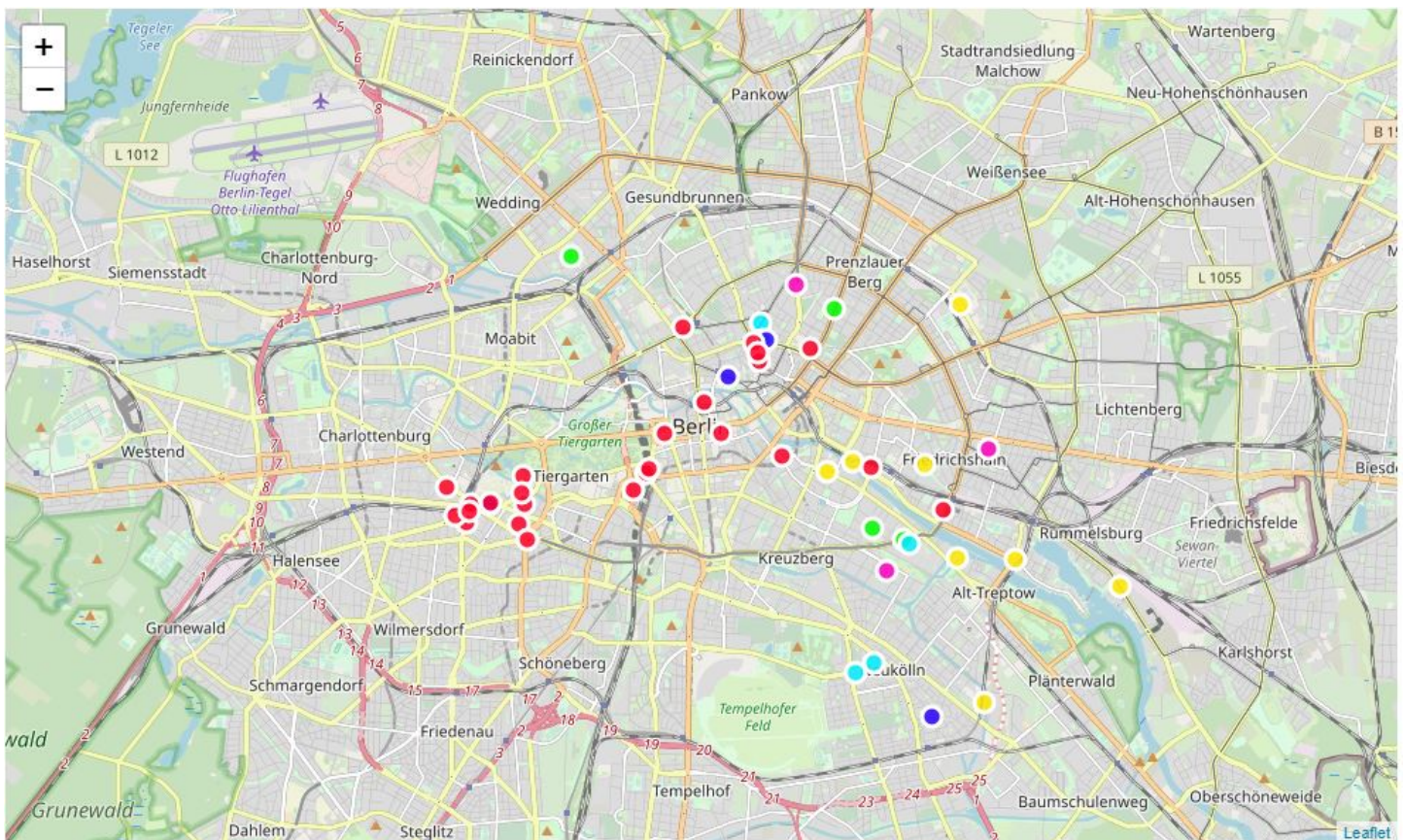
- Red - Hotels
- Yellow - Nightclub
- Green - Bar
- Cyan - Wine Bar
- Pink - Cocktail Bar
- Blue - Pub, Lounge, Dive Bar

Name: categories, dtype: int64

	city	name	categories	rating	total	lat	lng
0	Berlin	Herr Lindemann	4	9.2	62	52.474208	13.444775
1	Berlin	Freya Fuchs	2	9.2	118	52.542072	13.357267
2	Berlin	Muted Horn	3	9.2	219	52.480726	13.426297
3	Berlin	Etc:Bar	2	8.6	69	52.534360	13.421016
4	Berlin	Berghain	1	8.9	2296	52.511390	13.443164

The geograpical coordinate of Berlin, Germany are 52.5170365, 13.3888599.
We create folium map with 6 clusters collor coded

- Red - Hotels
- Yellow - Nightclub
- Green - Bar
- Cyan - Cocktail
- Pink - Wine Bar, Pub
- Blue - Beer Garden



5.3 Results

Here is some good news for Tbilisi. When looking at the map we see that the majority of top venues and hotels are located close to the central area and they are located close to each other. We can state that their locations are intertwined with close clusters. This can be a great advantage for the visitors. Not only tourists can save time and money on transportation costs when moving from one spot to another, but this will also allow for better walks and enjoyment of cultural treasures the city can offer. Perfect setup for clubbing, resting, and sightseeing.

While in Berlin you have nearly all the hotels separated from the top venues and clustered together in the west part of the city when main nightclubs are located on the other side (eastern) part of Berlin. Even other types of venues are a bit far from the center and especially from where best hotels are. This arrangement in Berlin combined with heavy traffic and taxi fares give Tbilisi a massive advantage that can be a conclusive to many visitors.

6. Other Statistics

6.1 International visitors from 2014 to 2018

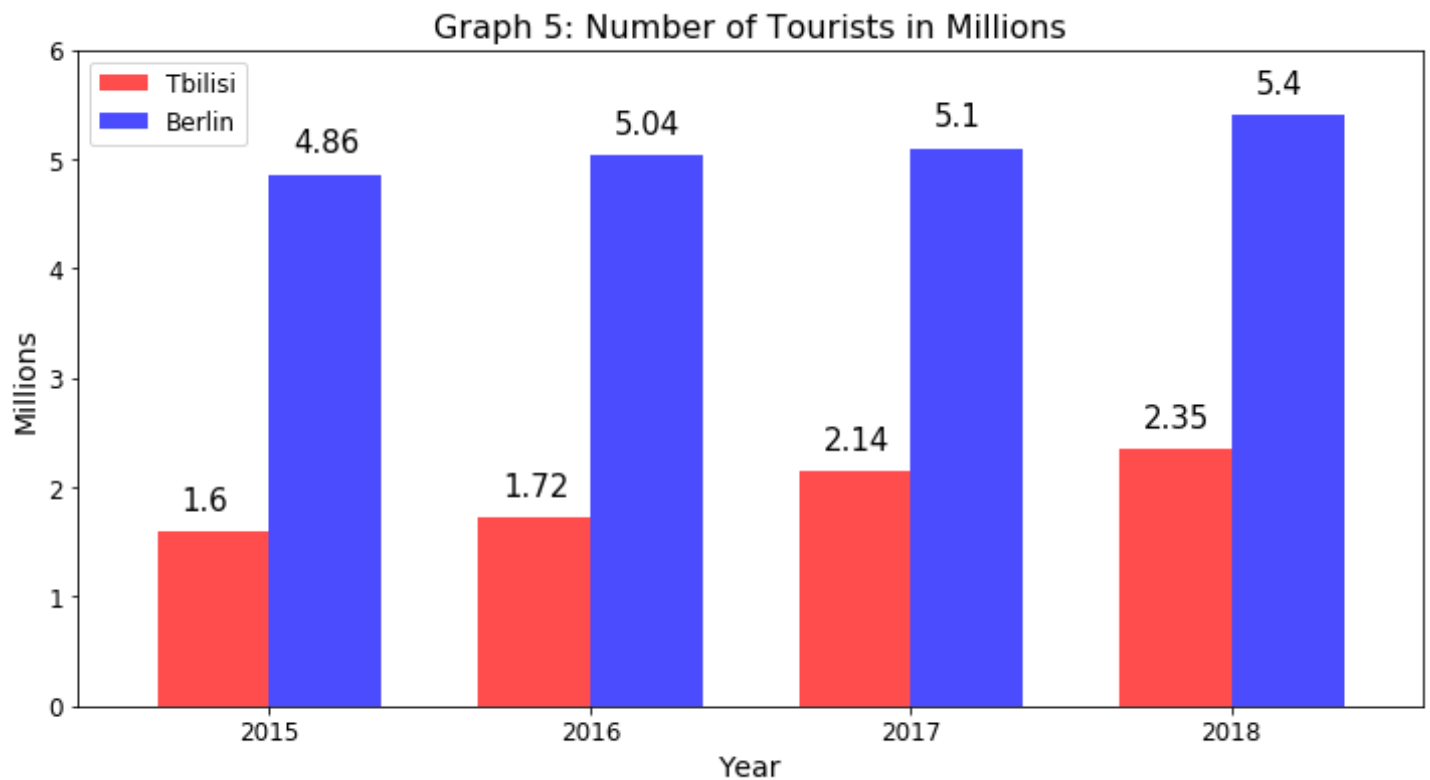
We import the csv file and set first row as index and first column as header

	2015	2016	2017	2018
city				
Tbilisi	1.60	1.72	2.14	2.35
Berlin	4.86	5.04	5.10	5.40

We use function `transpose` to revert data which will be easier to plot as a bar chart

city	Tbilisi	Berlin
2015	1.60	4.86
2016	1.72	5.04
2017	2.14	5.10
2018	2.35	5.40

We plot the bar graph for each year with Tbilisi and Berlin side by side for a better comparison in the number of visitors



6.2 Taxi Rates

**This is an estimated fare. The actual fare might differ due to time of the day, tolls, works (available routes), different car companies, error in collecting prices and other human or software error.*

We import the csv file and set first row as index and first column as header

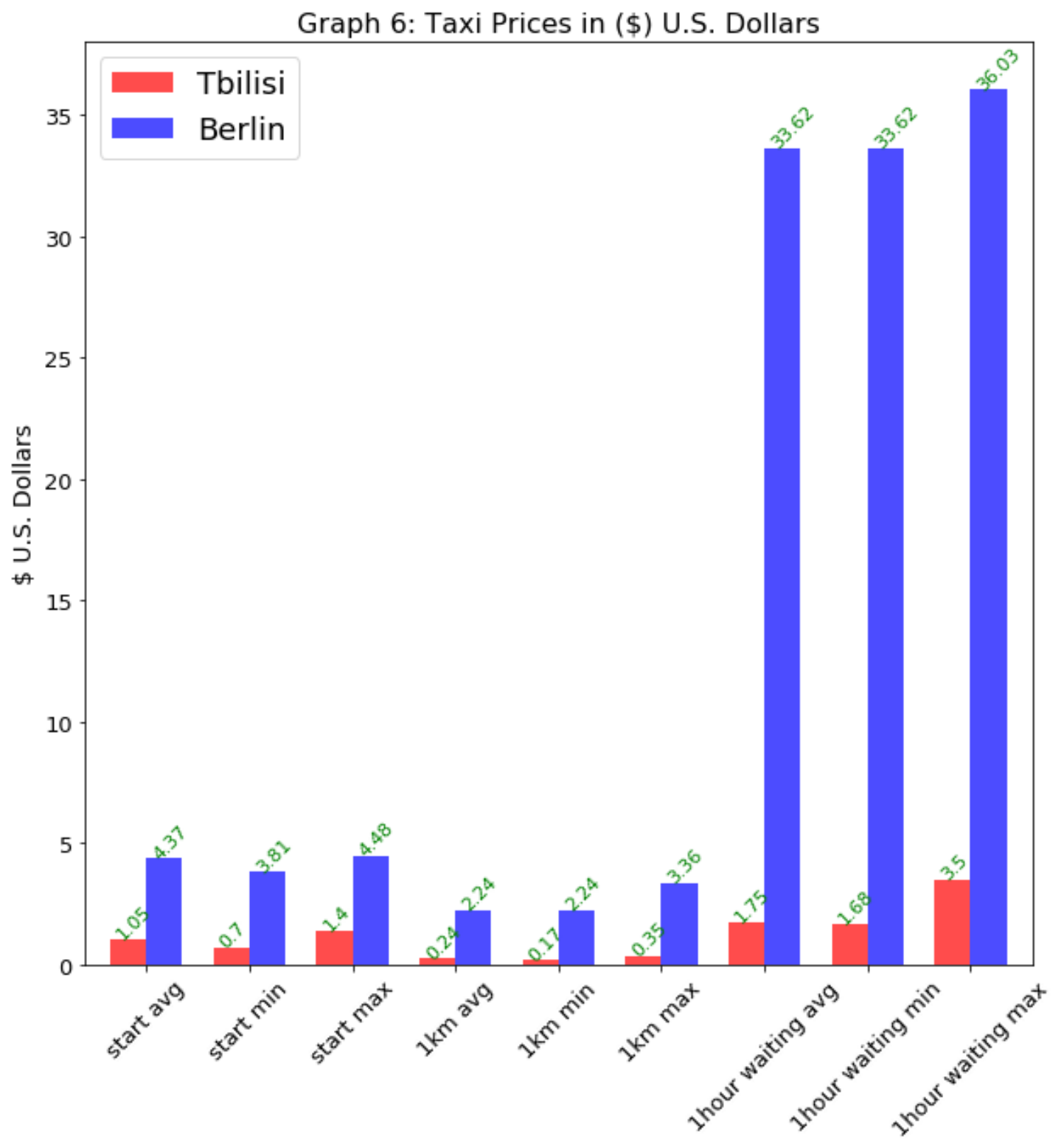
	start avg	start min	start max	1km avg	1km min	1km max	1hour waiting avg	1hour waiting min	1hour waiting max
city									
Tbilisi	1.05	0.70	1.40	0.24	0.17	0.35	1.75	1.68	3.50
Berlin	4.37	3.81	4.48	2.24	2.24	3.36	33.62	33.62	36.03

We use function `transpose` to revert data which will be easier to plot as a bar chart

city	Tbilisi	Berlin
start avg	1.05	4.37
start min	0.70	3.81
start max	1.40	4.48

city	Tbilisi	Berlin
1km avg	0.24	2.24
1km min	0.17	2.24

We plot the bar graph for each year with Tbilisi and Berlin side by side for a better comparison in the number of visitors



6.3 Crime Rates

- This section is based on surveys from visitors of this website. Questions for these surveys are similar to many similar scientific and government surveys.
- Each entry in the survey is saved as the number in the range [-2, +2], with -2 having meaning of strongly negative and +2 meaning of strongly positive.
- We filter surveys to eliminate potential spam, like people entering a large amount of data which are differentiating from the median value.
- To present survey result, we use the scale [0, 100] for values since it is easier to read for users.
- To generate a current index (which is always updated) we use data up to 36 months old. We include only cities for which there are at least a certain number of contributors. Our semiannual index is remade twice per year by pushing current index into this historical view.
- Crime Index is an estimation of overall level of crime in a given city or a country. We consider crime levels lower than 20 as very low, crime levels between 20 and 40 as being low, crime levels between 40 and 60 as being moderate, crime levels between 60 and 80 as being high and finally crime levels higher than 80 as being very high.
- Safety index is, on the other way, quite opposite of crime index. If the city has a high safety index, it is considered very safe.

We start by importing the csv file and examining it

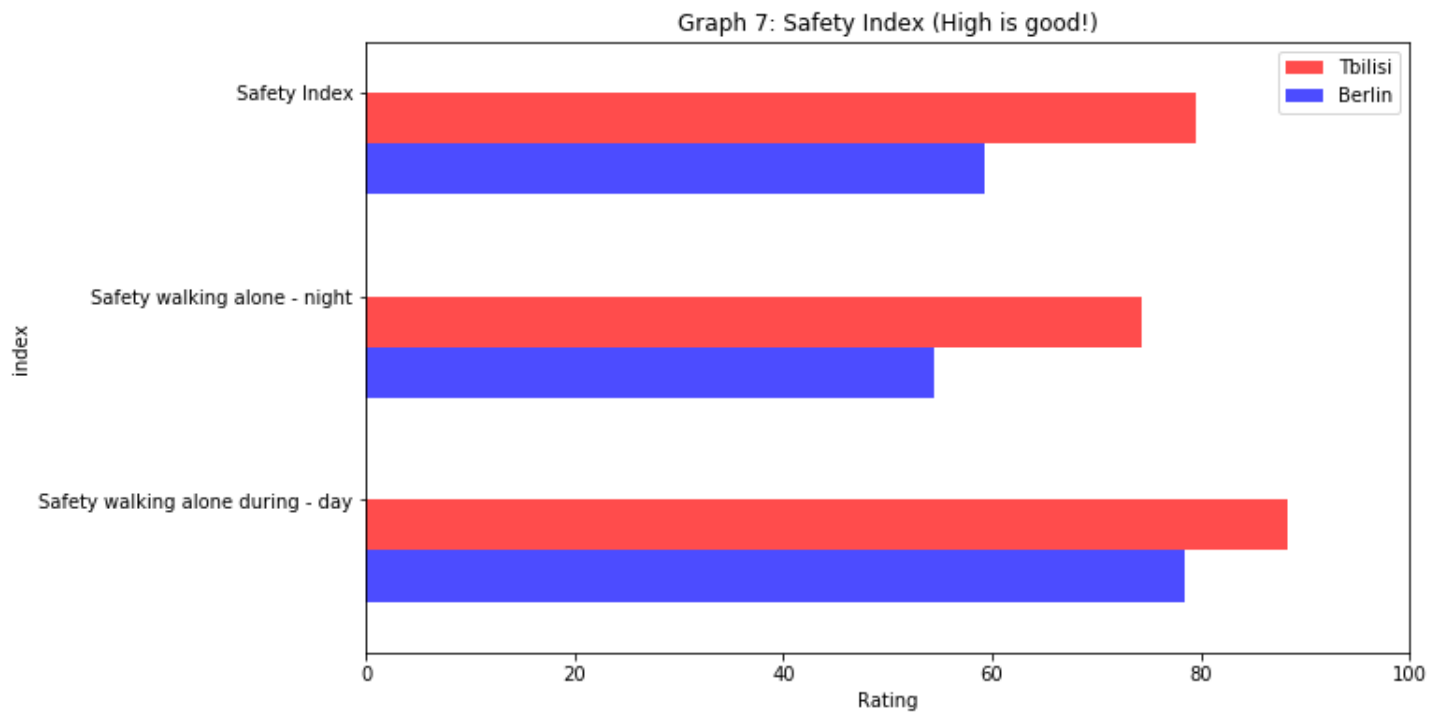
	Tbilisi	Berlin
index		
Crime Index	20.55	40.77
Safety Index	79.45	59.23
level of crime	15.69	41.52
Worries being mugged or robbed	15.33	37.98
Worries attacked	18.45	39.24
Attack because of your skin colour, ethnic origin or religion	20.78	30.73
Violent crimes such as assault and armed robbery	16.69	36.02
Safety walking alone - night	74.42	54.46
Safety walking alone during - day	88.31	78.40

We separate out dataset into parts: one with the safety ratings (Higher-better!) and crime ratings(Lower-better!)

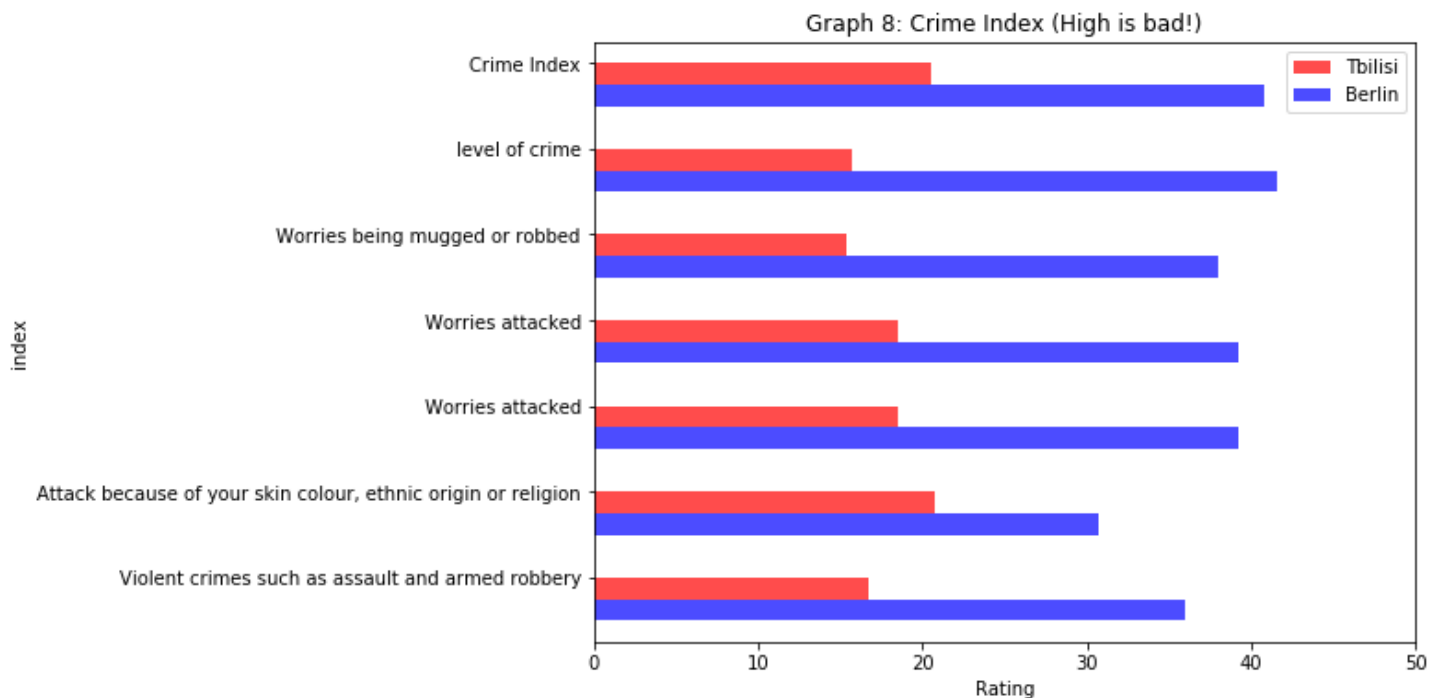
	Tbilisi	Berlin
index		
Safety Index	79.45	59.23
Safety walking alone - night	74.42	54.46
Safety walking alone during - day	88.31	78.40

	Tbilisi	Berlin
index		
Crime Index	20.55	40.77
level of crime	15.69	41.52
Worries being mugged or robbed	15.33	37.98
Worries attacked	18.45	39.24
Worries attacked	18.45	39.24
Attack because of your skin colour, ethnic origin or religion	20.78	30.73
Violent crimes such as assault and armed robbery	16.69	36.02

First we plot Safety Index graph



Now, we plot crime index graph



7. Discussion

The number of international visitors shows that while Berlin is still hosting more people, the growth trend is bigger in Tbilisi at a constant rate. Taxi fares are so cheap in Tbilisi that I will not even bother comparing findings as you can check them on your own in Graph 6. What is more important for people loving to spend a night in a foreign city is that the crime rate is relatively low in Tbilisi. Especially it appears to be less dangerous for people of color, homosexuals and different religions (Graph 8). This is a big plus for world travelers. Overall safety during the nighttime is stronger, which is the index we will concentrate as clubbing is about spending the night at the venues and then going home or at the hotel (Graph 7).

Of course, Berlin is on top of the world for the nightlife, however, we see Tbilisi is getting closer with high-quality venues and top-notch hotels. Service is more affordable in Tbilisi. Taxi fares are beyond comparable. Taxi in Tbilisi can get you where you want cheaper than it will cost you to travel by bus or metro in Berlin. That's why every year more and more people are choosing to choose Tbilisi to spend their vacations or to attend massive parties in BASSIANI or other night clubs. The market for the night entertainment is booming in Tbilisi and there is no sign that it will slow down in the near future.

If an opportunity arises, I would definitely recommend exploring Tbilisi's nightlife and even I would go saying to invest in it as it will make substantial returns as Tbilisi has the potential to establish as one of the top tourists' destination.

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