Find the Best Location to Build a Boarding/Dormitory House in Bandung Fahmi Iman Alfarizki

I. Introduction



Institut Teknologi Bandung. Source: Google

Institut Teknologi Bandung (ITB) or Bandung Institute of Technology is one of the most prestigious universities and top 3 universities in Indonesia. It is located in Bandung, West Java, Indonesia. I was a student there. Since it is a top campus, many students come from out of Bandung to study at ITB so that many students need a dormitory house. It is a big opportunity for the locals to open the dormitory house business.

I have a family member who lives in Bandung and wants to open a business. I have suggested him to build a dormitory house near ITB since it will give a huge revenue. Luckily, He is really excited and wants to open his dormitory house business near ITB. However, He does not know where the best location to open a dormitory house. He has two main considerations that are (1) the location is near to ITB and (2) there are a lot of restaurants, food sellers, and drink sellers. Why he thought that those considerations are suitable because in common, Indonesian students who live outside their hometown do not want to cook their meal and it is more convenient if they just buy food at restaurants, food trucks, etc. Also, if the location is near to the campus, the students do not spend much time to go to the campus and they can save their time and energy for another thing. I see that this project will attract people who want to build a dormitory house.

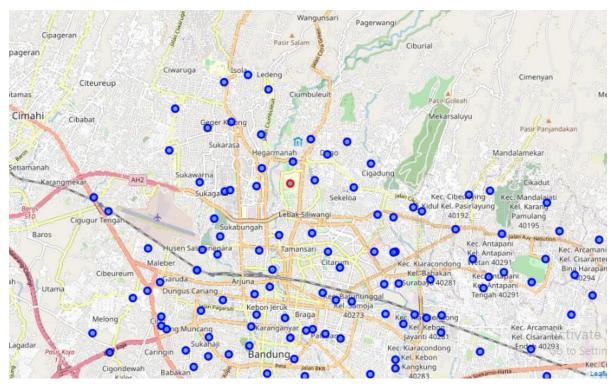
II. Data

In this project, I used geolocation data of neighborhoods in Bandung from Bandung Data Portal (http://data.bandung.go.id/beta/index.php/portal/detail_dataset/koordinat-dan-ketinggian-kantor-kelurahan-di-kota-bandung). The data is provided by the government based on the location of the neighborhood offices. Others, I obtained the coordinate of ITB from geopy package, and the list of venues in the neighborhood is obtained from Foursquare API.

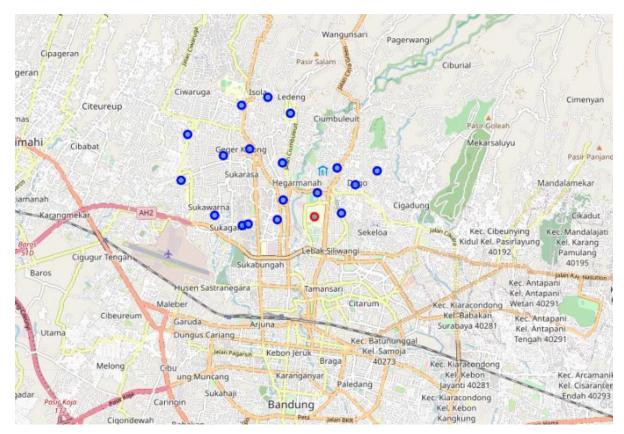
III. Methodology

- 1. Find the neighborhoods which are nearby ITB using KMeans clustering. KMeans is used since the KMeans gives the desired result.
- 2. Find the restaurants, food shops, and drink shops in those neighborhoods using Foursquare API
- 3. Determine which neighborhoods are nearby ITB and there are a lot of restaurants, food shops, and drink shops

IV. Result and Discussion



Bandung map which the center is ITB coordinate (a red point). The blue points are the center of the neighborhood



This map shows the cluster in which ITB is included. The cluster is obtained from KMeans clustering.

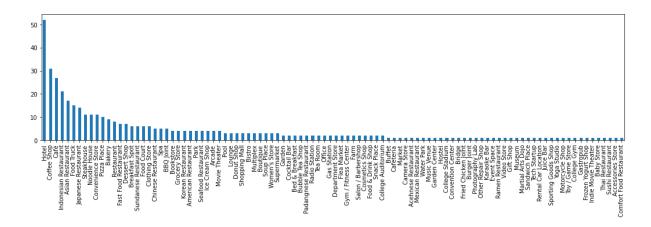
After I determined which neighborhoods are nearby ITB, then I find the restaurants, food shops, and drink shops in each neighborhood using Foursquare API. Below I attached the sample of the table.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Cigadung	-6.8799	107.6251	Bumi Bandhawa Hotel	-6.884334	107.625629	Hotel
1	Cigadung	-6.8799	107.6251	Bumi Samami	-6.883770	107.623223	Garden
2	Cigadung	-6.8799	107.6251	Little Wings Cafe And Library	-6.876569	107.623308	Café
3	Cigadung	-6.8799	107.6251	Lotus Hotel, Cafe & Meeting Place	-6.880740	107.620904	Hotel
4	Cipaganti	-6.8867	107.6030	Grand Tjokro Hotel	-6.886269	107.604075	Hotel

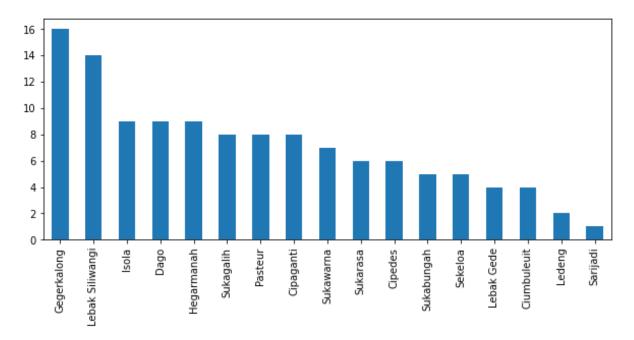
428 429	Ledeng	-6.8627	107.5994	Kolam Renang Bukit Cipaku	-6.862128	107.602271	Pool
	Ledeng	-6.8627	107.5994	The Travel Hotel Cipaganti	-6.861257	107.599949	Hotel
430	Ledeng	-6.8627	107.5994	Augusta valley hotel bandung	-6.863893	107.598334	Hotel
431	Ledeng	-6.8627	107.5994	Casa d'Ladera	-6.861999	107.596340	Hotel
432	Ledeng	-6.8627	107.5994	Bubur Ayam Isola	-6.859678	107.596999	Food Truck

433 rows × 7 columns

Then, I did an exploratory data analysis to look up the venue categories and how much the venues are for each category.



The categories did not satisfy me since the categories are still not general e.g. Restaurants, Hotels, etc. Therefore, I took the data in which the categories contain 'restaurant', 'food', 'drink' only for further analysis. Then, I grouped the data by the neighborhood and I obtained this graph.



From the graph above, we know that the neighborhoods which have a lot of food sellers, restaurants, and drink sellers are Gegerkalong and Lebak Siliwangi. However, if we have to choose one location, which is the best? Best on the problem, my sibling needs a location that is nearby ITB. Therefore, I measured the distance between the locations and ITB.

		Kelurahan	Lintang Selatan	Bujur Timur	Cluster	Distance
	134	Lebak Siliwangi	-6.88499	107.61108	8	0.005669
	146	Gegerkalong	-6.87480	107.59520	8	0.021877

Lebak Siliwangi is the nearest neighborhood to ITB

V. Conclusion

Based on the analysis, the best location for building the dormitory house is Lebak Siliwangi since it has a lot of restaurants, food sellers, and drink sellers. Also, it is the nearest location to ITB.