

# Capstone Project – The Battle of Neighborhoods | Finding a Better Place Angeles City, Pampanga, Philippines

## 1. Introduction:

The purpose of this Capstone Project is to help people in exploring better facilities around their neighborhood.

Angeles City, Pampanga, where I stayed for 14 years, I was assigned in this neighborhood because of my work from previous company. The city is a 1st class highly urbanized city in the province of Pampanga, where it is geographically situated but remains politically independent. It is located in the region of Central Luzon, Philippines.

Due to new development in the region. Angeles City will be the main hub to Mega City in Central Luzon, with Clark International Airport under construction and is expected to be finished this year 2020.

Problem statement: Prospects of a Business establishment specially restaurant, close to office areas, and urban areas in Angeles City, Philippines.

During the daytime, especially in the lunch and dinner hours, office areas provide huge opportunities for restaurants. Reasonably priced Php150 – Php250 pesos shops are usually always full during the lunch hours (11 am — 2 pm) and, given this scenario, we will go through the benefits and pitfalls of opening a lunch cum dinner restaurant in highly dense urban places.

The core of Angeles City is made of 33 barangay but, we will only concentrate on 10 most populated barangay.

### Target Audience

1. Business personnel who wants to invest or open a restaurant. This analysis will be a comprehensive guide to start or expand restaurants targeting the large pool of office workers in Angeles City and adjacent cities during lunch hours.
2. Freelancer who loves to have their own restaurant as a side business. This analysis will give an idea, how beneficial it is to open a restaurant and what are the pros and cons of this business.
3. New graduates, to find reasonable lunch/breakfast place close to office.
4. Budding Data Scientists, who want to implement some of the most used Exploratory Data Analysis techniques to obtain necessary data, analyze it, and, finally be able to tell a story out of it.

## 2. Data Preparation:

- 2.1. Get the barangay names, Population and Land Area of each barangay from citypopulation and government website in the Philippines.

First make use of barangay population table of Angeles City page from City Population. I have used Pandas, Lxml and BeautifulSoup4 library to create the initial data-frame. And use same library for land area of each barangay from Philippines government website. For a clean and understandable data-frame, I renamed some of the barangay for data-frame merging. Using top 10 populated barangay, this will be use to get the most venues within 2 kilometers radius of each area later on.

	Barangay	Area Sqm	Population2005	Population2010	Population2015
0	Agapito del Rosario	139,855	3,102	2,313	3,230
1	Amsic	1,521,162	3,474	7,736	14,379
2	Anunas	3,946,577	7,817	15,213	20,911
3	Balibago	2,648,768	27,914	32,291	40,087
4	Capaya	2,564,281	6,661	8,280	8,870
5	Claro M. Recto	179,228	5,691	4,741	3,981
6	Cuayan	4,139,180	1,645	4,852	10,363
7	Cutcut	4,082,166	22,462	21,601	27,843
8	Cutud	2,125,116	2,230	16,531	23,177
9	Lourdes Northwest	440,460	11,429	10,450	9,896
10	Lourdes Sur	210,199	5,943	4,772	4,797
11	Lourdes Sur East	206,663	5,880	4,656	4,741
12	Malabanias	2,625,601	19,169	23,034	33,174
13	Margot	2,312,225	2,768	3,606	5,239

	Barangay	Area Sqm
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12	Lourdes Sur East	206,663

## 2.2. Get the coordinates of the top 10 barangay.

Some of the coordinates returned by Geopy library are wrong and some are missing using Nominatim and I have to correct using their barangay hall address and correct also the naming of each barangay and get the correct coordinates using Google API.

	Barangay	Area Sqm	Population2005	Population2010	Population2015	Geo_data	Latitude	Longitude
0	Agapito del Rosario	139,855	3,102	2,313	3,230	Agapito del Rosario Barangay Hall, Angeles, Pa...	15.141864	120.590848
1	Amsic	1,521,162	3,474	7,736	14,379	Amsic Barangay Hall, Angeles, Pampanga, Philip...	15.155718	120.571175
2	Anunas	3,946,577	7,817	15,213	20,911	Anunas Barangay Hall, Angeles, Pampanga, Phil...	15.155556	120.553550
3	Balibago	2,648,768	27,914	32,291	40,087	Balibago Barangay Hall, Angeles, Pampanga, Phi...	15.166296	120.590899
4	Capaya	2,564,281	6,661	8,280	8,870	Capaya Barangay Hall, Angeles, Pampanga, Phil...	15.145857	120.616836
5	Claro M. Recto	179,228	5,691	4,741	3,981	Claro M. Recto Barangay Hall, Angeles, Pampang...	15.146734	120.591412
6	Cuayan	4,139,180	1,645	4,852	10,363	Cuayan Barangay Hall, Angeles, Pampanga, Phil...	15.146772	120.548620
7	Cutcut	4,082,166	22,462	21,601	27,843	Cutcut Barangay Hall, Angeles, Pampanga, Phil...	15.137750	120.581956
8	Cutud	2,125,116	2,230	16,531	23,177	Cutud Barangay Hall, Angeles, Pampanga, Philip...	15.172503	120.627258

### 2.3. Foursquare Data

Finally I make use of Foursquare API to obtain the most common venues within 2 kilometers of each top 10 barangay.

	Barangay	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Balibago	15.166296	120.590899	Velvet VIP Lounge	15.165926	120.589953	Lounge
1	Balibago	15.166296	120.590899	Fortune Hong Kong Seafood Restaurant	15.165954	120.590142	Chinese Restaurant
2	Balibago	15.166296	120.590899	Yisan Korean Restaurant	15.167593	120.589138	Buffet
3	Balibago	15.166296	120.590899	Pigs and Pints	15.163581	120.589602	Cocktail Bar
4	Balibago	15.166296	120.590899	Jollibee	15.167092	120.589937	Fast Food Restaurant
...	...	...	...	...	...	...	...
95	Pulung Maragul	15.160082	120.608663	Pizza Hut	15.162700	120.609000	Pizza Place
96	Pulung Maragul	15.160082	120.608663	Gerry's Grill	15.163822	120.609764	Filipino Restaurant
97	Pulung Maragul	15.160082	120.608663	Toll House	15.163223	120.609634	Snack Place