

CAPSTONE PROJECT - The Battle of the Neighborhoods

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1. Introduction

1.1. Background

Istanbul is a very large city with a population of nearly 16 million. It has a population density of 2844 people per square kilometer. Its population increased over 1 million in last 5 years. The city divided into 39 Boroughs and 782 Neighborhoods. Being such a crowded city leads some health problems in aspects of citizens, especially nowadays when COVID-19 seriously threaten humanity. With a high population, health service planning becomes one of the major responsibilities for government and local managements.

1.2. Problem

Authorities should effectively determine areas with weak health services and medical establishments and orient the funds for developments of health services in those areas. This project aims to classify areas according to their health and medical capabilities and find optimal locations for enhancing health service points and medical establishments. So the target audience is clearly authorities, who is liable for planning and serving health and medical services in Istanbul.

2. Data Description

2.1. Data Sources

- Based on definition of problem, lots of factors that will influence the decision should be considered as a parameter. For example number of existing medical establishments, number of beds, capabilities of emergency service or ambulance, number of intensive care units, number and branches of medical service personnel, number and type of diagnosis devices are some of them. But much of this information is not public. So only open data will be used in this project. These are :
- number of existing medical establishments in the neighborhood (specific type of health care services)
- number of beds, if any
- capabilities of emergency service or ambulance

Following data sources will be needed to extract/generate the required information:

- Centers of Boroughs will be generated by using **Google Maps**
- Coordinate of Istanbul center obtained using **geopy geolocator**
- Number of medical establishments and their type and location in every neighborhood will be obtained using **Istanbul Municipality Open Data Platform**
- The Data is in the form of CSV. It is provided by Istanbul Municipality IT Department at their Open Data Platform. This is the link for the data.

<https://data.ibb.gov.tr/dataset/bd3b9489-c7d5-4ff3-897c-8667f57c70bb/resource/f2154883-68e3-41dc-b2be-a6c2eb721c9e/download/salk-kurum-ve-kurulularna-ait-bilgiler.csv>

2.2. Data Cleaning and Preparing

Data set will be acquired from Istanbul Municipality Open Data Platform in CSV format. It includes names and types of those establishments, Boroughs, Neighborhoods, communication info, their capabilities such as emergency service, ambulance, number of beds and geolocal information. Unnecessary columns will be dropped so we can focus our main purposes. Column names and records are in Turkish, they are causing some problems with utf-8 encoding so we will translate them to English and manipulate some of them. We will drop some records that include only side health services (for example dialysis centers, veterinaries, physical rehabilitation centers) We will convert 'Ambulance' and 'Emergency_Service' column records to numerical data so we can use them. 1 will refer to existence and 0 will refer to non-existence. We will also drop rows that 'Ambulance','Emergency_Service' and 'Bed' records includes NaN values.

	Borough	Name	Sub_Category	Emergency_Service	Bed	Ambulance	Neighborhood	Latitude	Longitude
4	KADIKÖY	Medipol Üniversitesi Hastanesi Kadıköy	University Hospital	1	72.0	1	KOĞUYOLU	41.004663	29.034348
10	ADALAR	Adalar 1 Nolu Acil Yardım Ystasyonu	Emergency Station	0	3.0	1	MADEN	40.874674	29.132746
21	FATİH	İstanbul Eğitim ve Araştırma Hastanesi	Education and Research Hospital	1	507.0	0	CERRAHPAŞA	41.003074	28.938300
43	KARTAL	Kartal Köyü Yüce Yhtis Eğitim ve Araştırma Hastanesi	Education and Research Hospital	1	465.0	0	CEVİZLİ	40.915824	29.171704
44	SİSLİ	Özel Yac İstanbul Aesthetic Tıp Merkezi	Private Medical Center	1	8.0	0	ESENTEPE	41.069186	29.006582
54	SİLİVRİ	Silivri Devlet Hastanesi Selimpaşa Ek Hizmet Bldi	State Hospital	1	35.0	1	SELİMPAŞA	41.054333	28.379361
57	FATİH	İstanbul Haseki Eğitim ve Araştırma Hastanesi ...	Education and Research Hospital	1	125.0	0	HIRKA-YERİF	41.020465	28.937514