Seeking the perfect neighborhood to open a new Mediterranean restaurant in Los Angeles

En búsqueda del vecindario ideal para abrir un restaurante mediterráneo en Los Ángeles

Final Course Project for the
IBM Data Science Professional Certificate

coursera IBM

Author/date:
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October 2022

Abstract

The client is arriving to the city of Los Angeles as his partner has been offered a wonderful job opportunity in this city. Not ever having visited the United States, he would like to check some neighborhoods in order to accomplish his dream of opening a Mediterranean restaurant. He wants to establish his business in a proper neighborhood where it can flourish.

In the present Data Science project, I will obtain geographical data of Los Angeles, as well as the already existing business in order to provide the client with a selection of the most proper areas to set his business.

Resumen

El cliente llega a la ciudad de Los Ángeles, ciudad donde su pareja ha aceptado una oferta de trabajo. Al no haber visitado nunca los Estados Unidos, le gustaría comprobar algunos barrios para cumplir su sueño: abrir su propio restaurante de cocina mediterránea. Quiere establecer su negocio en un barrio adecuado donde pueda prosperar.

En este proyecto de Data Science, obtendré datos geográficos de Los Ángeles, así como de los negocios ya existentes, para proporcionar al cliente una selección de las zonas más adecuadas para establecer su negocio.

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Preamble

Arriving to an unknown city can sometimes be intimidating when it concerns looking for a place to live or finding the right property to set your own business ant make it flourish. This problem becomes even more exacerbated when the city is too big to get to know it in some days. This is exactly what is happening to my friend Caesar Alexopoulos.

Mr. Alexopoulos is a Greek chef whose wife Gabriella has been offered a marvelous job as co-editor in an emerging fashion magazine. The office is located in Los Angeles, but neither of them have gotten to know this huge and widespread city, but both know that it has a lot of business opportunities.

Caesar and Gabriella are eager to start their new lives in California. Furthermore, Mr. Alexopoulos is willing to take up a new challenge and apply his Mediterranean chef skills and invest some of his savings in a brand-new restaurant in LA. He is willing to set his restaurant in an area which economy already revolves around leisure, dining and lunch, but wants his restaurant specialties to outstand from the nearby business. Also, he wants to offer food shipping to close neighborhoods, so staying close to residential areas is preferred.

Objectives

The main purpose of this study is to make use of the available data to create an initial food and restaurant business map of the Los Angeles city that can help the client select the ones in which his new

Introducción y antecedentes

Antecedentes

Integrarse en una nueva ciudad puede ser en intimidante, especialmente cuando se trata de encontrar un nuevo hogar para vivir o de elegir el mejor local para un nuevo negocio. Este problema se vuelve especialmente grave cuando la ciudad es demasiado grande como para llegar a conocerla en unos pocos días. Esto es lo que le está sucediendo a mi amigo Caesar Alexopoulos.

El Sr. Alexopoulos es un chef griego cuya esposa Gabriella ha conseguido un maravilloso trabajo como editora en una revista de moda emergente. La oficina se encuentra en Los Ángeles, pero ninguno de los dos ha llegado a conocer esta amplia ciudad, que tiene muchas oportunidades de negocio.

Caesar y Gabriella están deseando iniciar su nueva vida en California. Es más, el Sr. Alexopoulos está más que ilusionado con asumir un nuevo reto y aplicar sus conocimientos de chef mediterráneo invirtiendo parte de sus ahorros en su propio restaurante en Los Ángeles. Está dispuesto a instalar su restaurante en una zona cuya economía ya gira en torno al ocio, la gastronomía y la comida, pero quiere que las especialidades de su restaurante destaquen sobre las de los negocios cercanos. Además, quiere ofrecer envíos a los barrios cercanos, por lo que prefiere establecerse relativamente cerca de zonas residenciales.

Objetivos

El propósito principal de este estudio es hacer uso de los datos disponibles para ofrecer un mapa inicial de los negocios de restauración de la ciudad de Los Ángeles que ayude al cliente a seleccionar aquellos donde su nuevo restaurante pueda tener más éxito y clientes.

Methodology

Approach

The problem at hands calls for a descriptive approach that can distinguish between different types of neighborhoods.

To achieve this goal, several methods of unsupervised classification will be explored, and the one that yields the most appropriate results will be used for the subsequent analysis. The adequateness of the results will be evaluated with regards of the geographical homogeneity of the clusters/classes, the soundness of the number of groups, and the clarity of the statistical differences of the different groups.

Data and data sources

The data to be employed in order to help Mr. Alexopoulos' decision will be:

- The list of neighborhoods from Los Angeles. All the neighborhoods are listed in the wikipedia page
- The geolocation of each neighbor. The "*geometric center*" of each neighborhood/community will be obtained from the geocoder package, that includes mapping information from google, bing, OpenStreetMap, and arcGIS.

The list of places and their categories in each neighborhood, as provided by the social app FourSquare, though its developer API. These dataset will allow to identify around what kind economic activity the neighborhood revolves around.

Metodología

Enfoque

El problema tratado, por su naturaleza, requiere un enfoque descriptivo, de forma que permita distinguir entre distintas clases de vecindarios.

Para conseguir este propósito, se explorarán distintos métodos de clasificación no supervisada, empleándose finalmente el que ofrezca los resultados más apropiados. Los resultados se evaluarán en función de la homogeneidad espacial de los grupos, el sentido lógico del número de grupos, y la claridad de las diferencias estadísticas entre ellos.

Datos y fuentes

Los datos que emplearé para orientar la decisión del Sr. Alexopoulos serán:

- La lista de barrios de Los Ángeles. Todos los barrios están listados en la página de wikipedia
- La geolocalización de cada barrio. El "*centro geométrico*" de cada barrio/comunidad se obtendrá del paquete geocoder, que incluye información cartográfica de google, bing, OpenStreetMap y arcGIS.

La lista de lugares y sus categorías en cada barrio, proporcionada por la aplicación social FourSquare, a través de su API para desarrolladores. Este conjunto de datos permitirá definir la actividad económica que identifica a cada área geográfica.

Procedures and workflow

The work was organized in three stages.

In the stage 1, the data to carry out the analysis will be performed and organized. This involves the use of web crawling (from the Wikipedia source) for the neighborhoods, geolocation using various geographical information sources (bing, ArcGIS, and OpenStreetMap), and several calls to the FourSquare API. This stage also involved cleaning of the data.

Stage 2 involved cleaning of the data, and a fine assignation of each *place* category (in the FourSquare jargon the term *place* refers to any business, event, or public center) into more comprehensive categories. The categories for each *place* are all gathered in developer.foursquare.com/docs/categories. Many of the main categories were kept, while some new categories were created as follows:

- Arts and Entertainment
- Cultural (NEW)
- Business and Professional Services
- Community and Government
- Dining and Drinking
- Event
- Health and Medicine
- Landmarks and Outdoors
- Retail
- Basic provisions (NEW)
- Fashion and clothing (NEW)
- Sports and Recreation
- Travel and Transportation

During stage 3, various Machine Learning algorithms were tested for the neighborhood classification from the cleaned data, and both the most adequate method and the optimal number of clusters was determined. Later, the characteristics of each of the obtained clusters was analyzed in order of approaching the question to the principal answer. Finally, filtering of the results and the resulting data was visualized to provide the client with the desired information.

Plan de ejecución

El trabajo se organizó en tres etapas.

En la etapa 1, se realizarán y organizarán los datos para llevar a cabo el análisis. Para ello se utilizó el rastreo de la web (de Wikipedia) para los barrios, la geolocalización mediante varias fuentes de información geográfica (bing, ArcGIS y OpenStreetMap) y varias llamadas a la API de FourSquare. Esta etapa también implicó la limpieza de los datos.

La segunda fase consistió en la limpieza de los datos y en la asignación precisa de cada categoría de cada *place* (en FourSquare, el término *place* se refiere a cualquier negocio, evento o centro público) en categorías más amplias. Las categorías de cada lugar están reunidas en https://developer.foursquare.com/docs/categories. Se mantuvieron la mayoría de las categorías principales, mientras que se crearon algunas nuevas, quedando el listado final como sigue:

- Arte y entretenimiento
- Cultura (NEW)
- Servicios profesionales
- Sociedad y govierno
- Noche y bares
- Eventos
- Salud y medicina
- POIs y lugares al aire libre
- Tiendas (general)
- Tiendas de provisiones básicas (NEW)
- Tiendas de ropa y moda (NEW)
- Deportes y tiempo libre
- Viajes y transporte

Durante la etapa 3, se probaron varios algoritmos de Machine Learning para la clasificación de barrios a partir de los datos depurados, y se determinó tanto el método más adecuado como el número óptimo de *clusters*. Posteriormente, se caracterizó cada cluster de acuerdo a un análisis de sus características. Finalmente, se filtraron los resultados y se visualizaron los datos resultantes para proporcionar al cliente la información deseada.

Results

The metropolitan area of Los Angeles is composed of 220 neighborhoods according to the referenced Wikipedia page. It should be noted that this list includes “past” neighborhoods or communities that have been later integrated in larger ones. As a consequence, geocoding services do not provide locations for these neighborhoods, and they were removed from the dataset. A final number of 197 neighborhoods were considered in the study. Herein is the map with the geolocation of each neighborhood.

Resultados

El área metropolitana de Los Ángeles está compuesta por 220 barrios, según la página de Wikipedia referenciada. Hay que señalar que esta lista incluye barrios “pasados” o comunidades que se han integrado posteriormente en otras más grandes. En consecuencia, los servicios de geocodificación no proporcionan la ubicación de estos barrios, por lo que se eliminaron del conjunto de datos. En el estudio se consideró un número final de 197 barrios. A continuación se muestra el mapa con la geolocalización de cada barrio.

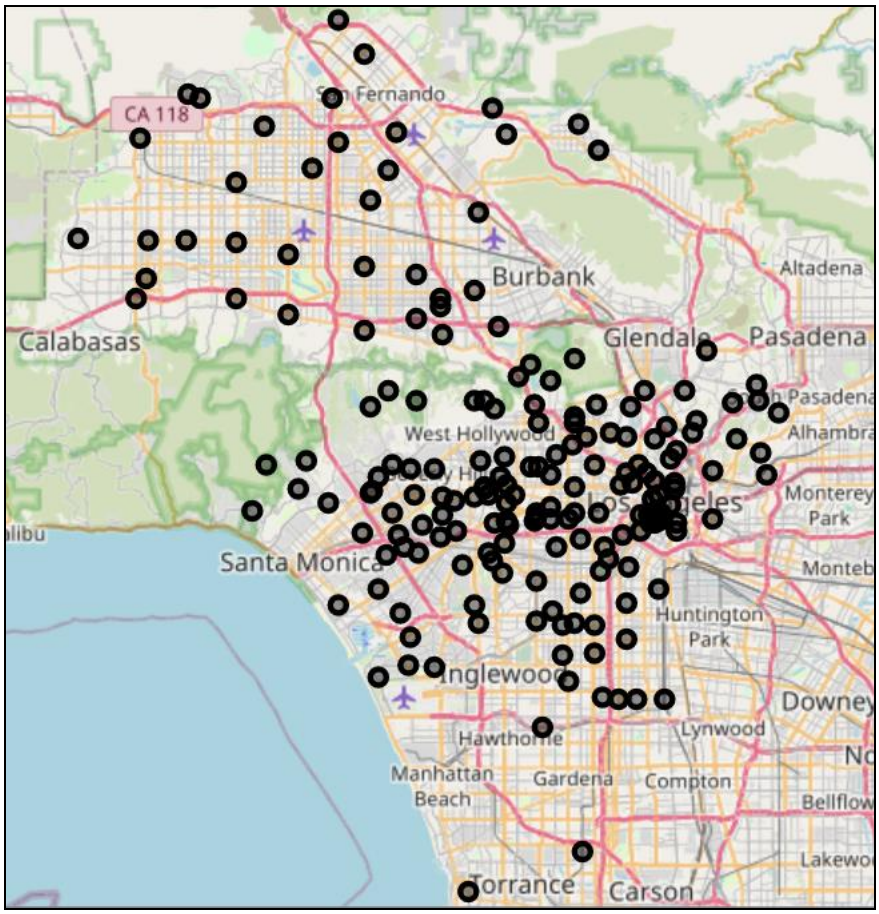

FIG 1 Location of the analyzed neighborhoods in Los Angeles (California) after web scraping from Wikipedia and geocoding with bing, ArcGIS, and OpenStreetMap

For the 197 neighborhoods, the 50 nearest *places* (setting a radius of 750 m from the circled

Para los 197 vecindarios, se solicitó la lista de los 50 *places* más cercanos en un radio de 750 m de

locations) where requested to the publicly available FourSquare application through its API.

A total of 9274 *places* was listed, each of which was uniquely associated to a single neighborhood by setting the distance to the origin location as the discriminating parameter, since some *places* were listed for more than one neighborhood simultaneously.

Due to the extension of the results, in Annex A, I present the results concerning the association of places to neighborhoods, the place category distribution, and the raw number of place categories associated to each neighborhood.

After obtaining the number of *places* for each neighborhood, the results are normalized so that only the proportion of each category of business/place remains. These results are gathered in Annex B. From these, we jump to the descriptive analysis phase, feeding them into unsupervised machine learning classification algorithms.

After testing DBSCAN without reaching results with an adequate number of clusters, I came to the conclusion that a density-based algorithm was not going to achieve any meaningful grouping considering the type of information we are reviewing. Next was K-means. Various values of the number of clusters from 2 to 6 were tested with the following results:

los círculos señalados a través de la API de la aplicación pública FourSquare.

Se listaron un total de 9274 *places*, cada uno de los cuales se asoció de forma única a un solo barrio, estableciendo la distancia a la ubicación de origen como parámetro discriminante, ya que algunos *places* se listaron para más de un barrio simultáneamente.

Debido a la extensión de los resultados, en el Anexo A, presento los resultados relativos a la asociación de lugares a los barrios, la distribución de categorías de lugares y el número bruto de categorías de lugares asociadas a cada barrio.

Después de obtener el número de *places* para cada vecindario, el resultado se normaliza de forma que para cada región geográfica sólo queda la proporción de negocios de cada categoría. Estos resultados están recogidos en el Anexo B. Partiendo de estos datos, pasamos a la fase de análisis descriptivo usando métodos de clasificación no supervisados.

Después de probar DBSCAN sin un resultado con un número adecuado de clústers, llegué a la conclusión de que un algoritmo basado en la densidad no iba a conseguir ninguna agrupación significativa teniendo en cuenta el tipo de información que estamos revisando. Lo siguiente fue la media K. Se probaron varios valores del número de clúster, de 2 a 6, con los siguientes resultados:

	N. kclusters	C.1	C.2	C.3	C.4	C.5	C.6	C.7
0	2	67	130	- -	- -	- -	- -	- -
1	3	75	85	37	- -	- -	- -	- -
2	4	83	68	13	33	- -	- -	- -
3	5	83	75	37	1	1	- -	- -
4	6	66	31	28	59	12	1	- -

TAB 1 Number of neighborhoods in each cluster using various cluster number in K-means method

Using 3, 4, and 6 clusters, clusters with a balanced number of components were obtained. On the other hand, with 5, in the current randomization example, there is a cluster with only one member. It was observed that the best consistency in the

Empleando 3, 4, y 6 clústers, se ottuvieron agrupaciones con un número de componentes equilibrado. Por su parte, con 5, en el ejemplo de aleatorización actual, existe un clúster con un solo miembro. Se observó que la mejor consistencia en

results by varying the randomization status was obtained with 4 clusters, and likewise happened with the geographic grouping. The referred results are presented:

los resultados variando el estado de aleatoriedad se obtiene con 4 clústers, y de igual manera sucede con la agrupación geográfica. Estos resultados se presentan a continuación:

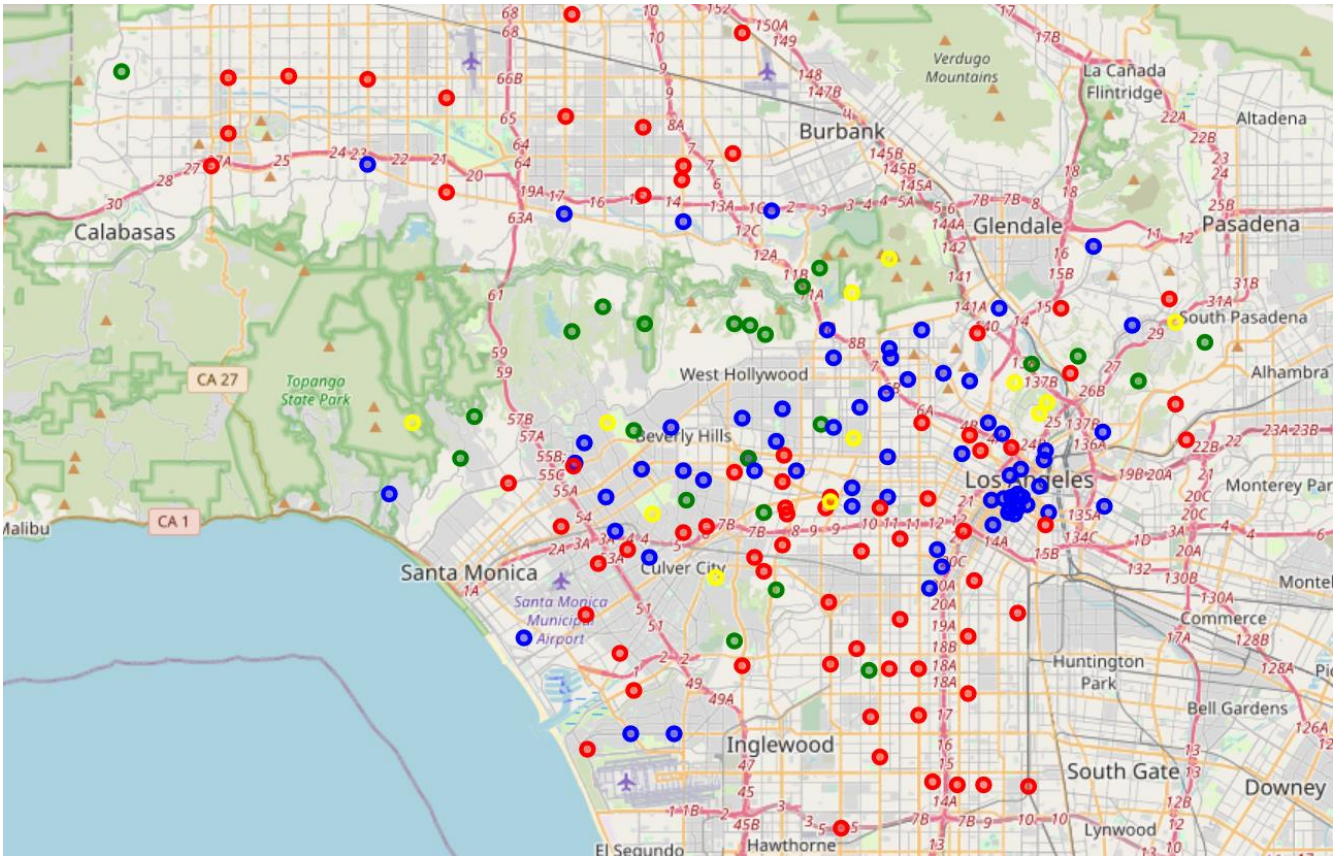

FIG 2 Cluster identification through color labelling, using K-means algorithm with 4 clusters

The determination of the characteristics of each cluster will be done through data visualization. According to Table Tab 3, the businesses with the highest incidence in Los Angeles are restaurant services, professional services, retail, health and beauty services, and basic retail. These 5 categories make up more than 80% of the businesses listed by FourSquare.

The incidence of the most recurrent categories for each of the four resulting clusters is shown graphically below.

La determinación de las características de cada clúster se realizará mediante visualización de datos. De acuerdo a la tabla Tab 3 los negocios de mayor incidencia en Los Ángeles son los servicios de restauración, los servicios profesionales, tiendas, servicios de salud y belleza, y tiendas de provisiones básicas. Estas 5 categorías conforman más del 80% de los negocios listados por FourSquare.

A continuación se muestra de forma gráfica la incidencia las categorías más recurrentes para cada uno de los clústers.

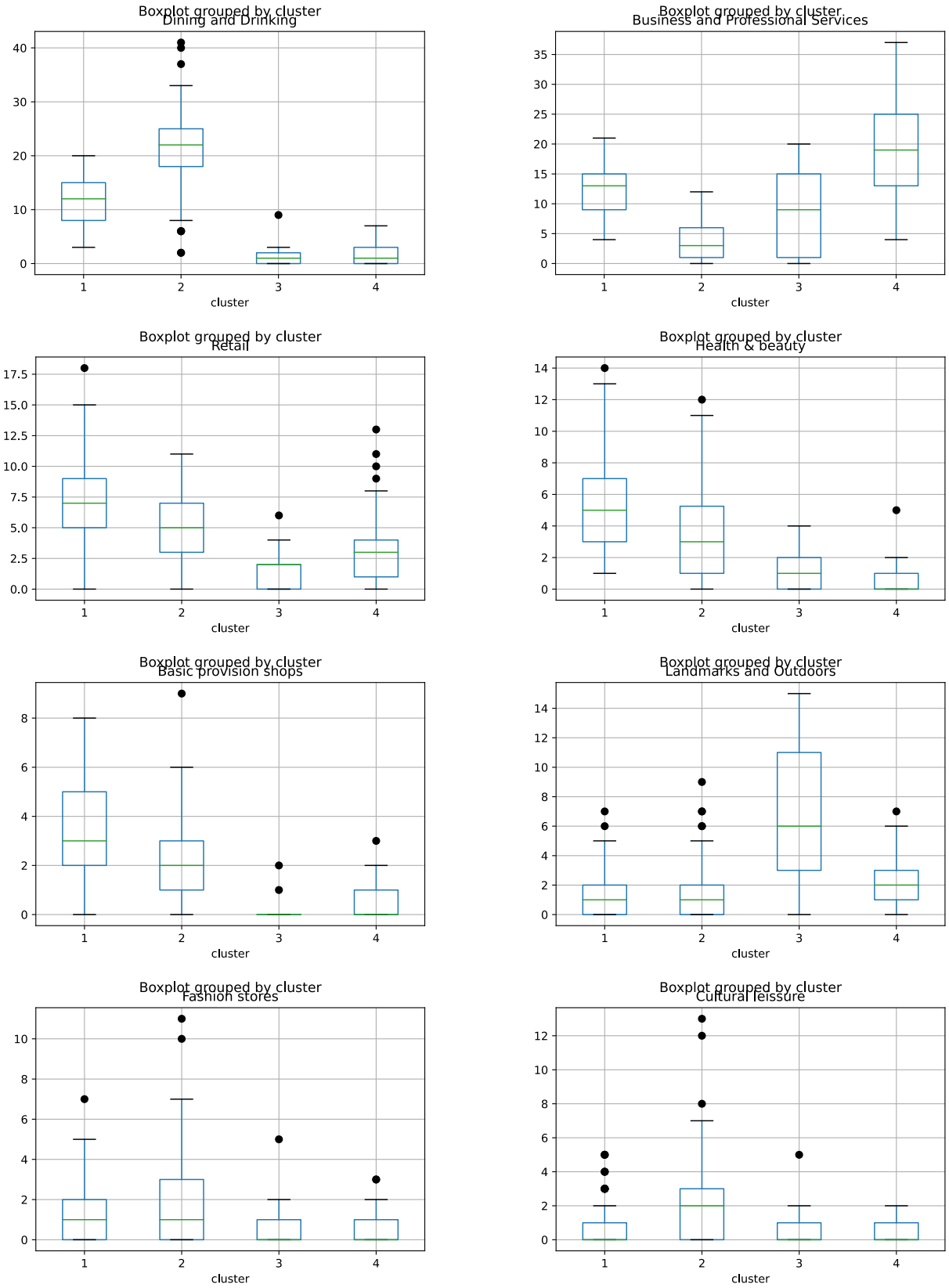

FIG 3 Boxplots for the most prevalent *place* categories in Los Angeles according to FourSquare data

Discussion

First, note that the total figure of *places* is quite close to 50×197, being the difference due to the subtraction of a mean of 7 *places* per neighborhood, being these 3 those that appeared listed simultaneously in various neighborhoods, due to their geographic closeness. The limit of places could be leading insufficiently accurate results, and thus this is a limitation of the current work.

The K-means classification algorithm with four clusters yields consistent results from different random seeds. Geographically, the four clusters are located in a coherent way, and their arrangement in the city structure (Fig 2) gives a glimpse of which classes of neighborhoods have been identified. Further analysis comes from the boxplots (Fig 3) of the most frequent categories of places in each neighborhood.

The first cluster (identified by the red color) shows a higher proportion of grocery stores and basic provisions, general stores, and health and beauty centers. It undoubtedly corresponds to primarily residential neighborhoods.

The second cluster (identified by the blue color), is characterized by its high occupancy of restaurants, stores of various kinds, including fashion, as well as having the highest proportion of cultural leisure centers. This cluster identifies neighborhoods whose activity is centered on tourism.

The third cluster (identified by the yellow color), stands out for its proportion of outdoor spaces.

Finally, cluster 4 (identified by the green color) has the highest proportion of professional services, which corresponds to neighborhoods dedicated to entrepreneurial businesses.

Discusión

Antes de comenzar, nótese que la cifra total de *places* es bastante cercana a 50×197, siendo la diferencia debida a la sustracción de una media de 7 *places* por barrio, siendo estos tres, los que aparecieron listados simultáneamente a varios vecindarios por su cercanía geográfica. El límite de plazas podría estar llevando a tener resultados insuficientes, por lo que debe resaltarse esta limitación en el trabajo actual.

El algoritmo de clasificación K-medias con cuatro clústers arroja unos resultados consistentes partiendo de diferentes semillas aleatorias. Geográficamente, los cuatro clústers se localizan de una forma coherente, y su disposición en la estructura de la ciudad (Fig 2) permite vislumbrar qué clases de vecindarios se han conseguido identificar. Un análisis más exhaustivo viene por los *boxplots* (Fig 3) de las categorías de places más frecuentes en cada vecindario.

El primer clúster (identificado con el color rojo) acusa una mayor proporción de locales de compras de víveres y provisiones básicas, tiendas en general, y centros de salud y belleza. Corresponde, sin lugar a dudas a vecindarios de dedicación principalmente residencial.

El segundo clúster (identificado por el color azul), se caracteriza por su alta ocupación de negocios de restauración, tiendas de diversa índole, incluída la moda, además de contar con la mayor proporción de centros de ocio cultural. Este clúster identifica a los vecindarios cuya actividad se centra en el turismo.

El tercer clúster (identificado por el color amarillo), destaca por su proporción de espacios al aire libre.

Para terminar, en el clúster 4 (identificado con el color verde) es en el que mayor proporción de servicios profesionales se prestan, lo que se corresponde con vecindarios dedicados a los negocios empresariales.

Conclusion

A petición del cliente, se ha hecho un estudio de Ciencia de Datos acerca de la dedicación de los distintos vecindarios en la ciudad de Los Ángeles. Se estudiaron más de 8000 establecimientos en 197 municipios, y mediante técnicas de agrupamiento mediante aprendizaje automático no supervisado se agruparon los vecindarios en 4 clústers.

Esta identificación por clústers permite, por una parte, identificar los barrios donde el negocio del cliente tendrá mayor potencial de éxito. A la vista de los resultados, se aconseja al cliente que opte por vecindarios identificados con el color azul. Además, se proporciona la identificación de aquellos vecindarios dedicados principalmente a uso residencial que colindan con los barrios turísticos, dada la preferencia del cliente por situarse en las cercanías de este tipo de áreas.

Conclusión

A petición del cliente, se ha hecho un estudio de Ciencia de Datos acerca de la dedicación de los distintos vecindarios en la ciudad de Los Ángeles. Se estudiaron más de 8000 establecimientos en 197 municipios, y mediante técnicas de agrupamiento mediante aprendizaje automático no supervisado se agruparon los vecindarios en 4 clústers.

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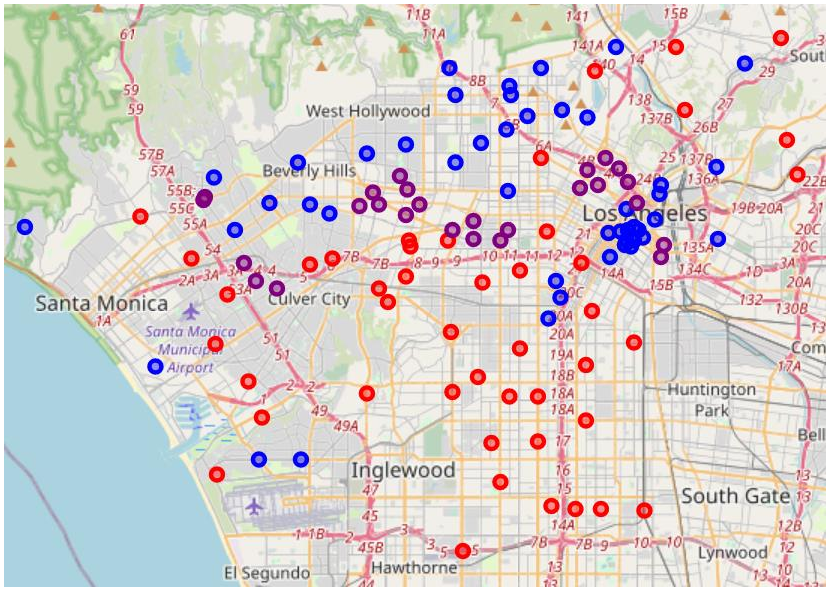

FIG 4 Final recommendation for the client; Legend: (Red) residential neighborhoods; (Blue) touristic neighborhoods; (Purple) either touristic neighborhood close (dist. <100 m) to residential neighborhood or residential neighborhood close to touristic neighborhood

Annex I
Raw data of *places*

Anexo I
Datos en crudo de *places*

Neighborhood	Total places	Arts and Entertainment	Cultural leisure	Business and Professional Services	Health & Beauty	Community and Government	Dining and Drinking	Event	Health and Medicine	Landmarks and Outdoors	Retail	Fashion stores	Basic provision shops	Sports and Recreation	Travels & Transportation
Adams-Normandie	46	1 (2%)	0 (0%)	12 (26%)	6 (13%)	0 (0%)	11 (24%)	0 (0%)	0 (0%)	4 (9%)	3 (7%)	1 (2%)	5 (11%)	3 (7%)	0 (0%)
Alsace	53	3 (6%)	0 (0%)	13 (25%)	7 (13%)	1 (2%)	11 (21%)	0 (0%)	2 (4%)	0 (0%)	10 (19%)	0 (0%)	5 (9%)	0 (0%)	1 (2%)
Angelino Heights	52	3 (6%)	3 (6%)	3 (6%)	3 (6%)	0 (0%)	22 (42%)	2 (4%)	0 (0%)	6 (12%)	3 (6%)	3 (6%)	2 (4%)	1 (2%)	1 (2%)
Angeles Mesa	49	1 (2%)	0 (0%)	13 (27%)	13 (27%)	3 (6%)	7 (14%)	0 (0%)	0 (0%)	2 (4%)	4 (8%)	0 (0%)	4 (8%)	2 (4%)	0 (0%)
Arleta	48	0 (0%)	0 (0%)	23 (48%)	5 (10%)	1 (2%)	5 (10%)	1 (2%)	0 (0%)	1 (2%)	10 (21%)	0 (0%)	1 (2%)	0 (0%)	1 (2%)
Arlington Heights	52	1 (2%)	4 (8%)	10 (19%)	5 (10%)	0 (0%)	21 (40%)	0 (0%)	0 (0%)	0 (0%)	8 (15%)	0 (0%)	3 (6%)	0 (0%)	0 (0%)
Arts District	54	3 (6%)	7 (13%)	5 (9%)	0 (0%)	0 (0%)	22 (41%)	0 (0%)	0 (0%)	3 (6%)	7 (13%)	4 (7%)	1 (2%)	2 (4%)	0 (0%)
Atwater Village	49	0 (0%)	2 (4%)	5 (10%)	4 (8%)	0 (0%)	25 (51%)	0 (0%)	0 (0%)	0 (0%)	8 (16%)	1 (2%)	4 (8%)	0 (0%)	0 (0%)
Baldwin Hills	47	3 (6%)	0 (0%)	15 (32%)	2 (4%)	0 (0%)	3 (6%)	0 (0%)	0 (0%)	11 (23%)	6 (13%)	1 (2%)	0 (0%)	6 (13%)	0 (0%)
Baldwin Hills/Crenshaw	47	0 (0%)	1 (2%)	25 (53%)	2 (4%)	6 (13%)	2 (4%)	1 (2%)	0 (0%)	4 (9%)	1 (2%)	2 (4%)	1 (2%)	0 (0%)	2 (4%)
Baldwin Village	51	0 (0%)	0 (0%)	11 (22%)	5 (10%)	0 (0%)	18 (35%)	0 (0%)	1 (2%)	2 (4%)	9 (18%)	1 (2%)	2 (4%)	1 (2%)	1 (2%)
Beachwood Canyon	43	1 (2%)	0 (0%)	17 (40%)	2 (5%)	2 (5%)	2 (5%)	0 (0%)	0 (0%)	11 (26%)	4 (9%)	2 (5%)	1 (2%)	0 (0%)	1 (2%)
Benedict Canyon	33	3 (9%)	2 (6%)	15 (45%)	0 (0%)	0 (0%)	3 (9%)	0 (0%)	1 (3%)	3 (9%)	3 (9%)	0 (0%)	0 (0%)	2 (6%)	1 (3%)
Beverly Crest	20	0 (0%)	0 (0%)	16 (80%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (10%)	0 (0%)	1 (5%)	0 (0%)	1 (5%)	0 (0%)
Beverly Glen	14	0 (0%)	0 (0%)	8 (57%)	0 (0%)	1 (7%)	1 (7%)	0 (0%)	1 (7%)	2 (14%)	1 (7%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Beverly Grove	50	1 (2%)	1 (2%)	1 (2%)	5 (10%)	0 (0%)	31 (62%)	0 (0%)	0 (0%)	0 (0%)	7 (14%)	4 (8%)	0 (0%)	0 (0%)	0 (0%)
Beverly Hills Post Office	50	1 (2%)	3 (6%)	2 (4%)	10 (20%)	0 (0%)	18 (36%)	0 (0%)	0 (0%)	3 (6%)	7 (14%)	3 (6%)	2 (4%)	1 (2%)	0 (0%)
Beverly Park	47	0 (0%)	4 (9%)	7 (15%)	3 (6%)	2 (4%)	16 (34%)	0 (0%)	0 (0%)	4 (9%)	7 (15%)	0 (0%)	3 (6%)	1 (2%)	0 (0%)
Beverlywood	45	1 (2%)	1 (2%)	29 (64%)	1 (2%)	2 (4%)	0 (0%)	0 (0%)	0 (0%)	2 (4%)	3 (7%)	1 (2%)	2 (4%)	1 (2%)	2 (4%)

Neighborhood	Total places	Arts and Entertainment	Cultural leisure	Business and Professional Services	Health & Beauty	Community and Government	Dining and Drinking	Event	Health and Medicine	Landmarks and Outdoors	Retail	Fashion stores	Basic provision shops	Sports and Recreation	Travels & Transportation
Boyle Heights	49	0 (0%)	1 (2%)	6 (12%)	5 (10%)	0 (0%)	25 (51%)	0 (0%)	0 (0%)	1 (2%)	3 (6%)	2 (4%)	6 (12%)	0 (0%)	0 (0%)
Brentwood	45	0 (0%)	0 (0%)	12 (27%)	9 (20%)	1 (2%)	8 (18%)	0 (0%)	0 (0%)	1 (2%)	5 (11%)	3 (7%)	3 (7%)	3 (7%)	0 (0%)
Broadway-Manchester	45	1 (2%)	0 (0%)	14 (31%)	6 (13%)	0 (0%)	6 (13%)	0 (0%)	1 (2%)	0 (0%)	6 (13%)	5 (11%)	4 (9%)	0 (0%)	2 (4%)
Brookside	49	0 (0%)	1 (2%)	14 (29%)	8 (16%)	1 (2%)	10 (20%)	0 (0%)	0 (0%)	7 (14%)	3 (6%)	1 (2%)	0 (0%)	4 (8%)	0 (0%)
Bunker Hill	52	2 (4%)	13 (25%)	1 (2%)	0 (0%)	0 (0%)	28 (54%)	0 (0%)	0 (0%)	2 (4%)	3 (6%)	0 (0%)	3 (6%)	0 (0%)	0 (0%)
Cahuenga Pass	44	1 (2%)	2 (5%)	27 (61%)	0 (0%)	1 (2%)	3 (7%)	0 (0%)	1 (2%)	1 (2%)	6 (14%)	0 (0%)	2 (5%)	0 (0%)	0 (0%)
Canoga Park	55	1 (2%)	0 (0%)	19 (35%)	4 (7%)	0 (0%)	10 (18%)	0 (0%)	0 (0%)	0 (0%)	15 (27%)	1 (2%)	5 (9%)	0 (0%)	0 (0%)
Carthay	50	0 (0%)	3 (6%)	9 (18%)	0 (0%)	0 (0%)	28 (56%)	0 (0%)	2 (4%)	1 (2%)	4 (8%)	0 (0%)	3 (6%)	0 (0%)	0 (0%)
Carthay Circle	5	0 (0%)	0 (0%)	4 (80%)	0 (0%)	1 (20%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Castle Heights	49	1 (2%)	0 (0%)	21 (43%)	6 (12%)	0 (0%)	8 (16%)	0 (0%)	0 (0%)	1 (2%)	4 (8%)	2 (4%)	4 (8%)	1 (2%)	1 (2%)
Central-Alameda	53	1 (2%)	0 (0%)	15 (28%)	3 (6%)	0 (0%)	14 (26%)	0 (0%)	0 (0%)	3 (6%)	8 (15%)	3 (6%)	5 (9%)	0 (0%)	1 (2%)
Central City	48	2 (4%)	1 (2%)	9 (19%)	3 (6%)	1 (2%)	14 (29%)	1 (2%)	0 (0%)	0 (0%)	9 (19%)	4 (8%)	4 (8%)	0 (0%)	0 (0%)
Century City	51	1 (2%)	2 (4%)	7 (14%)	2 (4%)	0 (0%)	22 (43%)	0 (0%)	0 (0%)	1 (2%)	6 (12%)	7 (14%)	3 (6%)	0 (0%)	0 (0%)
Chatsworth	56	0 (0%)	1 (2%)	8 (14%)	10 (18%)	2 (4%)	14 (25%)	1 (2%)	2 (4%)	1 (2%)	11 (20%)	1 (2%)	5 (9%)	0 (0%)	0 (0%)
Chesterfield Square	43	0 (0%)	0 (0%)	20 (47%)	0 (0%)	1 (2%)	7 (16%)	0 (0%)	0 (0%)	1 (2%)	11 (26%)	0 (0%)	2 (5%)	0 (0%)	1 (2%)
Cheviot Hills	43	4 (9%)	1 (2%)	15 (35%)	0 (0%)	1 (2%)	1 (2%)	0 (0%)	0 (0%)	6 (14%)	1 (2%)	0 (0%)	0 (0%)	14 (33%)	0 (0%)
Chinatown	51	2 (4%)	3 (6%)	2 (4%)	1 (2%)	1 (2%)	32 (63%)	0 (0%)	0 (0%)	1 (2%)	4 (8%)	4 (8%)	1 (2%)	0 (0%)	0 (0%)
Civic Center	17	0 (0%)	3 (18%)	1 (6%)	0 (0%)	0 (0%)	6 (35%)	0 (0%)	0 (0%)	4 (24%)	3 (18%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Country Club Park	33	1 (3%)	1 (3%)	2 (6%)	7 (21%)	0 (0%)	13 (39%)	0 (0%)	1 (3%)	4 (12%)	2 (6%)	0 (0%)	1 (3%)	1 (3%)	0 (0%)
Crenshaw	49	0 (0%)	0 (0%)	16 (33%)	4 (8%)	0 (0%)	15 (31%)	0 (0%)	0 (0%)	0 (0%)	9 (18%)	3 (6%)	2 (4%)	0 (0%)	0 (0%)
Crestview	29	0 (0%)	0 (0%)	16 (55%)	0 (0%)	1 (3%)	3 (10%)	0 (0%)	4 (14%)	0 (0%)	3 (10%)	0 (0%)	1 (3%)	0 (0%)	1 (3%)
Crestwood Hills	27	0 (0%)	1 (4%)	17 (63%)	0 (0%)	0 (0%)	1 (4%)	0 (0%)	0 (0%)	4 (15%)	1 (4%)	0 (0%)	0 (0%)	2 (7%)	1 (4%)
Cypress Park	49	0 (0%)	1 (2%)	16 (33%)	3 (6%)	2 (4%)	7 (14%)	0 (0%)	0 (0%)	4 (8%)	8 (16%)	0 (0%)	5 (10%)	3 (6%)	0 (0%)
Del Rey	51	0 (0%)	1 (2%)	10 (20%)	4 (8%)	0 (0%)	17 (33%)	0 (0%)	1 (2%)	1 (2%)	9 (18%)	0 (0%)	6 (12%)	2 (4%)	0 (0%)

Neighborhood	Total places	Arts and Entertainment	Cultural leisure	Business and Professional Services	Health & Beauty	Community and Government	Dining and Drinking	Event	Health and Medicine	Landmarks and Outdoors	Retail	Fashion stores	Basic provision shops	Sports and Recreation	Travels & Transportation
Downtown	54	2 (4%)	2 (4%)	2 (4%)	4 (7%)	0 (0%)	37 (69%)	0 (0%)	0 (0%)	0 (0%)	7 (13%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Eagle Rock	48	1 (2%)	2 (4%)	3 (6%)	4 (8%)	1 (2%)	21 (44%)	0 (0%)	0 (0%)	0 (0%)	5 (10%)	7 (15%)	4 (8%)	0 (0%)	0 (0%)
East Hollywood	51	1 (2%)	2 (4%)	7 (14%)	9 (18%)	0 (0%)	21 (41%)	0 (0%)	0 (0%)	0 (0%)	7 (14%)	0 (0%)	4 (8%)	0 (0%)	0 (0%)
Echo Park	46	0 (0%)	4 (9%)	0 (0%)	3 (7%)	2 (4%)	28 (61%)	0 (0%)	1 (2%)	4 (9%)	2 (4%)	0 (0%)	1 (2%)	0 (0%)	1 (2%)
Edendale	52	0 (0%)	1 (2%)	15 (29%)	6 (12%)	0 (0%)	15 (29%)	0 (0%)	0 (0%)	4 (8%)	7 (13%)	2 (4%)	2 (4%)	0 (0%)	0 (0%)
El Sereno	50	0 (0%)	0 (0%)	10 (20%)	10 (20%)	0 (0%)	11 (22%)	0 (0%)	0 (0%)	2 (4%)	11 (22%)	1 (2%)	5 (10%)	0 (0%)	0 (0%)
Elysian Heights	46	0 (0%)	1 (2%)	20 (43%)	1 (2%)	0 (0%)	3 (7%)	0 (0%)	0 (0%)	15 (33%)	4 (9%)	0 (0%)	0 (0%)	0 (0%)	2 (4%)
Elysian Park	49	15 (31%)	2 (4%)	4 (8%)	0 (0%)	0 (0%)	9 (18%)	0 (0%)	0 (0%)	6 (12%)	0 (0%)	1 (2%)	0 (0%)	12 (24%)	0 (0%)
Elysian Valley	47	2 (4%)	2 (4%)	23 (49%)	1 (2%)	0 (0%)	1 (2%)	0 (0%)	0 (0%)	7 (15%)	8 (17%)	3 (6%)	0 (0%)	0 (0%)	0 (0%)
Encino	49	0 (0%)	0 (0%)	15 (31%)	5 (10%)	1 (2%)	15 (31%)	0 (0%)	0 (0%)	3 (6%)	5 (10%)	2 (4%)	2 (4%)	1 (2%)	0 (0%)
Exposition Park	49	1 (2%)	12 (24%)	0 (0%)	0 (0%)	1 (2%)	15 (31%)	0 (0%)	0 (0%)	7 (14%)	8 (16%)	1 (2%)	0 (0%)	4 (8%)	0 (0%)
Fairfax	55	2 (4%)	3 (5%)	2 (4%)	5 (9%)	0 (0%)	23 (42%)	0 (0%)	2 (4%)	0 (0%)	10 (18%)	6 (11%)	2 (4%)	0 (0%)	0 (0%)
Fashion District	52	2 (4%)	6 (12%)	2 (4%)	1 (2%)	0 (0%)	25 (48%)	0 (0%)	0 (0%)	0 (0%)	5 (10%)	10 (19%)	1 (2%)	0 (0%)	0 (0%)
Financial District	51	0 (0%)	3 (6%)	1 (2%)	0 (0%)	0 (0%)	41 (80%)	0 (0%)	0 (0%)	1 (2%)	2 (4%)	1 (2%)	2 (4%)	0 (0%)	0 (0%)
Florence	48	1 (2%)	0 (0%)	13 (27%)	5 (10%)	2 (4%)	10 (21%)	0 (0%)	0 (0%)	1 (2%)	9 (19%)	0 (0%)	5 (10%)	1 (2%)	1 (2%)
Flower District	18	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	9 (50%)	0 (0%)	0 (0%)	0 (0%)	5 (28%)	3 (17%)	1 (6%)	0 (0%)	0 (0%)
Franklin Hills	9	0 (0%)	0 (0%)	6 (67%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (11%)	1 (11%)	0 (0%)	0 (0%)	1 (11%)	0 (0%)
Gallery Row	38	1 (3%)	3 (8%)	0 (0%)	1 (3%)	0 (0%)	26 (68%)	0 (0%)	1 (3%)	0 (0%)	3 (8%)	1 (3%)	1 (3%)	1 (3%)	0 (0%)
Garvanza	51	1 (2%)	3 (6%)	12 (24%)	7 (14%)	1 (2%)	12 (24%)	0 (0%)	0 (0%)	2 (4%)	6 (12%)	0 (0%)	5 (10%)	1 (2%)	1 (2%)
Glassell Park	50	0 (0%)	1 (2%)	12 (24%)	3 (6%)	3 (6%)	13 (26%)	0 (0%)	0 (0%)	4 (8%)	5 (10%)	1 (2%)	5 (10%)	3 (6%)	0 (0%)
Gramercy Park	47	0 (0%)	0 (0%)	14 (30%)	7 (15%)	3 (6%)	4 (9%)	0 (0%)	3 (6%)	3 (6%)	7 (15%)	2 (4%)	1 (2%)	3 (6%)	0 (0%)
Granada Hills	50	0 (0%)	0 (0%)	6 (12%)	14 (28%)	3 (6%)	14 (28%)	0 (0%)	2 (4%)	1 (2%)	6 (12%)	0 (0%)	2 (4%)	2 (4%)	0 (0%)
Green Meadows	44	0 (0%)	0 (0%)	16 (36%)	4 (9%)	0 (0%)	13 (30%)	0 (0%)	0 (0%)	1 (2%)	2 (5%)	0 (0%)	8 (18%)	0 (0%)	0 (0%)
Griffith Park	9	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	9 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Neighborhood	Total places	Arts and Entertainment	Cultural leisure	Business and Professional Services	Health & Beauty	Community and Government	Dining and Drinking	Event	Health and Medicine	Landmarks and Outdoors	Retail	Fashion stores	Basic provision shops	Sports and Recreation	Travels & Transportation
Hancock Park	45	0 (0%)	0 (0%)	34 (76%)	0 (0%)	3 (7%)	1 (2%)	0 (0%)	0 (0%)	1 (2%)	1 (2%)	2 (4%)	1 (2%)	0 (0%)	2 (4%)
Harbor City	54	1 (2%)	0 (0%)	15 (28%)	3 (6%)	0 (0%)	18 (33%)	0 (0%)	0 (0%)	0 (0%)	12 (22%)	0 (0%)	4 (7%)	1 (2%)	0 (0%)
Harbor Gateway	52	2 (4%)	0 (0%)	14 (27%)	4 (8%)	0 (0%)	15 (29%)	0 (0%)	1 (2%)	0 (0%)	12 (23%)	2 (4%)	1 (2%)	0 (0%)	1 (2%)
Harvard Heights	55	0 (0%)	0 (0%)	9 (16%)	5 (9%)	0 (0%)	26 (47%)	0 (0%)	2 (4%)	0 (0%)	6 (11%)	2 (4%)	4 (7%)	0 (0%)	1 (2%)
Harvard Park	40	0 (0%)	0 (0%)	15 (38%)	4 (10%)	1 (3%)	5 (13%)	0 (0%)	0 (0%)	3 (8%)	5 (13%)	1 (3%)	5 (13%)	1 (3%)	0 (0%)
Hermon	37	0 (0%)	5 (14%)	10 (27%)	3 (8%)	1 (3%)	2 (5%)	0 (0%)	3 (8%)	7 (19%)	2 (5%)	1 (3%)	2 (5%)	1 (3%)	0 (0%)
Highland Park	51	1 (2%)	4 (8%)	4 (8%)	6 (12%)	2 (4%)	22 (43%)	0 (0%)	0 (0%)	0 (0%)	7 (14%)	2 (4%)	3 (6%)	0 (0%)	0 (0%)
Historic Filipinotown	47	1 (2%)	2 (4%)	9 (19%)	3 (6%)	3 (6%)	15 (32%)	0 (0%)	1 (2%)	2 (4%)	7 (15%)	0 (0%)	3 (6%)	1 (2%)	0 (0%)
Historic Core	11	0 (0%)	2 (18%)	0 (0%)	0 (0%)	0 (0%)	8 (73%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (9%)	0 (0%)	0 (0%)	0 (0%)
Hollywood	55	3 (5%)	6 (11%)	0 (0%)	3 (5%)	1 (2%)	33 (60%)	0 (0%)	0 (0%)	1 (2%)	3 (5%)	2 (4%)	3 (5%)	0 (0%)	0 (0%)
Hollywood Hills	24	1 (4%)	0 (0%)	11 (46%)	0 (0%)	2 (8%)	1 (4%)	0 (0%)	0 (0%)	5 (21%)	3 (13%)	0 (0%)	1 (4%)	0 (0%)	0 (0%)
Hollywood Hills West	44	0 (0%)	1 (2%)	27 (61%)	2 (5%)	2 (5%)	3 (7%)	0 (0%)	0 (0%)	2 (5%)	4 (9%)	1 (2%)	2 (5%)	0 (0%)	0 (0%)
Holmby Hills	23	1 (4%)	0 (0%)	9 (39%)	0 (0%)	3 (13%)	2 (9%)	0 (0%)	0 (0%)	4 (17%)	2 (9%)	0 (0%)	0 (0%)	2 (9%)	0 (0%)
Hyde Park	50	0 (0%)	0 (0%)	12 (24%)	5 (10%)	1 (2%)	16 (32%)	0 (0%)	0 (0%)	0 (0%)	6 (12%)	5 (10%)	5 (10%)	0 (0%)	0 (0%)
Jefferson Park	48	1 (2%)	0 (0%)	14 (29%)	6 (13%)	3 (6%)	8 (17%)	0 (0%)	0 (0%)	1 (2%)	9 (19%)	0 (0%)	4 (8%)	2 (4%)	0 (0%)
Jewelry District	12	0 (0%)	1 (8%)	0 (0%)	1 (8%)	0 (0%)	6 (50%)	0 (0%)	0 (0%)	1 (8%)	2 (17%)	0 (0%)	1 (8%)	0 (0%)	0 (0%)
Koreatown	50	0 (0%)	1 (2%)	1 (2%)	1 (2%)	0 (0%)	40 (80%)	0 (0%)	0 (0%)	1 (2%)	2 (4%)	1 (2%)	2 (4%)	1 (2%)	0 (0%)
La Cienega Heights	48	0 (0%)	0 (0%)	14 (29%)	7 (15%)	1 (2%)	13 (27%)	0 (0%)	0 (0%)	1 (2%)	8 (17%)	3 (6%)	1 (2%)	0 (0%)	0 (0%)
Ladera	31	0 (0%)	0 (0%)	18 (58%)	0 (0%)	3 (10%)	1 (3%)	0 (0%)	1 (3%)	3 (10%)	2 (6%)	1 (3%)	0 (0%)	0 (0%)	2 (6%)
Lafayette Square	45	0 (0%)	0 (0%)	8 (18%)	6 (13%)	0 (0%)	11 (24%)	0 (0%)	0 (0%)	1 (2%)	9 (20%)	4 (9%)	5 (11%)	1 (2%)	0 (0%)
Lake Balboa	49	0 (0%)	0 (0%)	10 (20%)	7 (14%)	1 (2%)	16 (33%)	0 (0%)	2 (4%)	1 (2%)	7 (14%)	0 (0%)	3 (6%)	2 (4%)	0 (0%)
Lake View Terrace	20	1 (5%)	0 (0%)	13 (65%)	0 (0%)	1 (5%)	0 (0%)	0 (0%)	0 (0%)	1 (5%)	3 (15%)	0 (0%)	0 (0%)	1 (5%)	0 (0%)
Larchmont	50	4 (8%)	3 (6%)	8 (16%)	7 (14%)	0 (0%)	21 (42%)	0 (0%)	0 (0%)	4 (8%)	1 (2%)	1 (2%)	1 (2%)	0 (0%)	0 (0%)
Laurel Canyon	52	1 (2%)	4 (8%)	14 (27%)	7 (13%)	1 (2%)	15 (29%)	0 (0%)	0 (0%)	0 (0%)	7 (13%)	1 (2%)	1 (2%)	1 (2%)	0 (0%)

Neighborhood	Total places	Arts and Entertainment	Cultural leisure	Business and Professional Services	Health & Beauty	Community and Government	Dining and Drinking	Event	Health and Medicine	Landmarks and Outdoors	Retail	Fashion stores	Basic provision shops	Sports and Recreation	Travels & Transportation
Leimert Park	51	1 (2%)	4 (8%)	6 (12%)	10 (20%)	1 (2%)	16 (31%)	0 (0%)	0 (0%)	1 (2%)	5 (10%)	3 (6%)	4 (8%)	0 (0%)	0 (0%)
Lincoln Heights	49	0 (0%)	0 (0%)	4 (8%)	6 (12%)	1 (2%)	20 (41%)	0 (0%)	0 (0%)	0 (0%)	11 (22%)	1 (2%)	5 (10%)	1 (2%)	0 (0%)
Little Armenia	50	0 (0%)	0 (0%)	7 (14%)	8 (16%)	0 (0%)	24 (48%)	0 (0%)	1 (2%)	1 (2%)	6 (12%)	0 (0%)	3 (6%)	0 (0%)	0 (0%)
Little Ethiopia	40	0 (0%)	3 (8%)	1 (3%)	1 (3%)	2 (5%)	19 (48%)	0 (0%)	0 (0%)	2 (5%)	7 (18%)	1 (3%)	1 (3%)	3 (8%)	0 (0%)
Little Italy	47	1 (2%)	0 (0%)	12 (26%)	3 (6%)	2 (4%)	22 (47%)	0 (0%)	0 (0%)	0 (0%)	3 (6%)	0 (0%)	4 (9%)	0 (0%)	0 (0%)
Little Tokyo	51	1 (2%)	3 (6%)	2 (4%)	0 (0%)	0 (0%)	29 (57%)	0 (0%)	0 (0%)	0 (0%)	10 (20%)	4 (8%)	2 (4%)	0 (0%)	0 (0%)
Los Feliz	51	1 (2%)	1 (2%)	2 (4%)	2 (4%)	1 (2%)	29 (57%)	0 (0%)	1 (2%)	0 (0%)	7 (14%)	1 (2%)	6 (12%)	0 (0%)	0 (0%)
Manchester Square	47	0 (0%)	0 (0%)	11 (23%)	12 (26%)	2 (4%)	10 (21%)	0 (0%)	0 (0%)	0 (0%)	7 (15%)	0 (0%)	4 (9%)	0 (0%)	1 (2%)
Mandeville Canyon	19	0 (0%)	0 (0%)	13 (68%)	0 (0%)	1 (5%)	0 (0%)	0 (0%)	0 (0%)	3 (16%)	1 (5%)	0 (0%)	0 (0%)	1 (5%)	0 (0%)
Marina Peninsula	57	2 (4%)	0 (0%)	33 (58%)	0 (0%)	1 (2%)	6 (11%)	0 (0%)	0 (0%)	2 (4%)	13 (23%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Mar Vista	52	0 (0%)	3 (6%)	11 (21%)	4 (8%)	1 (2%)	15 (29%)	1 (2%)	0 (0%)	0 (0%)	11 (21%)	3 (6%)	3 (6%)	0 (0%)	0 (0%)
Melrose Hill	49	1 (2%)	1 (2%)	7 (14%)	2 (4%)	1 (2%)	20 (41%)	0 (0%)	0 (0%)	0 (0%)	6 (12%)	0 (0%)	9 (18%)	2 (4%)	0 (0%)
Mid-City	44	1 (2%)	2 (5%)	22 (50%)	2 (5%)	1 (2%)	3 (7%)	0 (0%)	0 (0%)	0 (0%)	9 (20%)	0 (0%)	3 (7%)	0 (0%)	1 (2%)
Mid-City Heights	22	0 (0%)	0 (0%)	14 (64%)	0 (0%)	0 (0%)	1 (5%)	0 (0%)	0 (0%)	0 (0%)	4 (18%)	3 (14%)	0 (0%)	0 (0%)	0 (0%)
Mid-City West	15	0 (0%)	1 (7%)	4 (27%)	3 (20%)	0 (0%)	3 (20%)	0 (0%)	0 (0%)	1 (7%)	1 (7%)	0 (0%)	2 (13%)	0 (0%)	0 (0%)
Mid-Wilshire	51	3 (6%)	3 (6%)	6 (12%)	5 (10%)	2 (4%)	20 (39%)	0 (0%)	0 (0%)	1 (2%)	8 (16%)	0 (0%)	2 (4%)	1 (2%)	0 (0%)
Miracle Mile	48	3 (6%)	5 (10%)	10 (21%)	3 (6%)	1 (2%)	11 (23%)	0 (0%)	1 (2%)	4 (8%)	4 (8%)	1 (2%)	4 (8%)	1 (2%)	0 (0%)
Mission Hills	51	0 (0%)	0 (0%)	14 (27%)	3 (6%)	0 (0%)	17 (33%)	0 (0%)	1 (2%)	0 (0%)	12 (24%)	2 (4%)	2 (4%)	0 (0%)	0 (0%)
Montecito Heights	38	0 (0%)	0 (0%)	20 (53%)	1 (3%)	0 (0%)	5 (13%)	0 (0%)	0 (0%)	6 (16%)	2 (5%)	1 (3%)	0 (0%)	3 (8%)	0 (0%)
Monterey Hills	18	1 (6%)	0 (0%)	13 (72%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (11%)	1 (6%)	1 (6%)	0 (0%)	0 (0%)	0 (0%)
Mount Olympus	26	1 (4%)	0 (0%)	19 (73%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (4%)	2 (8%)	3 (12%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Mount Washington	36	0 (0%)	0 (0%)	25 (69%)	1 (3%)	1 (3%)	0 (0%)	0 (0%)	0 (0%)	5 (14%)	1 (3%)	1 (3%)	2 (6%)	0 (0%)	0 (0%)
Naud Junction	37	0 (0%)	0 (0%)	1 (3%)	2 (5%)	0 (0%)	28 (76%)	0 (0%)	0 (0%)	2 (5%)	2 (5%)	2 (5%)	0 (0%)	0 (0%)	0 (0%)
Nichols Canyon	38	0 (0%)	1 (3%)	23 (61%)	1 (3%)	0 (0%)	1 (3%)	0 (0%)	0 (0%)	6 (16%)	3 (8%)	1 (3%)	0 (0%)	1 (3%)	1 (3%)

Neighborhood	Total places	Arts and Entertainment	Cultural leisure	Business and Professional Services	Health & Beauty	Community and Government	Dining and Drinking	Event	Health and Medicine	Landmarks and Outdoors	Retail	Fashion stores	Basic provision shops	Sports and Recreation	Travels & Transportation
North Hills	35	0 (0%)	0 (0%)	25 (71%)	1 (3%)	2 (6%)	0 (0%)	0 (0%)	0 (0%)	2 (6%)	3 (9%)	0 (0%)	0 (0%)	2 (6%)	0 (0%)
North Hollywood	54	1 (2%)	2 (4%)	18 (33%)	3 (6%)	0 (0%)	16 (30%)	0 (0%)	0 (0%)	0 (0%)	12 (22%)	0 (0%)	2 (4%)	0 (0%)	0 (0%)
Northridge	52	1 (2%)	0 (0%)	6 (12%)	12 (23%)	0 (0%)	25 (48%)	0 (0%)	0 (0%)	0 (0%)	6 (12%)	1 (2%)	1 (2%)	0 (0%)	0 (0%)
North University Park	47	1 (2%)	0 (0%)	3 (6%)	1 (2%)	2 (4%)	22 (47%)	0 (0%)	1 (2%)	4 (9%)	6 (13%)	0 (0%)	6 (13%)	0 (0%)	1 (2%)
Oakwood	22	0 (0%)	0 (0%)	13 (59%)	0 (0%)	0 (0%)	1 (5%)	0 (0%)	1 (5%)	1 (5%)	4 (18%)	0 (0%)	1 (5%)	0 (0%)	1 (5%)
Pacific Palisades	50	0 (0%)	1 (2%)	5 (10%)	5 (10%)	0 (0%)	20 (40%)	0 (0%)	0 (0%)	1 (2%)	7 (14%)	7 (14%)	3 (6%)	0 (0%)	1 (2%)
Pacoima	48	1 (2%)	1 (2%)	17 (35%)	7 (15%)	0 (0%)	13 (27%)	0 (0%)	1 (2%)	0 (0%)	4 (8%)	0 (0%)	3 (6%)	0 (0%)	1 (2%)
Palms	52	2 (4%)	0 (0%)	6 (12%)	11 (21%)	0 (0%)	22 (42%)	0 (0%)	0 (0%)	0 (0%)	6 (12%)	0 (0%)	3 (6%)	2 (4%)	0 (0%)
Panorama City	51	0 (0%)	0 (0%)	8 (16%)	7 (14%)	0 (0%)	18 (35%)	0 (0%)	2 (4%)	0 (0%)	5 (10%)	7 (14%)	2 (4%)	1 (2%)	1 (2%)
Park La Brea	45	2 (4%)	8 (18%)	1 (2%)	0 (0%)	0 (0%)	12 (27%)	0 (0%)	0 (0%)	4 (9%)	9 (20%)	6 (13%)	3 (7%)	0 (0%)	0 (0%)
Pico-Robertson	50	2 (4%)	0 (0%)	6 (12%)	8 (16%)	3 (6%)	19 (38%)	0 (0%)	0 (0%)	0 (0%)	7 (14%)	3 (6%)	2 (4%)	0 (0%)	0 (0%)
Pico-Union	54	0 (0%)	0 (0%)	8 (15%)	7 (13%)	0 (0%)	20 (37%)	0 (0%)	1 (2%)	0 (0%)	12 (22%)	0 (0%)	6 (11%)	0 (0%)	0 (0%)
Playa del Rey	48	0 (0%)	0 (0%)	16 (33%)	4 (8%)	2 (4%)	8 (17%)	0 (0%)	1 (2%)	6 (13%)	5 (10%)	2 (4%)	1 (2%)	3 (6%)	0 (0%)
Playa Vista	49	0 (0%)	1 (2%)	9 (18%)	6 (12%)	0 (0%)	14 (29%)	0 (0%)	1 (2%)	5 (10%)	6 (12%)	1 (2%)	3 (6%)	1 (2%)	2 (4%)
Porter Ranch	44	0 (0%)	0 (0%)	12 (27%)	2 (5%)	2 (5%)	3 (7%)	0 (0%)	0 (0%)	4 (9%)	11 (25%)	5 (11%)	5 (11%)	0 (0%)	0 (0%)
Rancho Park	51	1 (2%)	0 (0%)	7 (14%)	3 (6%)	1 (2%)	18 (35%)	0 (0%)	1 (2%)	2 (4%)	11 (22%)	6 (12%)	1 (2%)	0 (0%)	0 (0%)
Reseda	49	1 (2%)	1 (2%)	9 (18%)	6 (12%)	0 (0%)	14 (29%)	0 (0%)	0 (0%)	0 (0%)	13 (27%)	2 (4%)	2 (4%)	1 (2%)	0 (0%)
Reynier Village	47	1 (2%)	2 (4%)	8 (17%)	5 (11%)	0 (0%)	13 (28%)	0 (0%)	1 (2%)	1 (2%)	10 (21%)	2 (4%)	3 (6%)	1 (2%)	0 (0%)
Rose Hills	2	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Rustic Canyon	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Pedro	50	0 (0%)	0 (0%)	10 (20%)	8 (16%)	1 (2%)	23 (46%)	0 (0%)	1 (2%)	2 (4%)	2 (4%)	1 (2%)	2 (4%)	0 (0%)	0 (0%)
Sawtelle	52	2 (4%)	3 (6%)	12 (23%)	2 (4%)	0 (0%)	13 (25%)	0 (0%)	1 (2%)	2 (4%)	12 (23%)	0 (0%)	4 (8%)	1 (2%)	0 (0%)
Shadow Hills	26	0 (0%)	0 (0%)	15 (58%)	0 (0%)	1 (4%)	0 (0%)	0 (0%)	0 (0%)	2 (8%)	5 (19%)	0 (0%)	0 (0%)	2 (8%)	1 (4%)
Sherman Oaks	50	1 (2%)	0 (0%)	2 (4%)	7 (14%)	0 (0%)	29 (58%)	0 (0%)	0 (0%)	0 (0%)	6 (12%)	3 (6%)	2 (4%)	0 (0%)	0 (0%)

Neighborhood	Total places	Arts and Entertainment	Cultural leisure	Business and Professional Services	Health & Beauty	Community and Government	Dining and Drinking	Event	Health and Medicine	Landmarks and Outdoors	Retail	Fashion stores	Basic provision shops	Sports and Recreation	Travels & Transportation
Sherman Village	48	2 (4%)	0 (0%)	15 (31%)	6 (13%)	1 (2%)	9 (19%)	0 (0%)	3 (6%)	1 (2%)	7 (15%)	1 (2%)	2 (4%)	1 (2%)	0 (0%)
Silver Lake	50	0 (0%)	0 (0%)	5 (10%)	8 (16%)	0 (0%)	16 (32%)	0 (0%)	0 (0%)	7 (14%)	6 (12%)	5 (10%)	0 (0%)	3 (6%)	0 (0%)
Skid Row	21	1 (5%)	0 (0%)	0 (0%)	1 (5%)	1 (5%)	16 (76%)	0 (0%)	0 (0%)	0 (0%)	1 (5%)	0 (0%)	1 (5%)	0 (0%)	0 (0%)
Solano Canyon	36	0 (0%)	2 (6%)	10 (28%)	1 (3%)	2 (6%)	0 (0%)	0 (0%)	0 (0%)	13 (36%)	2 (6%)	1 (3%)	0 (0%)	4 (11%)	1 (3%)
Sonoratown	13	0 (0%)	2 (15%)	0 (0%)	1 (8%)	0 (0%)	6 (46%)	0 (0%)	0 (0%)	0 (0%)	1 (8%)	2 (15%)	1 (8%)	0 (0%)	0 (0%)
South Central; Historic	50	2 (4%)	3 (6%)	7 (14%)	5 (10%)	2 (4%)	10 (20%)	0 (0%)	0 (0%)	1 (2%)	18 (36%)	1 (2%)	0 (0%)	0 (0%)	1 (2%)
South Carthay	51	1 (2%)	1 (2%)	11 (22%)	7 (14%)	0 (0%)	15 (29%)	1 (2%)	1 (2%)	1 (2%)	8 (16%)	2 (4%)	0 (0%)	2 (4%)	1 (2%)
South Park	53	0 (0%)	0 (0%)	21 (40%)	4 (8%)	4 (8%)	6 (11%)	1 (2%)	0 (0%)	4 (8%)	4 (8%)	0 (0%)	7 (13%)	2 (4%)	0 (0%)
South Robertson	52	2 (4%)	3 (6%)	6 (12%)	7 (13%)	2 (4%)	20 (38%)	0 (0%)	1 (2%)	0 (0%)	5 (10%)	3 (6%)	2 (4%)	0 (0%)	1 (2%)
Studio City	50	0 (0%)	0 (0%)	5 (10%)	5 (10%)	1 (2%)	21 (42%)	0 (0%)	0 (0%)	5 (10%)	5 (10%)	2 (4%)	4 (8%)	2 (4%)	0 (0%)
Sunland	44	1 (2%)	0 (0%)	32 (73%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (2%)	3 (7%)	3 (7%)	2 (5%)	0 (0%)	1 (2%)	1 (2%)
Sunset Junction	52	1 (2%)	2 (4%)	7 (13%)	1 (2%)	0 (0%)	21 (40%)	0 (0%)	0 (0%)	0 (0%)	11 (21%)	6 (12%)	3 (6%)	0 (0%)	0 (0%)
Sun Valley	51	1 (2%)	0 (0%)	9 (18%)	7 (14%)	1 (2%)	19 (37%)	0 (0%)	0 (0%)	2 (4%)	7 (14%)	0 (0%)	2 (4%)	0 (0%)	3 (6%)
Sylmar	45	1 (2%)	0 (0%)	15 (33%)	4 (9%)	2 (4%)	12 (27%)	0 (0%)	0 (0%)	2 (4%)	5 (11%)	0 (0%)	2 (4%)	1 (2%)	1 (2%)
Tarzana	52	0 (0%)	0 (0%)	6 (12%)	5 (10%)	0 (0%)	23 (44%)	0 (0%)	0 (0%)	0 (0%)	11 (21%)	3 (6%)	4 (8%)	0 (0%)	0 (0%)
Terminal Island	7	0 (0%)	0 (0%)	4 (57%)	0 (0%)	1 (14%)	1 (14%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (14%)	0 (0%)	0 (0%)
Thai Town	32	1 (3%)	1 (3%)	0 (0%)	5 (16%)	0 (0%)	13 (41%)	0 (0%)	1 (3%)	0 (0%)	4 (13%)	1 (3%)	5 (16%)	0 (0%)	1 (3%)
Toluca Lake	50	0 (0%)	0 (0%)	8 (16%)	7 (14%)	0 (0%)	22 (44%)	0 (0%)	0 (0%)	2 (4%)	4 (8%)	2 (4%)	4 (8%)	1 (2%)	0 (0%)
Toy District	5	1 (20%)	2 (40%)	0 (0%)	0 (0%)	0 (0%)	2 (40%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Tujunga	45	0 (0%)	1 (2%)	15 (33%)	6 (13%)	2 (4%)	8 (18%)	0 (0%)	0 (0%)	1 (2%)	6 (13%)	1 (2%)	4 (9%)	1 (2%)	0 (0%)
University Hills	48	3 (6%)	5 (10%)	19 (40%)	2 (4%)	0 (0%)	10 (21%)	0 (0%)	0 (0%)	0 (0%)	4 (8%)	1 (2%)	4 (8%)	0 (0%)	0 (0%)
University Park	37	0 (0%)	1 (3%)	2 (5%)	5 (14%)	3 (8%)	16 (43%)	0 (0%)	0 (0%)	6 (16%)	4 (11%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
University Park; North	51	2 (4%)	3 (6%)	13 (25%)	8 (16%)	0 (0%)	10 (20%)	0 (0%)	0 (0%)	2 (4%)	7 (14%)	1 (2%)	2 (4%)	2 (4%)	1 (2%)
Valley Glen	51	0 (0%)	1 (2%)	12 (24%)	6 (12%)	1 (2%)	18 (35%)	1 (2%)	0 (0%)	2 (4%)	8 (16%)	1 (2%)	0 (0%)	1 (2%)	0 (0%)

Neighborhood	Total places	Arts and Entertainment	Cultural leisure	Business and Professional Services	Health & Beauty	Community and Government	Dining and Drinking	Event	Health and Medicine	Landmarks and Outdoors	Retail	Fashion stores	Basic provision shops	Sports and Recreation	Travels & Transportation
Valley Village	32	1 (3%)	0 (0%)	5 (16%)	8 (25%)	0 (0%)	3 (9%)	0 (0%)	0 (0%)	0 (0%)	6 (19%)	4 (13%)	5 (16%)	0 (0%)	0 (0%)
Van Nuys	53	3 (6%)	0 (0%)	7 (13%)	7 (13%)	0 (0%)	18 (34%)	1 (2%)	1 (2%)	0 (0%)	12 (23%)	1 (2%)	1 (2%)	2 (4%)	0 (0%)
Venice	50	1 (2%)	1 (2%)	0 (0%)	3 (6%)	0 (0%)	22 (44%)	0 (0%)	0 (0%)	1 (2%)	10 (20%)	11 (22%)	1 (2%)	0 (0%)	0 (0%)
Vermont Knolls	48	0 (0%)	0 (0%)	15 (31%)	6 (13%)	7 (15%)	4 (8%)	0 (0%)	3 (6%)	0 (0%)	7 (15%)	0 (0%)	3 (6%)	0 (0%)	3 (6%)
Vermont-Slauson	49	0 (0%)	0 (0%)	16 (33%)	7 (14%)	1 (2%)	10 (20%)	1 (2%)	0 (0%)	1 (2%)	6 (12%)	4 (8%)	3 (6%)	0 (0%)	0 (0%)
Vermont Square	51	0 (0%)	0 (0%)	18 (35%)	4 (8%)	3 (6%)	4 (8%)	1 (2%)	0 (0%)	1 (2%)	9 (18%)	2 (4%)	6 (12%)	3 (6%)	0 (0%)
Vermont Vista	48	0 (0%)	0 (0%)	15 (31%)	6 (13%)	2 (4%)	5 (10%)	0 (0%)	1 (2%)	0 (0%)	11 (23%)	1 (2%)	6 (13%)	0 (0%)	1 (2%)
Victor Heights	33	0 (0%)	1 (3%)	13 (39%)	1 (3%)	0 (0%)	5 (15%)	0 (0%)	0 (0%)	2 (6%)	7 (21%)	0 (0%)	2 (6%)	1 (3%)	1 (3%)
Victoria Park	24	1 (4%)	0 (0%)	6 (25%)	4 (17%)	0 (0%)	6 (25%)	0 (0%)	1 (4%)	0 (0%)	3 (13%)	0 (0%)	3 (13%)	0 (0%)	0 (0%)
Village Green	34	0 (0%)	0 (0%)	16 (47%)	3 (9%)	0 (0%)	8 (24%)	0 (0%)	0 (0%)	0 (0%)	3 (9%)	1 (3%)	2 (6%)	0 (0%)	1 (3%)
Virgil Village	53	5 (9%)	0 (0%)	13 (25%)	7 (13%)	0 (0%)	17 (32%)	0 (0%)	1 (2%)	0 (0%)	5 (9%)	0 (0%)	4 (8%)	0 (0%)	1 (2%)
Warehouse District	3	1 (33%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (67%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Warner Center	50	1 (2%)	1 (2%)	16 (32%)	2 (4%)	0 (0%)	15 (30%)	0 (0%)	0 (0%)	1 (2%)	7 (14%)	3 (6%)	1 (2%)	2 (4%)	1 (2%)
Watts	49	0 (0%)	5 (10%)	15 (31%)	1 (2%)	3 (6%)	10 (20%)	0 (0%)	1 (2%)	4 (8%)	3 (6%)	3 (6%)	4 (8%)	0 (0%)	0 (0%)
Wellington Square	4	0 (0%)	0 (0%)	1 (25%)	1 (25%)	0 (0%)	1 (25%)	0 (0%)	0 (0%)	1 (25%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
West Adams	54	1 (2%)	1 (2%)	21 (39%)	1 (2%)	2 (4%)	8 (15%)	0 (0%)	0 (0%)	1 (2%)	13 (24%)	1 (2%)	3 (6%)	2 (4%)	0 (0%)
Westchester	51	1 (2%)	0 (0%)	4 (8%)	6 (12%)	0 (0%)	21 (41%)	1 (2%)	2 (4%)	1 (2%)	9 (18%)	1 (2%)	5 (10%)	0 (0%)	0 (0%)
Westdale	49	1 (2%)	0 (0%)	12 (24%)	2 (4%)	0 (0%)	15 (31%)	0 (0%)	1 (2%)	1 (2%)	6 (12%)	2 (4%)	5 (10%)	3 (6%)	1 (2%)
Western Heights	41	0 (0%)	1 (2%)	6 (15%)	4 (10%)	1 (2%)	12 (29%)	1 (2%)	1 (2%)	1 (2%)	6 (15%)	2 (5%)	5 (12%)	0 (0%)	1 (2%)
West Hills	40	0 (0%)	0 (0%)	37 (93%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (3%)	1 (3%)	0 (0%)	1 (3%)	0 (0%)
Westlake	39	0 (0%)	2 (5%)	4 (10%)	4 (10%)	1 (3%)	16 (41%)	0 (0%)	2 (5%)	0 (0%)	5 (13%)	2 (5%)	3 (8%)	0 (0%)	0 (0%)
West Los Angeles	50	0 (0%)	0 (0%)	6 (12%)	10 (20%)	0 (0%)	23 (46%)	0 (0%)	0 (0%)	2 (4%)	4 (8%)	4 (8%)	0 (0%)	1 (2%)	0 (0%)
Westside Village	35	0 (0%)	0 (0%)	14 (40%)	4 (11%)	1 (3%)	6 (17%)	0 (0%)	0 (0%)	1 (3%)	6 (17%)	0 (0%)	3 (9%)	0 (0%)	0 (0%)
Westwood	49	2 (4%)	6 (12%)	0 (0%)	1 (2%)	2 (4%)	24 (49%)	0 (0%)	1 (2%)	5 (10%)	4 (8%)	1 (2%)	2 (4%)	1 (2%)	0 (0%)

Neighborhood	Total places	Arts and Entertainment	Cultural leisure	Business and Professional Services	Health & Beauty	Community and Government	Dining and Drinking	Event	Health and Medicine	Landmarks and Outdoors	Retail	Fashion stores	Basic provision shops	Sports and Recreation	Travels & Transportation
Westwood Village	49	0 (0%)	3 (6%)	8 (16%)	3 (6%)	1 (2%)	28 (57%)	0 (0%)	0 (0%)	0 (0%)	3 (6%)	1 (2%)	2 (4%)	0 (0%)	0 (0%)
Whitley Heights	51	2 (4%)	5 (10%)	4 (8%)	2 (4%)	1 (2%)	25 (49%)	0 (0%)	0 (0%)	9 (18%)	1 (2%)	0 (0%)	2 (4%)	0 (0%)	0 (0%)
Wholesale District	43	0 (0%)	3 (7%)	7 (16%)	1 (2%)	0 (0%)	11 (26%)	0 (0%)	1 (2%)	1 (2%)	11 (26%)	3 (7%)	4 (9%)	1 (2%)	0 (0%)
Wilmington	48	2 (4%)	0 (0%)	7 (15%)	3 (6%)	1 (2%)	17 (35%)	0 (0%)	0 (0%)	1 (2%)	12 (25%)	2 (4%)	3 (6%)	0 (0%)	0 (0%)
Wilshire Center	14	1 (7%)	0 (0%)	4 (29%)	3 (21%)	0 (0%)	5 (36%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (7%)	0 (0%)	0 (0%)
Wilshire Park	42	2 (5%)	0 (0%)	6 (14%)	3 (7%)	0 (0%)	17 (40%)	0 (0%)	0 (0%)	1 (2%)	5 (12%)	3 (7%)	3 (7%)	2 (5%)	0 (0%)
Wilshire Vista	43	0 (0%)	0 (0%)	9 (21%)	12 (28%)	2 (5%)	9 (21%)	0 (0%)	1 (2%)	2 (5%)	4 (9%)	1 (2%)	3 (7%)	0 (0%)	0 (0%)
Windsor Square	19	1 (5%)	0 (0%)	3 (16%)	4 (21%)	0 (0%)	1 (5%)	0 (0%)	0 (0%)	3 (16%)	2 (11%)	5 (26%)	0 (0%)	0 (0%)	0 (0%)
Winnetka	52	0 (0%)	1 (2%)	19 (37%)	4 (8%)	0 (0%)	16 (31%)	0 (0%)	0 (0%)	2 (4%)	8 (15%)	0 (0%)	2 (4%)	0 (0%)	0 (0%)
Woodland Hills	50	1 (2%)	0 (0%)	8 (16%)	9 (18%)	0 (0%)	17 (34%)	0 (0%)	0 (0%)	1 (2%)	9 (18%)	2 (4%)	3 (6%)	0 (0%)	0 (0%)

TAB 2 Neighborhood count of business/*place* per category

	Total	Neighborhoods	% appearance
Dining and Drinking	2491	180	29.8 %
Business and Professional Services	2016	180	24.1 %
Retail	1108	185	13.3 %
Health &amp	729	156	8.7 %
Basic provision shops	453	151	5.4 %
Landmarks and Outdoors	383	131	4.6 %
Fashion stores	298	122	3.6 %
Cultural leisure	242	94	2.9 %
Arts and Entertainment	163	98	2.0 %
Community and Government	162	94	1.9 %
Sports and Recreation	161	80	1.9 %
Health and Medicine	77	56	0.9 %
Travel and Transportation	60	49	0.7 %
Event	15	14	0.2 %

TAB 3 Count of total *places* per category, and *places* in each neighborhood, ordered from most to least frequent