# City of Los Angeles
# Housing Recommendation System

**April 19, 2017**
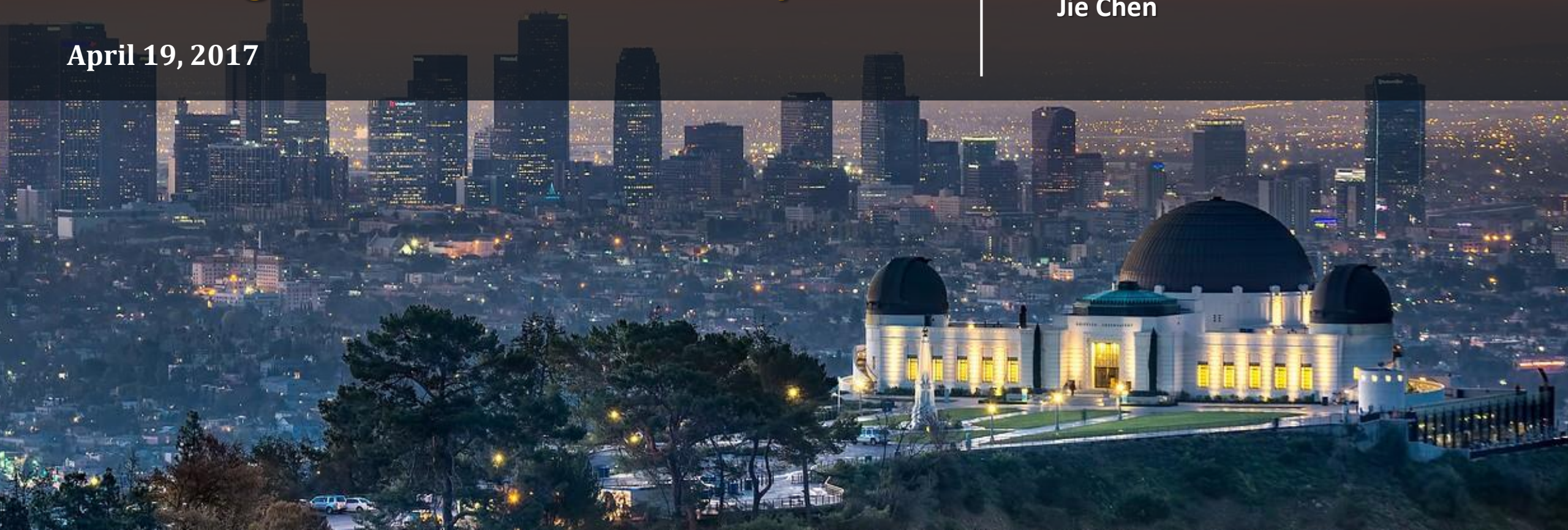
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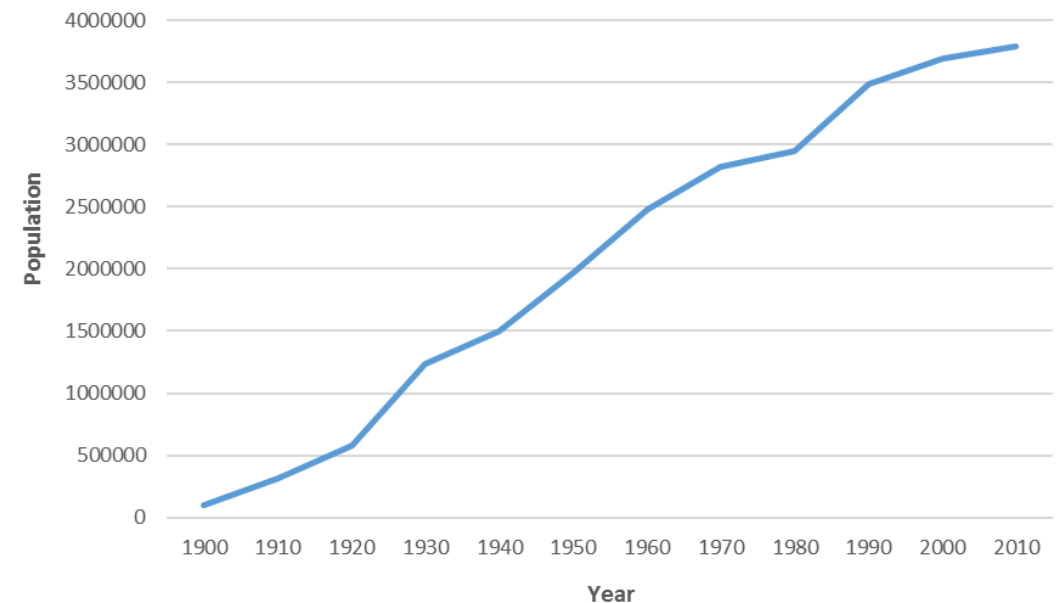
# CONTENTS

# BUSINESS QUESTIONS

**Problem of Interests**

**1** Where should you live if you are new to Los Angeles?

**2** What factors affect your decision?

**3** What resources do you use to find housing?

Where can I afford to live in Los Angeles?

### Population Growth in Los Angeles



Population has been increasing rapidly over the years

# BUSINESS QUESTIONS

- ✔ Price
- ✔ Crime
- ✔ Demographics
- ✔ Vitality

# BUSINESS QUESTIONS

## Common Resources

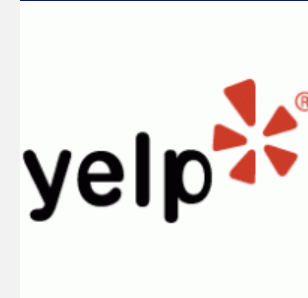| Zillow | Wikipedia | Craigslist | Yelp | Google |
|--------|-----------|------------|------|--------|

| Trulia | Redfin | Thrillist | Walkscore | Spot Crime |
|--------|--------|-----------|-----------|------------|

# DATASET DESCRIPTION

**Dataset**

**\* Used all open source datasets for City of Los Angeles**

| Dimension | Data | Time Frame | Dataset |
|---|---|---|---|
| Safety | Total Crime Index | 2016 | LA City Crime Index |
| Demographics | Avg. Household Size | 2010 | 2010_Census_Populations_by_Zip_Code |
| | Total Population | 2010 | 2010_Census_Populations_by_Zip_Code |
| | Median Age | 2010 | 2010_Census_Populations_by_Zip_Code |
| | Race | 2014 | LA_City_General_Population_by_Race_-_2014 |
| | Occupation | 2013 | Employment_by_Occupation_by_Gender_for_Council_Districts |
| | Income | 2013 | Median_Household_Income_by_Council_Districts |
| | Average Rental Price | 2017 | Zillow |
| Vitality | New Commercial Bldgs | 2013-2017 | New_Building_Commercial |
| | New Constructions | 2015-2017 | New_Construction_Permits_2015 |
| | Events | 2015-2017 | What_s_Happening_LA_Calendar_Dataset |
| | Walkscore | 2017 | Walkscore.com |

# DATASET DESCRIPTION

## Grouped Variables

- ✓ 105 Observations
- ✓ Zip Code
- ✓ Neighborhood
- ✓ Council District
- ✓ Total Population
- ✓ Median Age
- ✓ Race

- ✓ Occupation
- ✓ New Commercial Buildings
- ✓ New Construction
- ✓ Events/ Activities
- ✓ Walkscore
- ✓ Median Household Income

## Ranking Methodology

- ✓ Highest score per variable receives highest rank from 1-105 (1 being highest)
- ✓ User indicates specified weights
- ✓ Overall Score calculated based on user input
- ✓ Rank ideal neighborhood calculated from highest score:
  (calculated weights * variable score)

# COST OF LIVING

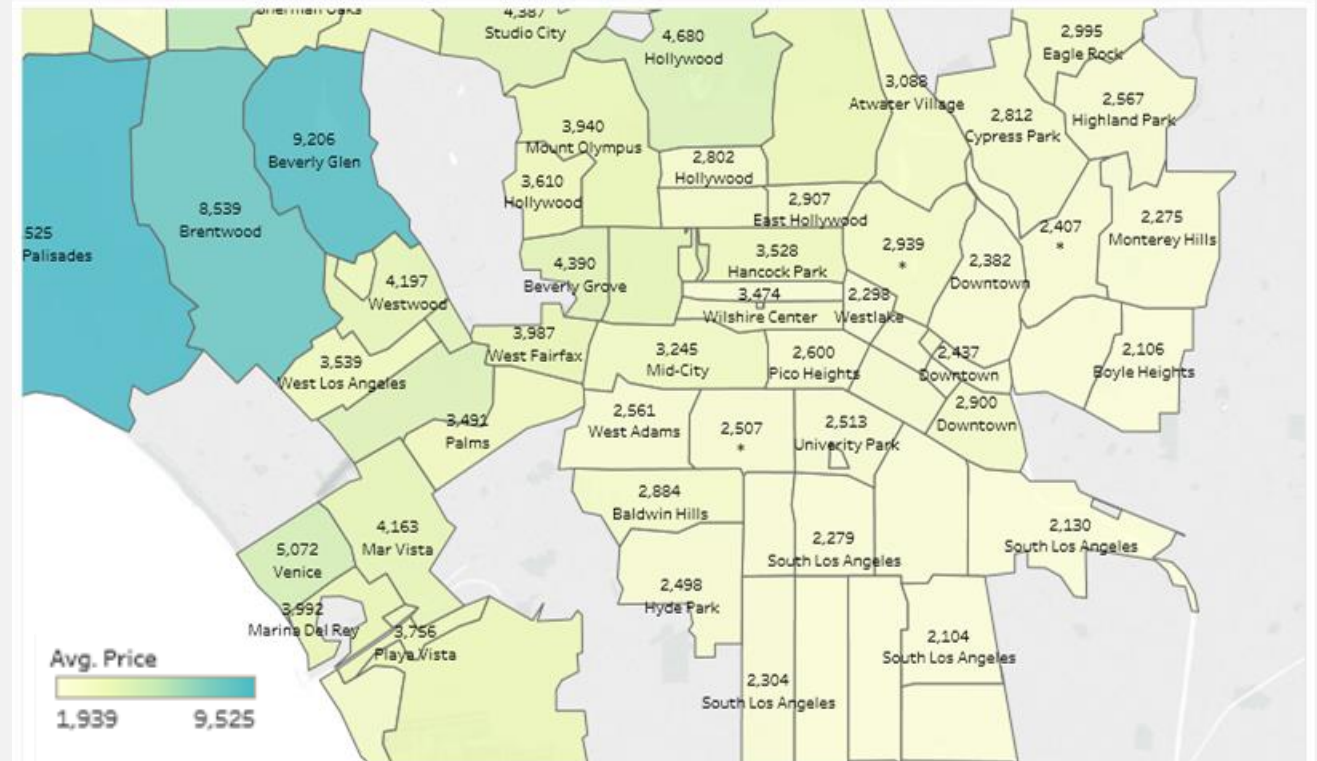## What does your budget look like?

**1** **Cheapest Neighborhoods:**

South Los Angeles
Boyle Heights
Wilmington
Monterey Hills
Downtown

**2** **Priciest Neighborhoods:**

Pacific Palisades
Beverly Glen
Brentwood
Encino
Venice

**Average Rental Price by Zip code**



**Average 1 bedroom in Los Angeles as of March 2017 is $2,313**
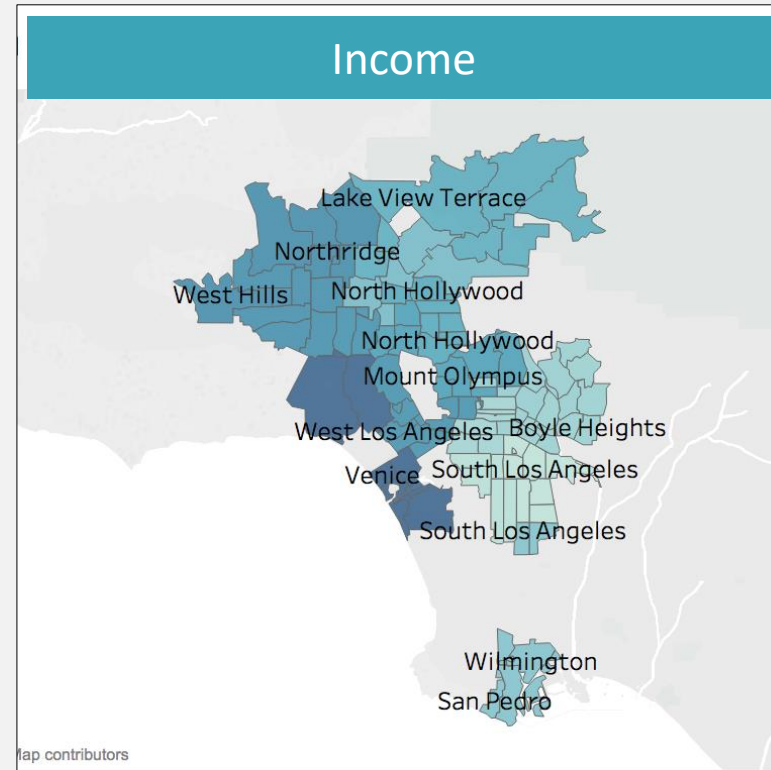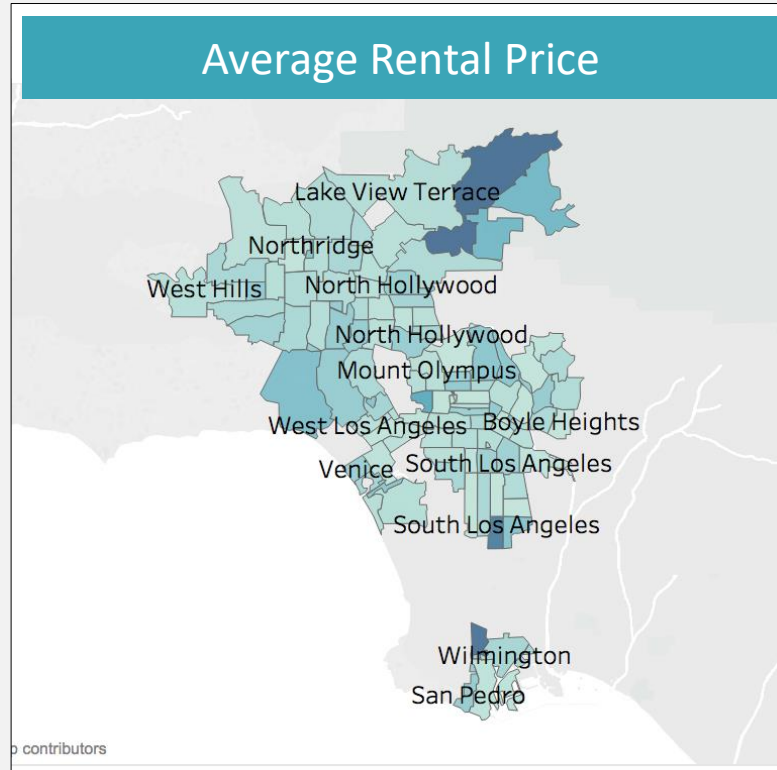
# DEMOGRAPHIC INFORMATION

WHAT

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DEMO

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Average Rental Price


Income

Highest Median Income:

- ➢ Mar Vista
- ➢ Westchester
- ➢ Brentwood
- ➢ Venice
- ➢ Pacific Palisades

Lowest Median Income:

- ➢ South Los Angeles
- ➢ University Park
- ➢ Hyde Park
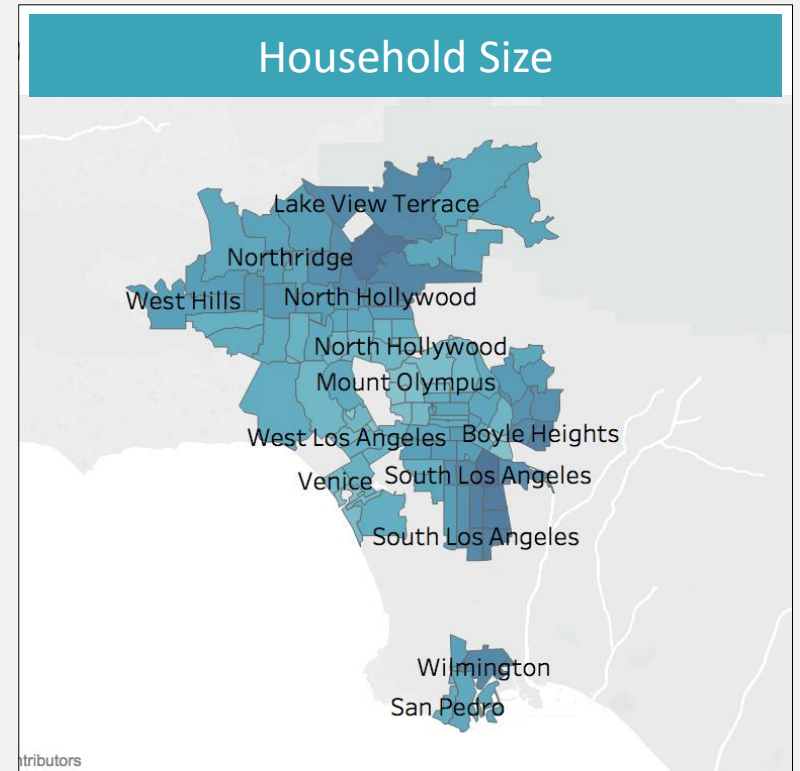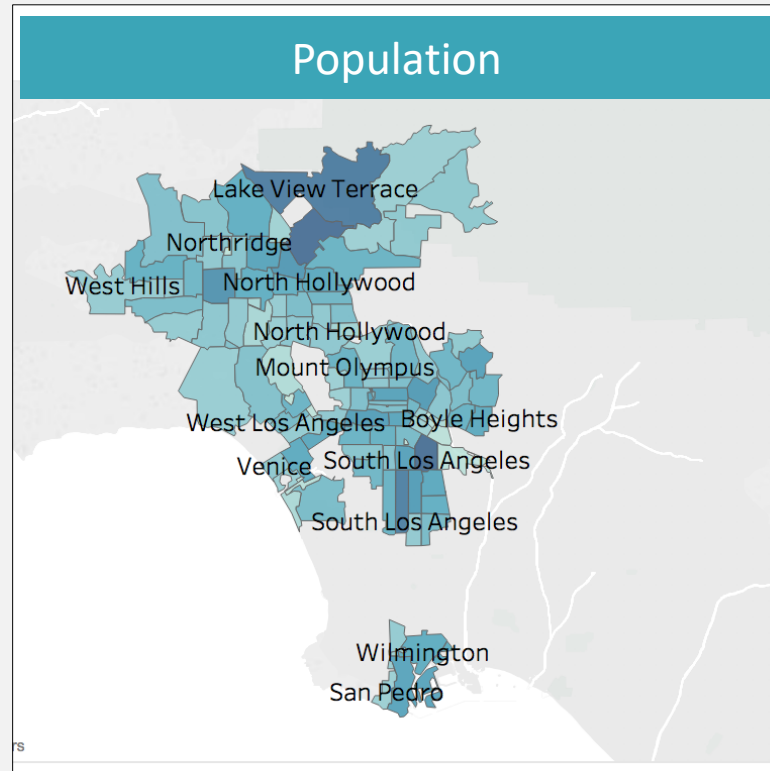- ➢ Baldwin Hills
- ➢ Mid-City

# DEMOGRAPHIC INFORMATION

Highest Total Population:

➢ South Los Angeles
➢ Pacoima
➢ Lake View Terrace
➢ North Hollywood
➢ Panorama City

Lowest Total Population:

➢ Century City
➢ Wilshire Center
➢ Playa Vista
➢ Beverly Glen
➢ Playa Del Rey



Population



Household Size

# VITALITY

Walkscore


New Commercial Buildings
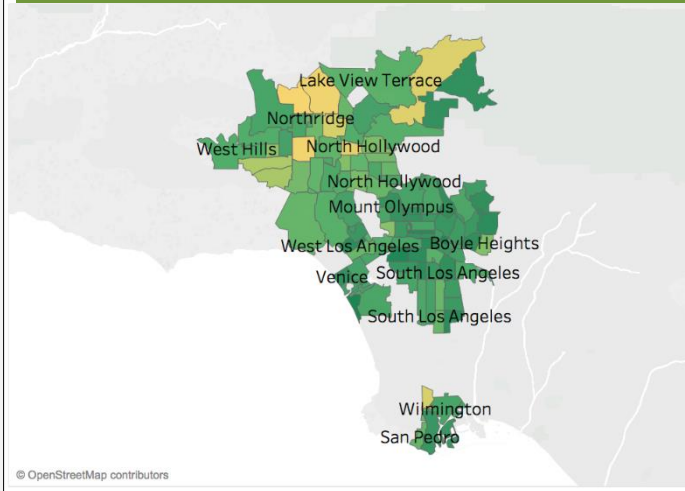

New Constructions
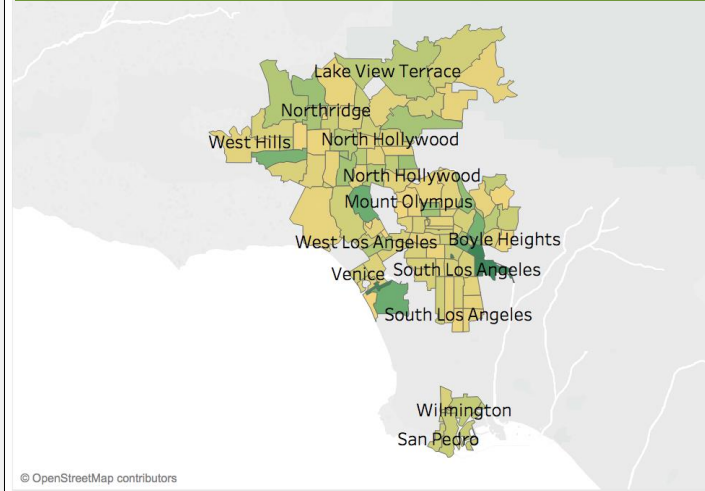

Events

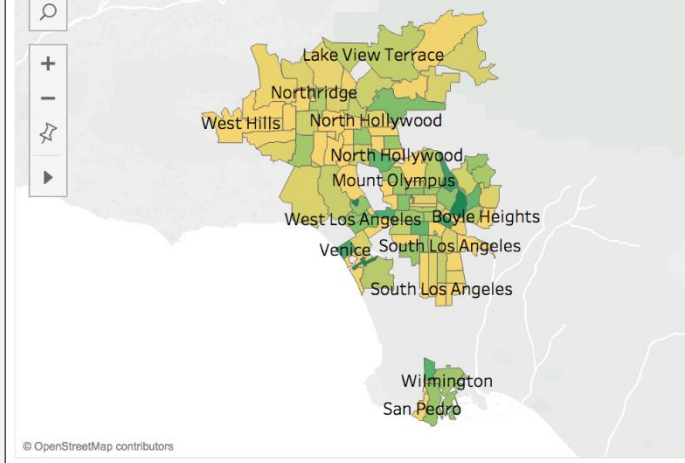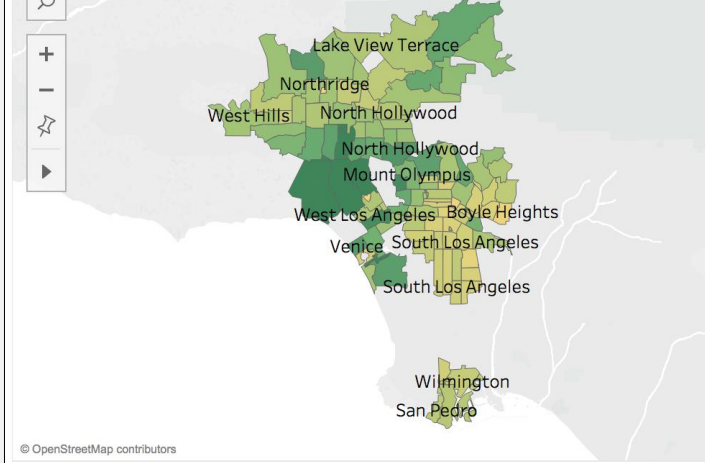Highest Vitality Score:

➢ Valley Village
➢ Pacoima
➢ Mar Vista
➢ Woodland hills
➢ West Hills

Lowest Vitality Score:

➢ Northridge
➢ Sherman Oaks
➢ Beverly Glen
➢ University Park
➢ West Adams
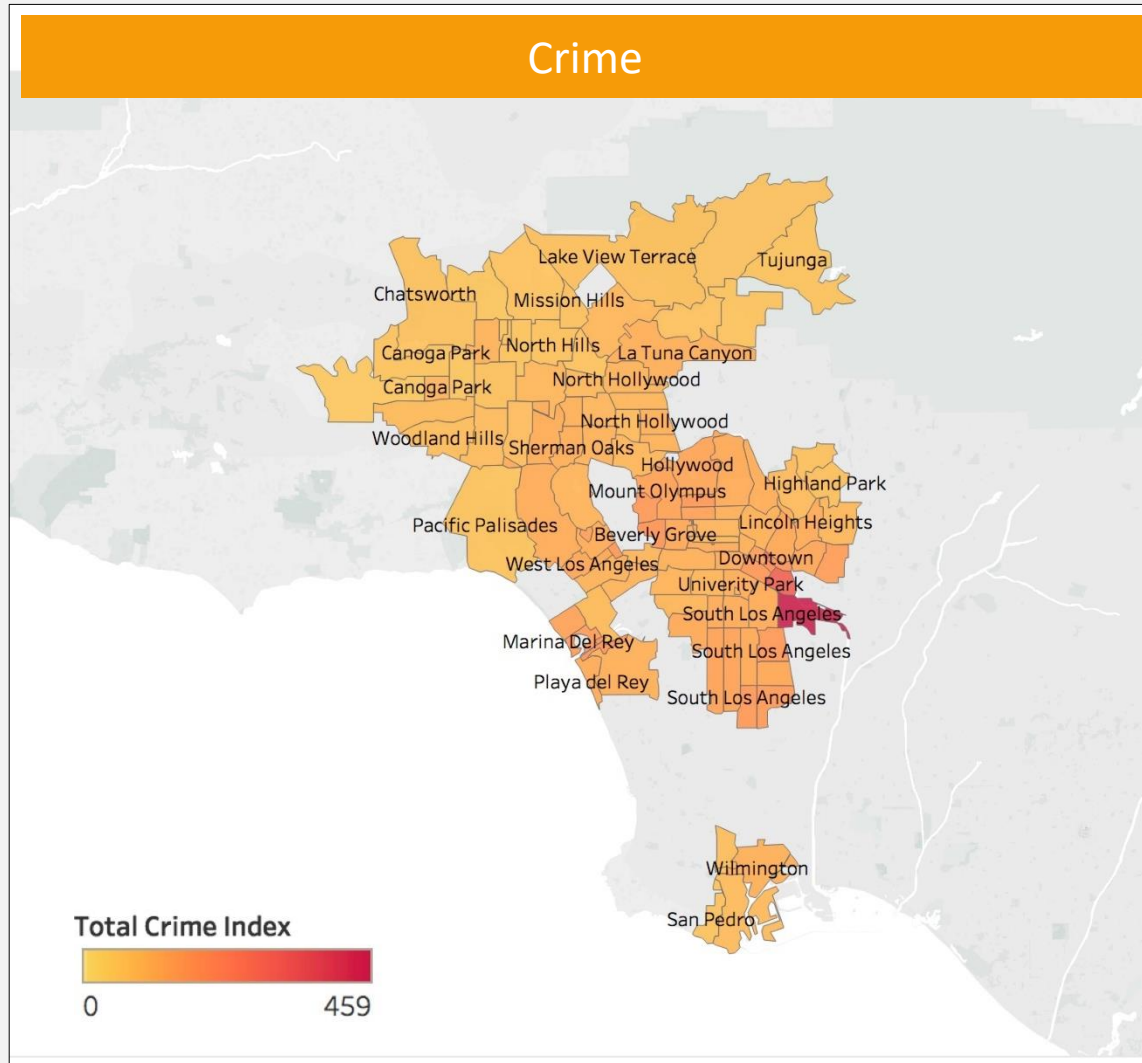
# CRIME



- ✓ Map based on Longitude (generated) and Latitude (generated).

- ✓ Color shows Total Crime Index as an attribute.

- ✓ The marks are labeled by Neighborhood.

- ✓ Details are shown for Zip.

# K-MEAN CLUSTERING



Cluster

- ✓ Map based on Longitude (generated) and Latitude (generated).

- ✓ Color shows Cluster as an attribute.

- ✓ The marks are labeled by Neighborhood.

- ✓ Details are shown for Zip.

WHAT

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# K-MEAN CLUSTERING

## Groups

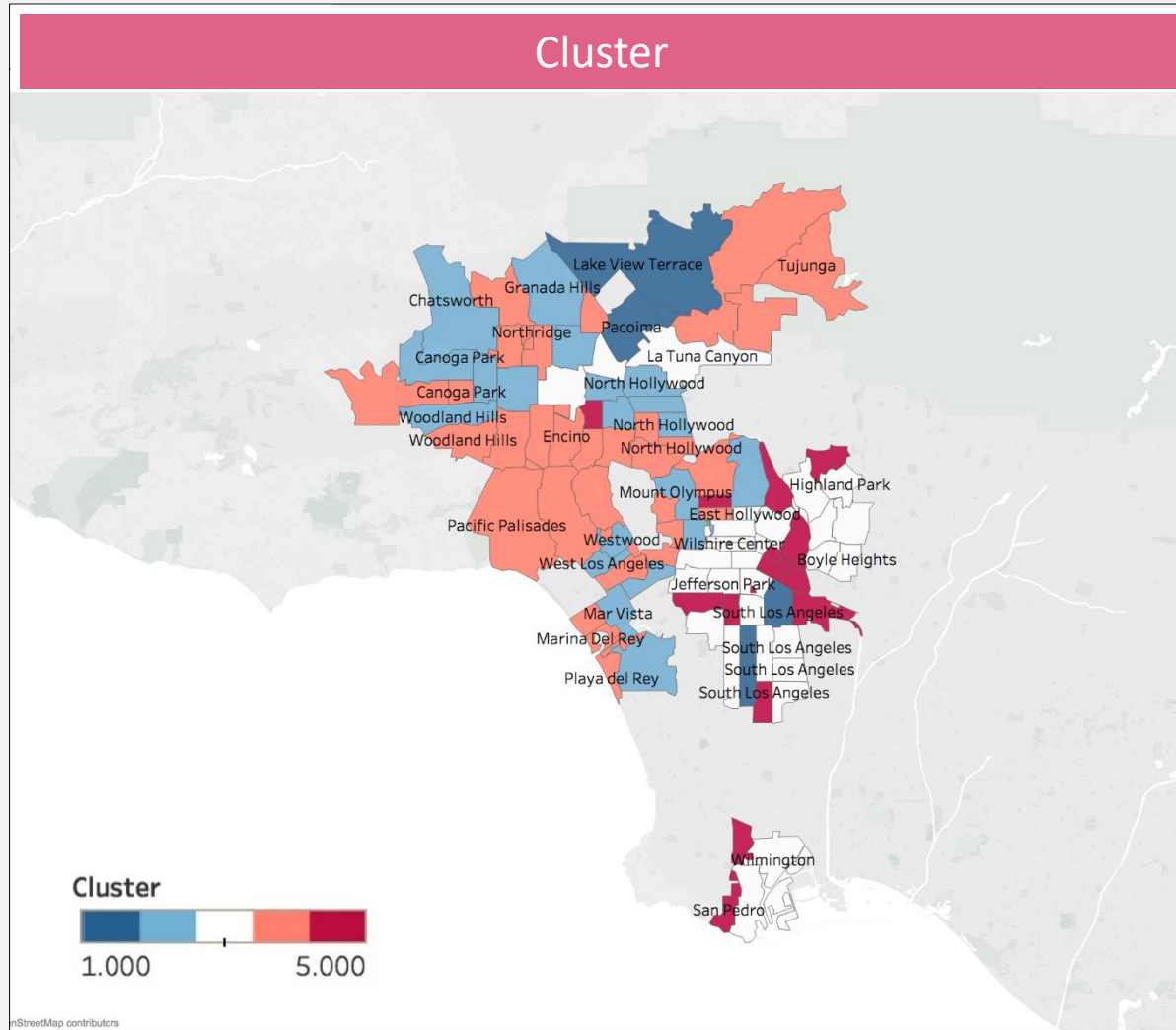| Cluster | Neighborhoods |
|---|---|
| 1 (19 neighborhoods) | Atwater Village,Baldwin Hills, Downtown, Eagle Rock, Harbor City, Hollywood, San Pedro, South Los Angeles, USC, Van Nuys, Wilshire Center |
| 2 (33) | Beverly Glen, Beverly Grove, Brentwood, Canoga Park, Century City, Cheviot Hills, Encino, Hollywood, Marina Del Rey, Mission Hills, North Hollywood, Northridge, Pacific Palisades, Playa del Rey, Playa Vista, Shadow Hills, Sherman Oaks, Studio City, Tarzana, Tujunga, Valley Village, Venice, West Fairfax, West Hills, Westwood, Woodland Hills |
| 3 (29) | Beverly Glen, Beverly Grove, Canoga Park, Century City, Cheviot Hills ,Encino, Hollywood, Marina Del Rey, Mission Hills, North Hollywood, Northridge, Pacific Palisades, Playa del Rey, Playa Vista, Shadow Hills, Sherman Oaks, Studio City, Tarzana, Tujunga, Valley Village, Venice, West Fairfax, West Hills, Westwood, Woodland Hills |
| 4 (20) | Boyle Heights, Cypress Park, East Hollywood, Echo Park, Hancock Park, Hyde Park, Jefferson Park, Koreatown, La Tuna Canyon, Lake Balboa, Lincoln Heights, Mid-City, Monterey Hills, Panorama City, Pico Heights, San Pedro, South Los Angeles, Univerity Park, West Adams, Westlake, Wilmington |
| 5 (4) | South Los Angeles, Pacoima, Lake View Torrance |

# K-MEAN CLUSTERING

## Details (Continued)

| Cluster | Total Population | Median Age | Average Household Size | Asian | African American | Hispanic Or Latino | Other | White | Walkscore | Average Rental Price |
|---------|------------------|------------|------------------------|-------|------------------|--------------------|-------|-------|-----------|----------------------|
| 1 | 18669.1 | 36.1 | 2.3 | 10.4 | 10.9 | 64.57 | 2.4 | 11.8 | 67.4 | 3536.1 |
| 2 | 21953.2 | 40.5 | 2.3 | 13.0 | 4.5 | 26.6 | 3.6 | 52.2 | 57.3 | 3494.6 |
| 3 | 51839.0 | 31.9 | 3.3 | 11.4 | 12.0 | 64.4 | 2.1 | 10.2 | 74.8 | 2803.2 |
| 4 | 47977.0 | 35.3 | 2.6 | 12.3 | 4.7 | 29.1 | 3.5 | 50.4 | 52.2 | 2793.5 |
| 5 | 97271.3 | 29.1 | 4.2 | 5.0 | 14.5 | 68.8 | 1.6 | 10.1 | 71.3 | 2894.0 |

# K-MEAN CLUSTERING

## Details (Continued)

| Cluster | Median Income | Mgmt Business Science Arts | Natural Resources Construction and Maintenance | TRANS | Sales And Office | Service | Total Crime Index | New Constructions (Per Capita) | New Commercial Bldgs (Per Capita) | Events (Per Capita) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 37885.5 | 24.8 | 10.2 | 17.0 | 23.6 | 24.4 | 141.8 | 46.8 | 4.9 | 2724.5 |
| 2 | 65575.1 | 50.4 | 5.2 | 6.4 | 23.2 | 14.7 | 90.0 | 13.2 | 0.4 | 33.5 |
| 3 | 37400.0 | 22.1 | 10.3 | 17.8 | 23.4 | 26.5 | 95.6 | 3.4 | 0.2 | 3.8 |
| 4 | 63541.1 | 47.3 | 6.0 | 7.2 | 23.4 | 16.2 | 79.3 | 6.9 | 0.3 | 3.0 |
| 5 | 40257.3 | 18.3 | 11.9 | 20.1 | 23.6 | 26.1 | 90.8 | 3.6 | 0.2 | 2.5 |

WHAT

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?

# DASHBOARD (Demo)

# Questions

# Thank You