Capstone Project
Battle of the Neighborhoods – Week 2

IBM Coursera

Data Science Specialization

Introduction

- Covid-19 pandemic has upended economies and affected businesses and workers
- Layoffs and re-locations have been common occurrence
- Re-location to another city poses many challenges to employees
- Where to stay is the first biggest challenge
- Machine learning (ML) algorithms can help identify suitable places to stay

The problem (or opportunity)

John Smith works at ACME Widgets in Southern California

Company has offered him relocation to Austin, Texas

Austin is a vibrant city and fast-growing metropolitan area

Many neighborhoods to choose from

John would like to stay in a neighborhood like his present one – Westpark in Irvine CA

The Solution

- K-Means is a Machine Learning algorithm used for clustering entities based on their features
- The problem is an ideal use case for K-Means
- Publicly available data sets and cloud computing platforms make it affordable or free to apply ML techniques

The Data

Many publicly available databases

Data sources used for the report

City of Austin data portal

Foursquare – location data platform

Nominatim – Open Source geocoding data

Data Summary

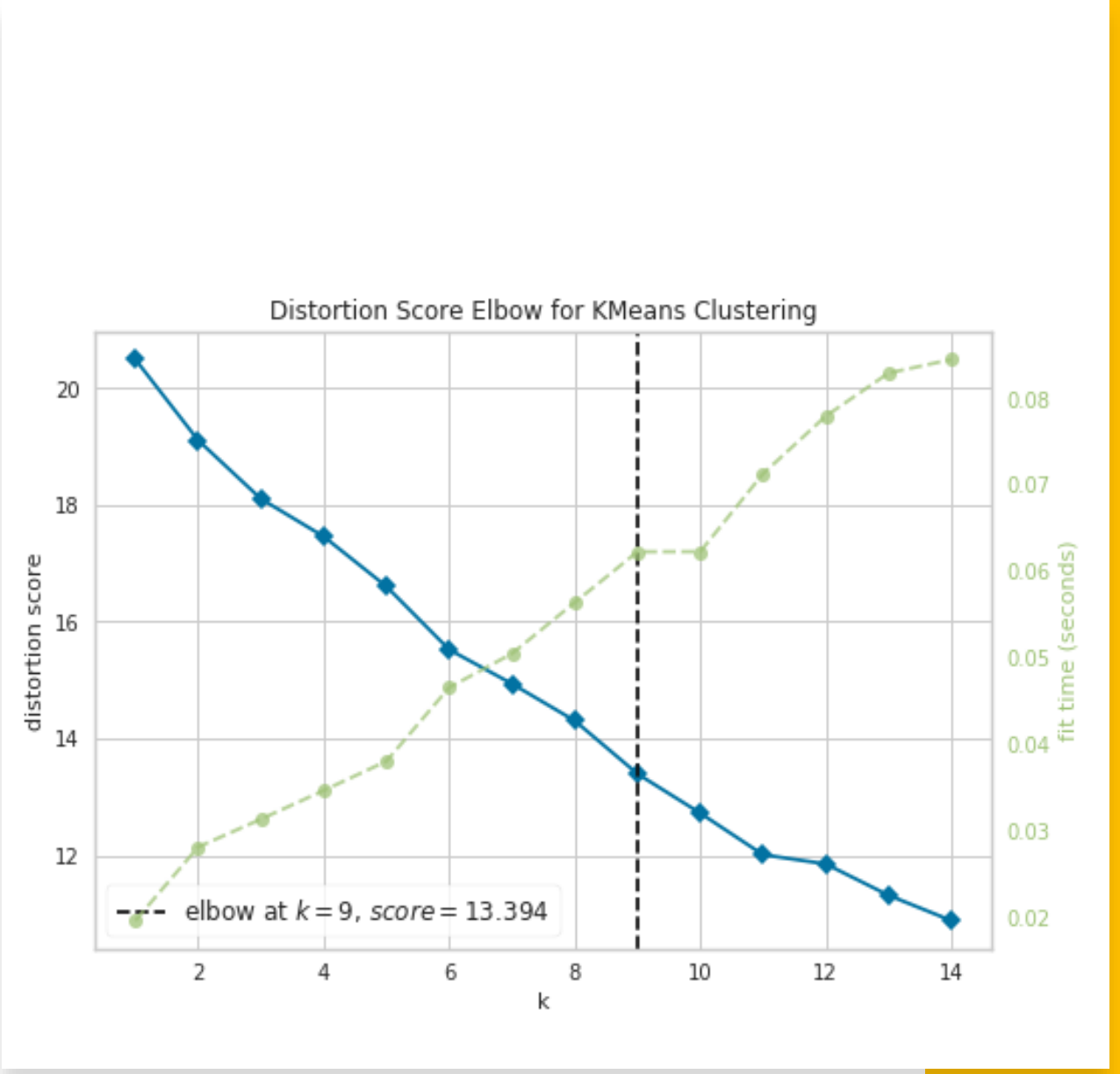
86 NEIGHBORHOODS IN CITY OF AUSTIN

WESTPARK WAS GROUPED WITH AUSTIN NEIGHBORHOODS FOR K-MEANS TO CLASSIFY

DATA ON 1284 VENUES USED FOR CLUSTERING SIMILAR NEIGHBORHOODS

Use the elbow

- How many clusters or groups should we divide the neighborhoods in
- The elbow method provides the answer – 9 clusters



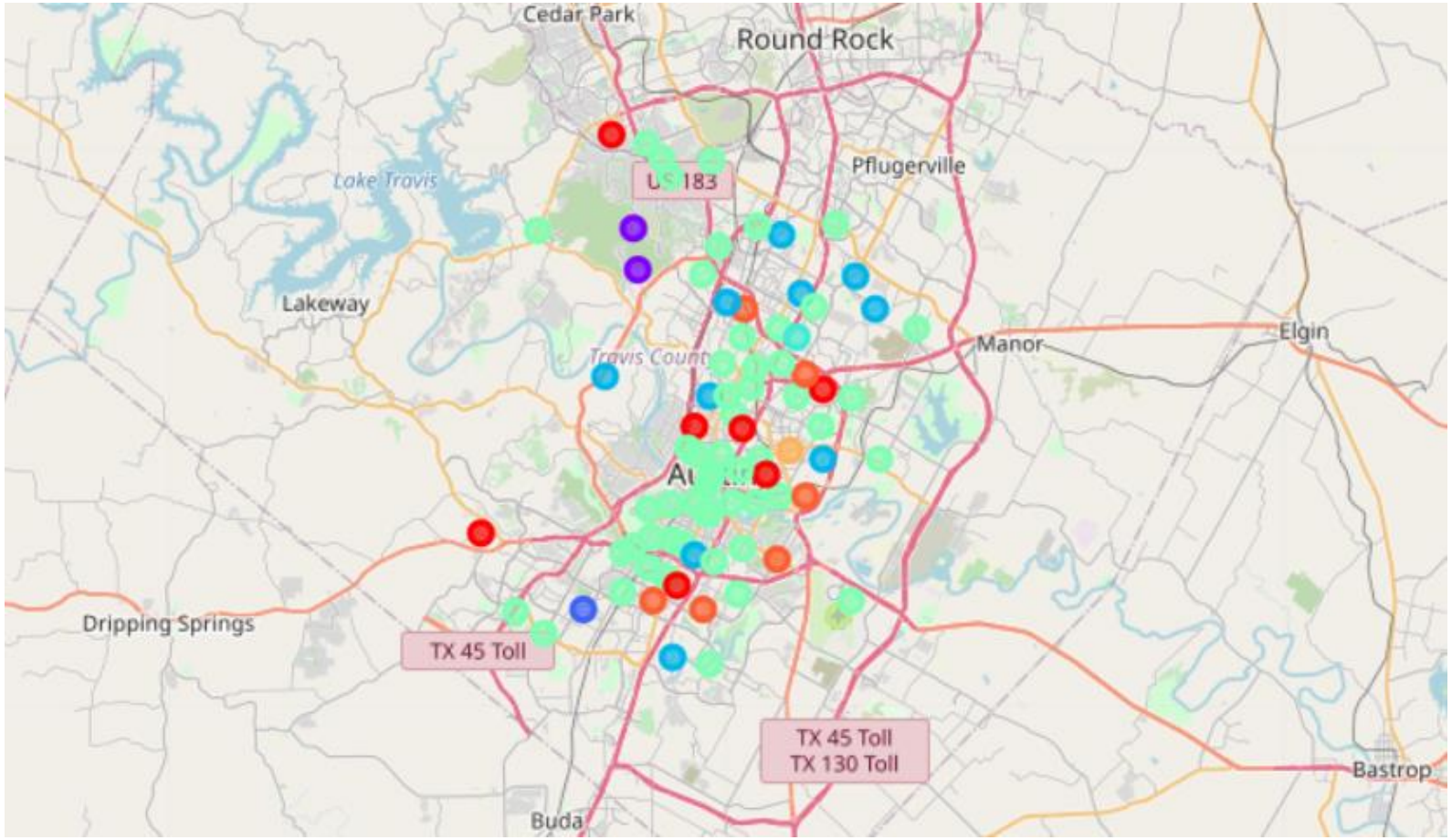
The lucky cluster

- The Westpark neighborhood was clustered with the following Austin neighborhoods

	neighborhood	latitude	longitude	cluster labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Westpark, Irvine CA	33.6913524	-117.8088444	0	Playground	Park	Other Repair Shop	Pool	Moving Target
1	WEST OAK HILL	30.2384802	-97.8890123	0	Brewery	Playground	Park	Farm	French Restaurant
2	EAST CONGRESS	30.2103976	-97.7660519	0	Restaurant	Convenience Store	Taco Place	Park	Yoga Studio
3	HANCOCK	30.2958956	-97.7247678	0	Park	Mexican Restaurant	Golf Course	Yoga Studio	Farm
4	OLD WEST AUSTIN	30.296822	-97.7548514	0	Park	Shop & Service	Food Truck	Tanning Salon	Yoga Studio
5	UNIVERSITY HILLS	30.3175801	-97.6739168	0	Bridal Shop	Arts & Entertainment	Park	Fast Food Restaurant	Fried Chicken Joint
6	ANDERSON MILL	30.4558345	-97.8070957	0	Park	Food Truck	Pool	Dog Run	Yoga Studio
7	ROSEWOOD	30.2713704	-97.7101117	0	Park	Pool Hall	CafÃ©	Gym / Fitness Center	Soccer Field

	neighborhood	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue	sqdist
0	Westpark, Irvine CA	Escape Room	Food Truck	Food Court	Food & Drink Shop	Food	
1	WEST OAK HILL	Frame Store	Fountain	Food Truck	Food Court	Food & Drink Shop	5.35
2	EAST CONGRESS	Escape Room	Fountain	Food Truck	Food Court	Food & Drink Shop	5.39
3	HANCOCK	Frame Store	Fountain	Food Truck	Food Court	Food & Drink Shop	5.4
4	OLD WEST AUSTIN	Farm	Frame Store	Fountain	Food Court	Food & Drink Shop	5.52
5	UNIVERSITY HILLS	French Restaurant	Frame Store	Fountain	Food Truck	Food Court	7.05
6	ANDERSON MILL	Farm	Frame Store	Fountain	Food Court	Food & Drink Shop	7.95
7	ROSEWOOD	Yoga Studio	Farm	Fountain	Food Truck	Food Court	9.57

Visualizing clusters on the map



Conclusion

The K-Means algorithm identified 7 Austin Neighborhoods like Westpark

John should start with these neighborhoods first

Qualitative information is also important

- Opinion of real estate agents in Austin
- Visual impression of the neighborhood

Happy Exploring!