



# CAPSTONE PROJECT

# USA-TOUR 2020

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# 1. Introduction

## STUDY CASE : TOURING IN USA

- Which concert venues will provide the most visibility to the band and are most likely to be crowded during shows? Pick the best venues !
- In what order should the shows be played?  
Minimize travel distances !

Interest : Individuals/ Travel Agencies/ Businesses



## 2. Data

# Acquisition and Cleaning

### SOURCES

- City names and States : Wikipedia
- City Coordinates : Geolocator
- City Venues : Foursquare API



# 3. Methodology

## STEPS :

- Step 1 : Get the names of the capital cities in each state of America
- Step 2 : For each city explore for music venues and gather them in a data frame after cleaning.
- Step 3 : Get the ratings and like of each venue and order them by popularity
- Step 4 : Pick the best ranking avenue.
- Step 5 : Start again from step 2 with the next city and implement the result each time on our final tour list.
- Step 6 : Order the final tour list by order of passage. (Find optimal path)



# 3. Methodology

## SIMPLIFICATIONS

- We set a query limit to 10 venues per city.
- We assume that the popularity of the venue is given by its rating and number of likes.
- Travelling Salesman Problem : we go through 20 cities instead of 50 (too computationally expensive)
- The approximate distance between two cities is calculated with a mathematical equation (no Google Maps)



# 4. Results

FOR 1 CITY : NEW YORK CITY



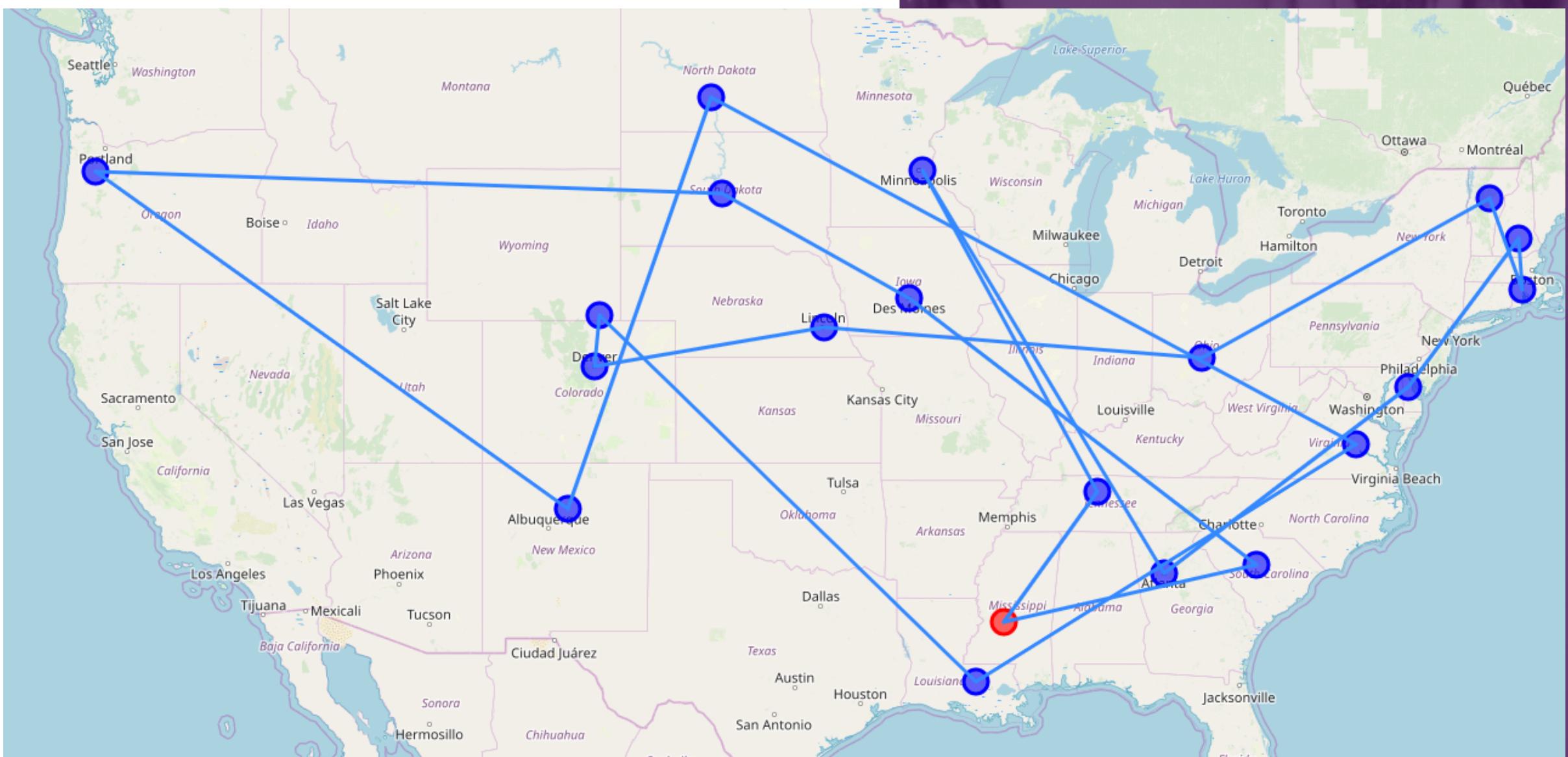
		name	categories	address	city	state	lat	lng		id	Ratings	Likes
2		Radio City Music Hall	Concert Hall	1260 Avenue of the Americas	New York	NY	40.759850	-73.979344	4161e400f964a520721d1fe3	9.4	3219.0	
3		Prospect Park Bandshell / Celebrate Brooklyn!	Performing Arts Venue	Prospect Park West	Brooklyn	NY	40.663317	-73.976107	485e640df964a520d7501fe3	9.4	1047.0	
4		Concert Ticket Agency	Performing Arts Venue	1650 Broadway #403	New York	NY	40.761624	-73.983218	4fa004cde4b08f8515a59981	8.5	57.0	
11		New York Philharmonic: Concerts in the Parks	Concert Hall	Prospect Park	Brooklyn	NY	40.661900	-73.974868	4ffe155be4b0d9a11c535709	7.9	16.0	
9		Kaufmann Concert Hall	Concert Hall	1395 Lexington Ave	New York	NY	40.782852	-73.952263	4eac93310aa9e9a23c8e928	7.6	16.0	
0		Merkin Concert Hall	Concert Hall	129 W 67th St	New York	NY	40.775179	-73.983130	3fd66200f964a52024e81ee3	7.4	62.0	
8		New York Philharmonic: Concerts in the Parks -...	Music Venue	Central Park	New York	NY	40.781589	-73.966656	5b21a8c879f6c7002ccac83	NaN	6.0	
1		Ernst C. Stiefel Concert Hall At Arnhold Hall	Performing Arts Venue	55 W 13th St Fl 4	New York	NY	40.736538	-73.996450	5a70f53d840fc2162f018d52	NaN	1.0	
5		The Concert Hall	Concert Hall	2 W 64th St	New York	NY	40.771077	-73.979740	4ce7dd34f1c6236a511a5cf0	NaN	1.0	
10		International Concerts	Performing Arts Venue	529 W 29th St	New York	NY	40.751386	-74.003348	55772b9e498ebb62abbaa10e	NaN	1.0	
6		Bushwick Concert Loft	Music Venue	NaN	Brooklyn	NY	40.706040	-73.921579	567f953d498e91e73a2aef6e	NaN	0.0	
7		Frank Sinatra School Of The Arts Concert Hall	Concert Hall	NaN	Long Island City	NY	40.756006	-73.924613	4f774305e4b042108299569a	NaN	0.0	

Best venue to play n NYC : "Radio City Music Hall"

# 4. Results

# FOR 20 CITIES : USA TOUR

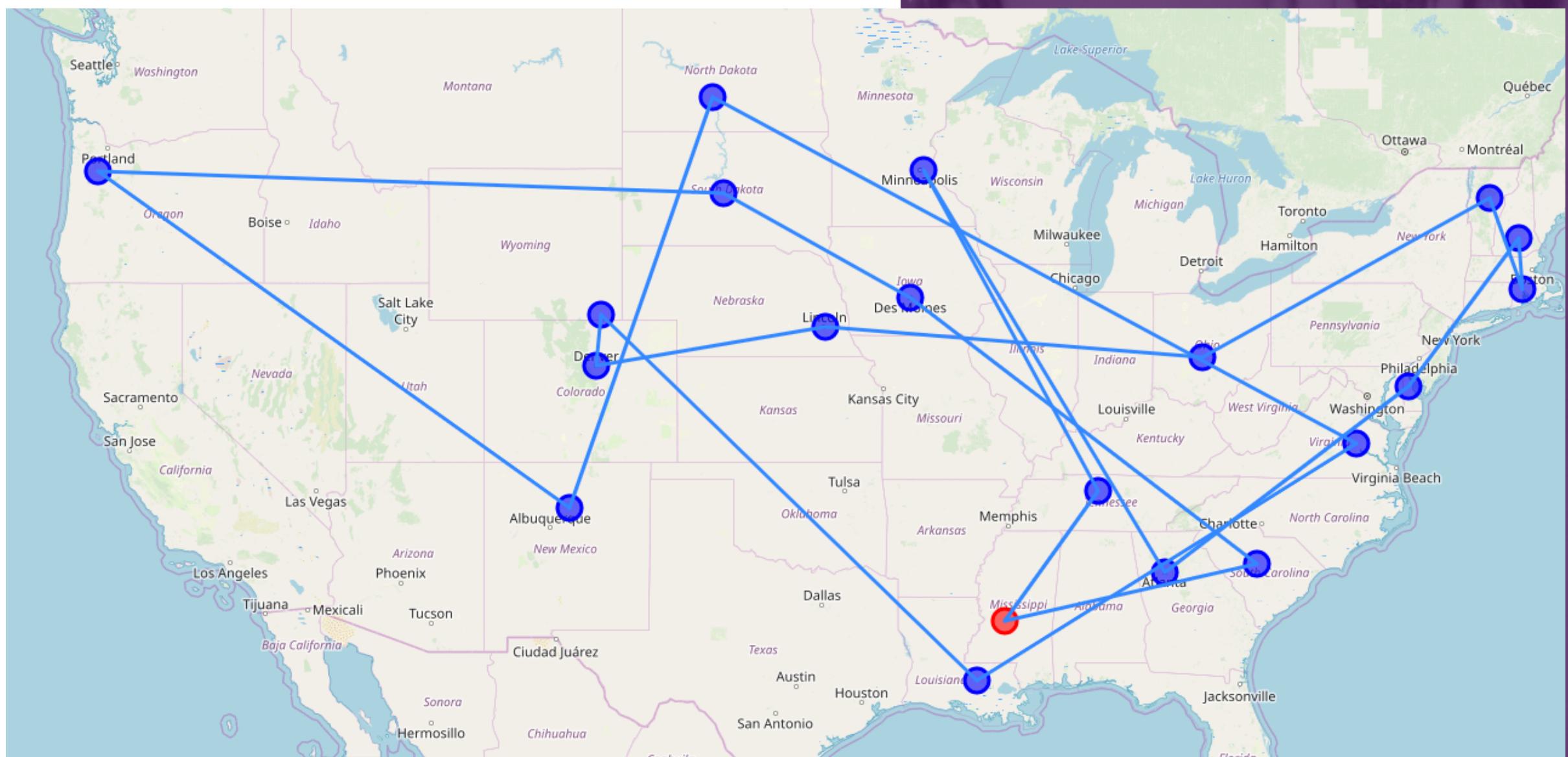
	Name of State	Abbreviation	Capital City	Latitude	Longitude
0	Missouri	MO	Jefferson City	38.577359	-92.172427
1	Pennsylvania(E)	PA	Harrisburg	40.266311	-76.886112
2	North Dakota	ND	Bismarck	46.808327	-100.783739
3	Connecticut	CT	Hartford	41.764582	-72.690855
4	Nevada	NV	Carson City	39.164897	-119.766582
5	Maine	ME	Augusta	44.310583	-69.779663
6	Nebraska	NE	Lincoln	40.800000	-96.667821
7	New York	NY	Albany	42.651167	-73.754968
8	South Carolina	SC	Columbia	34.000749	-81.034331
9	Washington	WA	Olympia	47.045102	-122.895008
10	Rhode Island(F)	RI	Providence	41.823989	-71.412834
11	Wisconsin	WI	Madison	43.074761	-89.383761
12	Kansas	KS	Topeka	39.049011	-95.677556
13	Vermont	VT	Montpelier	44.260445	-72.575684
14	Colorado	CO	Denver	39.739236	-104.984862
15	North Carolina	NC	Raleigh	35.780398	-78.639099
16	New Jersey	NJ	Trenton	40.217058	-74.742946
17	Virginia(E)	VA	Richmond	37.538509	-77.434280
18	Massachusetts(E)	MA	Boston	42.360253	-71.058291
19	Kentucky(E)	KY	Frankfort	38.200905	-84.873284



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# 5. Conclusion

## IMPROVEMENTS AND LIMITS

- Premium accesses Foursquare API / Google Maps API : exploring a greater number of venues and finding real travel distances (highway/roads)
- Foursquare API : works with a "radius", not optimal to get the real limits of a city
- Travelling Salesman Problem : we are limited by the number of nodes, too many nodes means too complex.
- Many real-life applications : personalized guided tours through cities for individuals, optimal transportation , etc ..

