



Data Glacier

Your Deep Learning Partner

G2M Case Study

Virtual Internship LISUM12

G2M Insight for Cab Investment Firm – Week 3

August 21st 2022

Executive Summary – G2M (Cab Industry) Case Study

- XYZ is a private equity firm in US. Due to remarkable growth in the Cab Industry in last few years and multiple key players in the market, it is planning for an investment in Cab industry.
- Objective : Provide actionable insights to help XYZ firm in identifying the right company for making investment.

The analysis has been divided into four sections:

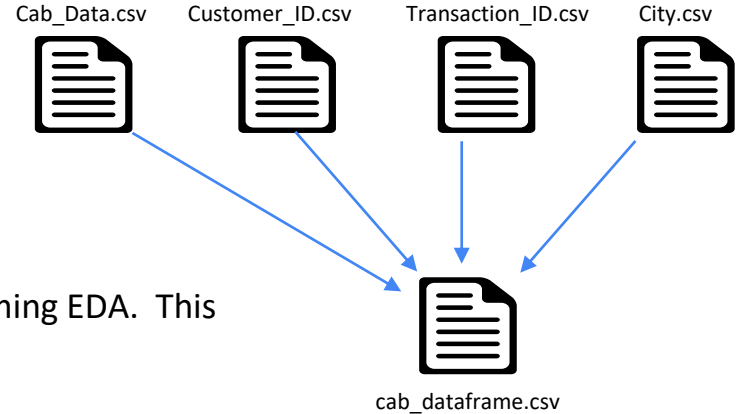
- Defining the problem
- Understanding and collecting data
- Using the data to find the most profitable cab company
- My recommendations for investing

Data Exploration

- 20 Features (including 2 derived features)
- Timeframe of the data: 01-31-2016 to 12-31-2018

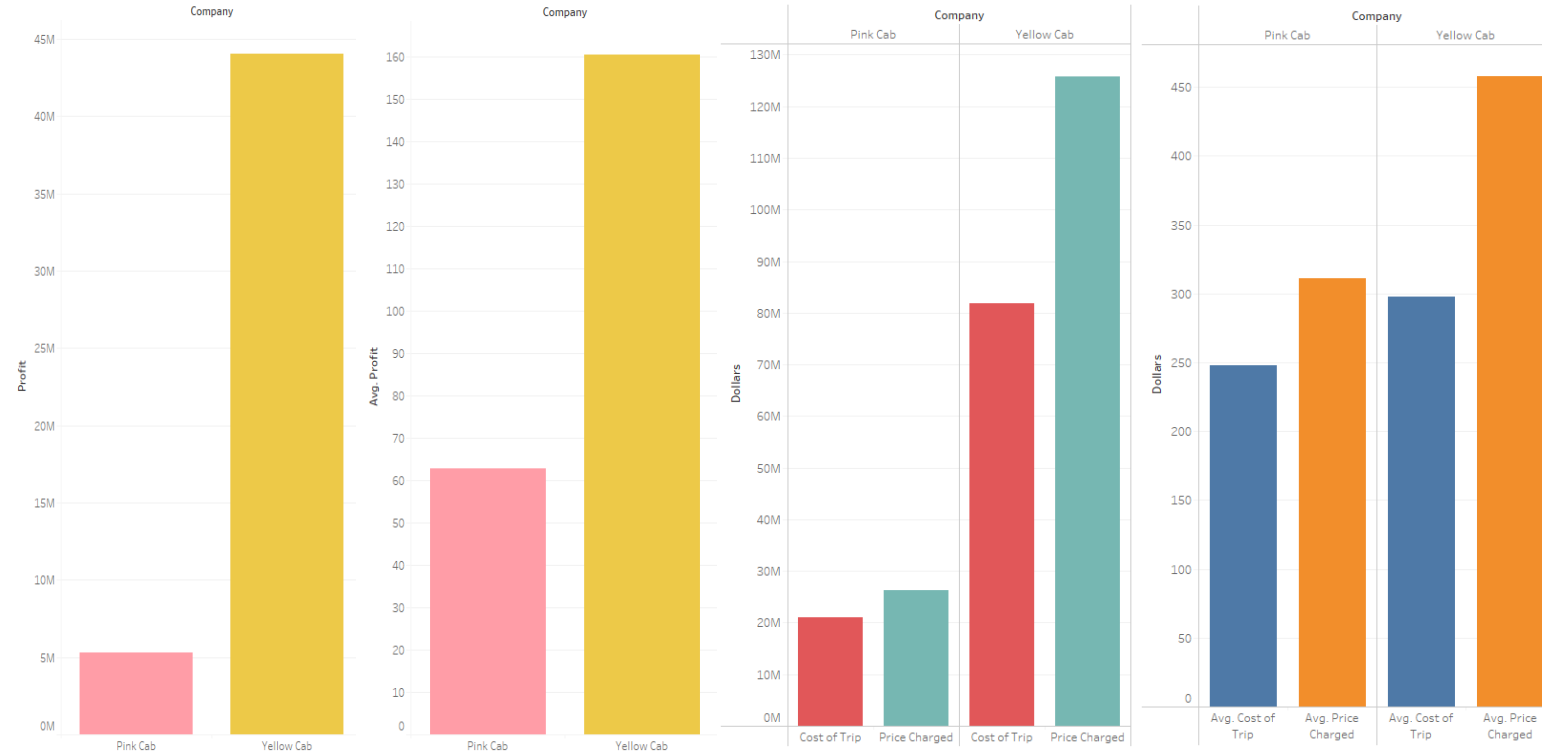
Conclusions:

- The data needed to be cleaned and combined before performing EDA. This was mainly matching the Transaction ID to the transaction.
- The profit of rides was calculated (Profit) keeping other factors constant and only Price Charged and Cost of Trip features used to calculate profit.
- The ratio of population and users in any given city (Ratio) was calculated by dividing Population by Users.
- The Users feature of City.csv dataset is treated as number of cab users in the city. We have assumed that this can be other cab users as well (including Yellow and Pink cab).



Profit Analysis

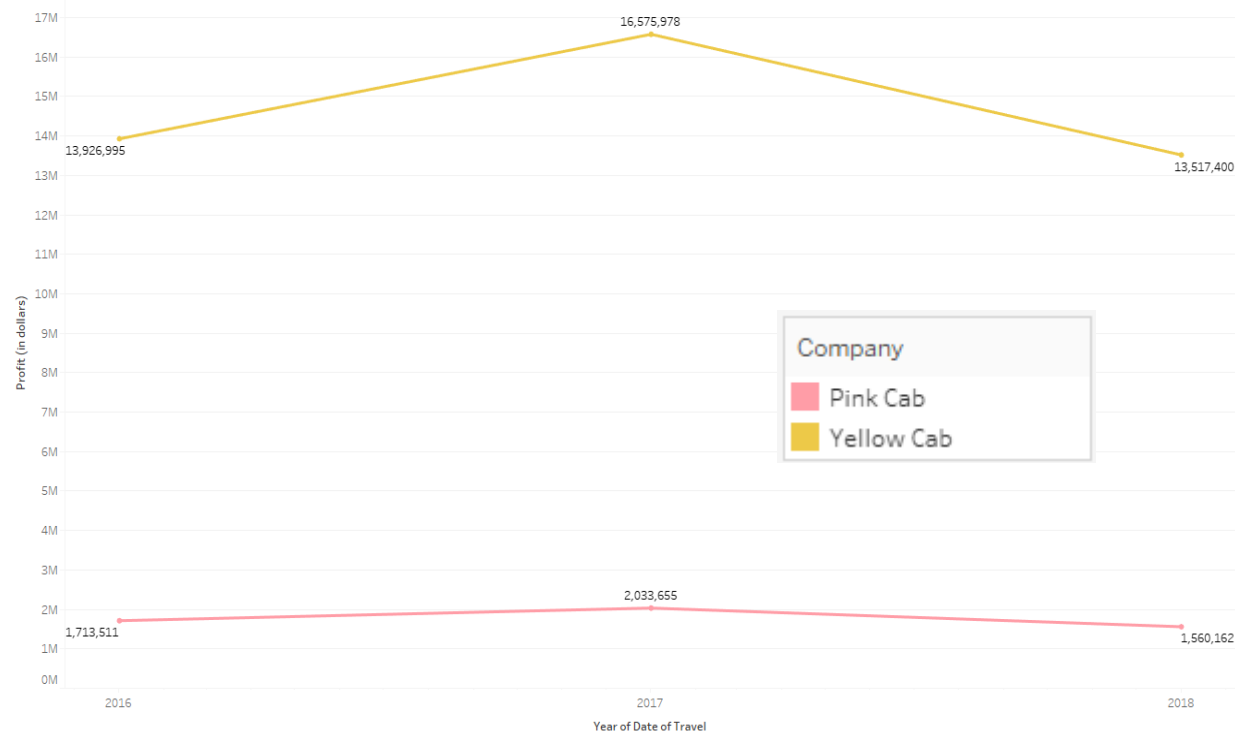
Profit Difference Between The Cab Companies Profit Difference Between The Cab Companies Profit Difference Between The Cab Companies Profit Difference Between The Cab Companies



The Yellow Cab Company makes more total profit and more average profit per transaction than the Pink Cab Company does. This is due to a greater charge price and average charge price. So far Yellow Cab Company seems like a smarter investment.

Profit Analysis By Year

Yearly Profit Between The Cab Companies



Yearly Profit Between The Cab Companies

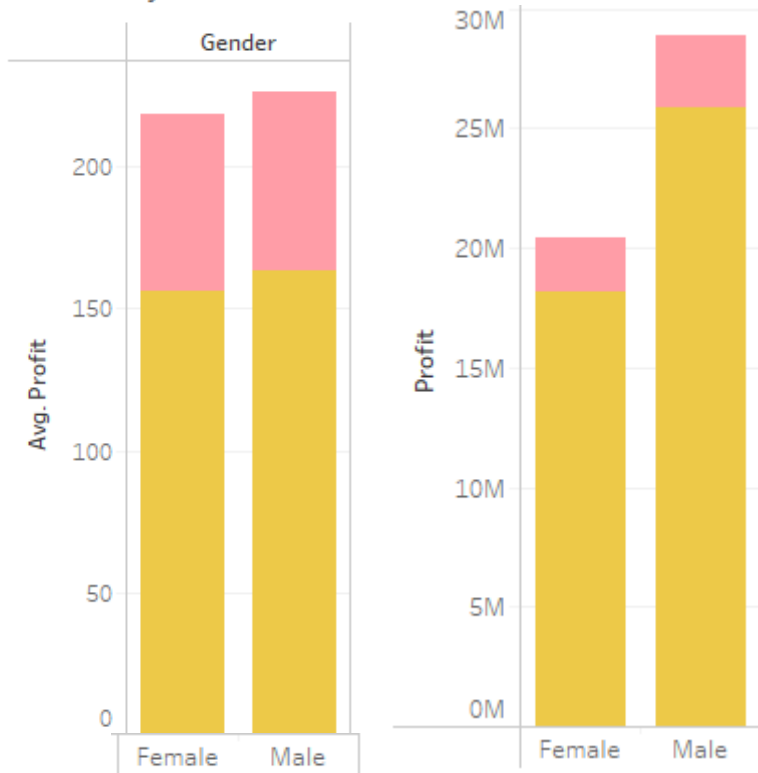
Year of Dat..	Company	Avg. Profit	Profit
2016	Pink Cab	68	1,713,511
	Yellow Cab	169	13,926,995
2017	Pink Cab	67	2,033,655
	Yellow Cab	169	16,575,978
2018	Pink Cab	53	1,560,162
	Yellow Cab	143	13,517,400

Percent Change	Year 1 -> Year 2	Year 2 -> Year 3
Yellow Cab	15.98	-22.63
Pink Cab	15.74	-30.35

The Yellow Cab Company makes significantly more profit than the Pink Cab Company per year, on average. Their prices seem to fluctuate at the same rate year to year as well.

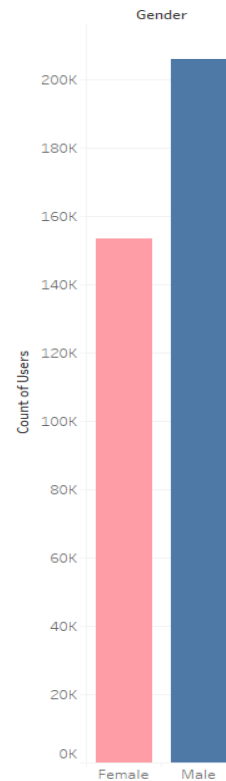
Profit Analysis By Gender

Profit By Gender



Men use the cab companies' services more than women, however, there are no significant differences in the profit margins per transaction by gender.

Users By Gender



Users And Profit Analysis By Monthly Income

Users And Profit By Monthly Income



Users And Average Profit Analysis By Monthly Income

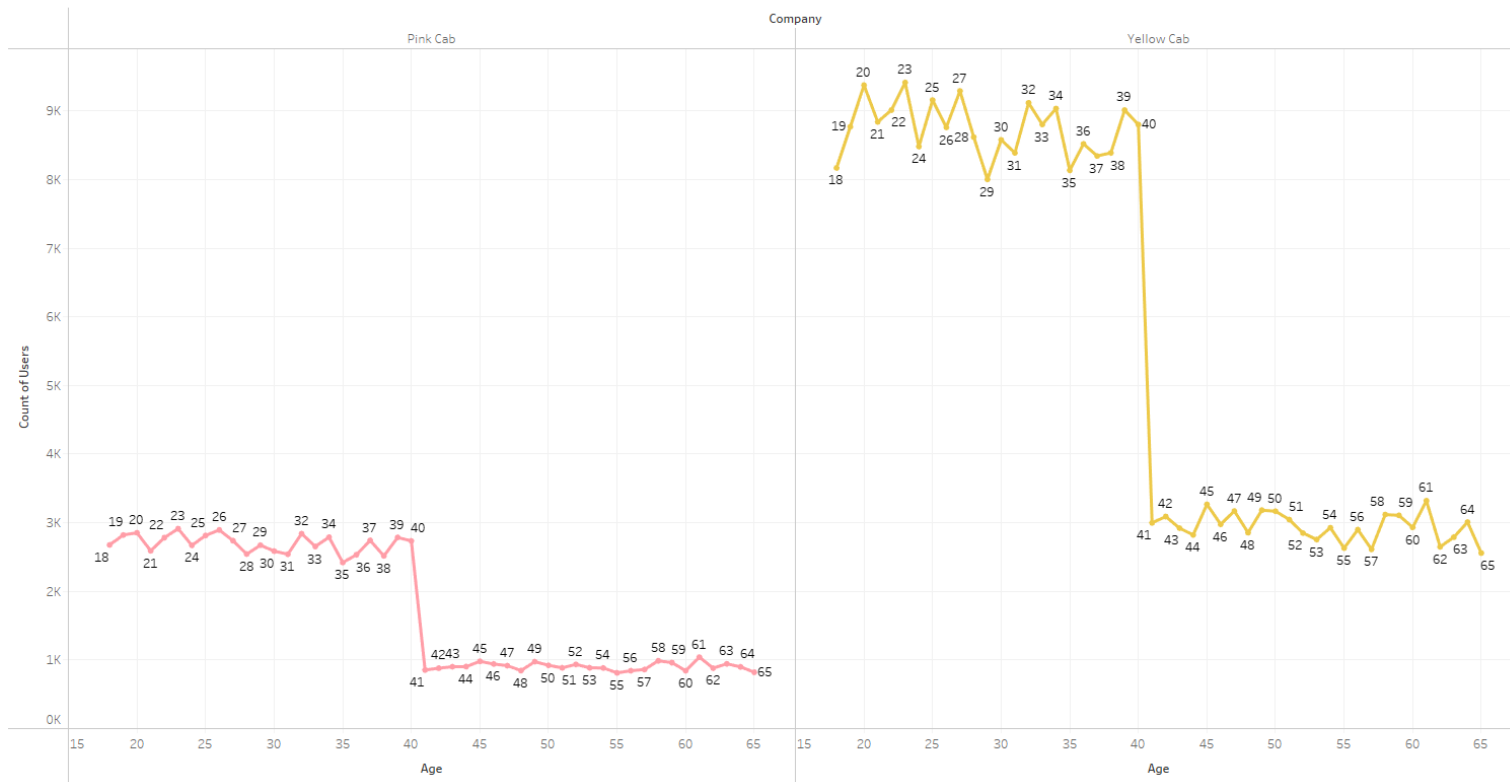
Users And Profit By Monthly Income



Most of the revenue made was between the monthly incomes of \$6,700 and \$24,000 (middle class). Above and below these values are nearly tied in average profit. Although, monthly incomes above \$24,000 generate more total revenue due to more users in this monthly income range. Target cities with a large middle class.

Users Analysis By Age

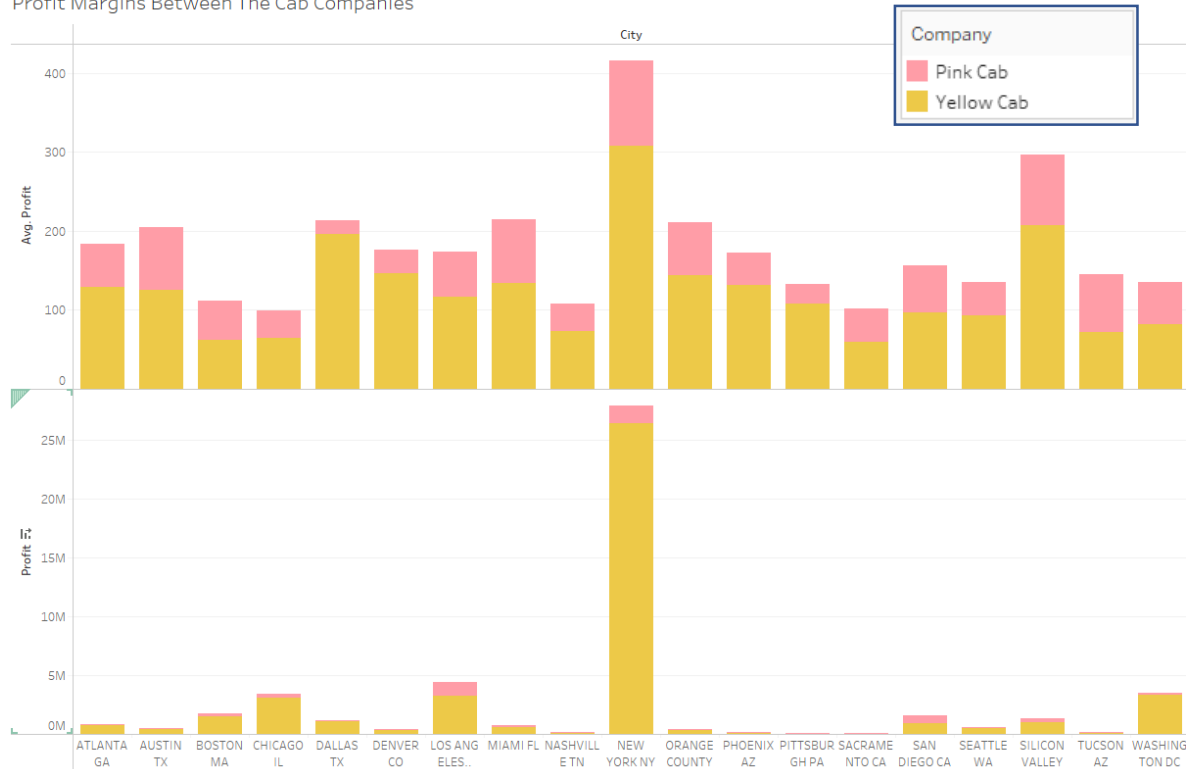
Cab Company By Age (18 - 65)



Both cab companies have a massive drop off in usage once customers enter their 40s, meaning the profit decreases as well. It's best to target cities with a lower average age of population.

Profit Analysis By City

Profit Margins Between The Cab Companies

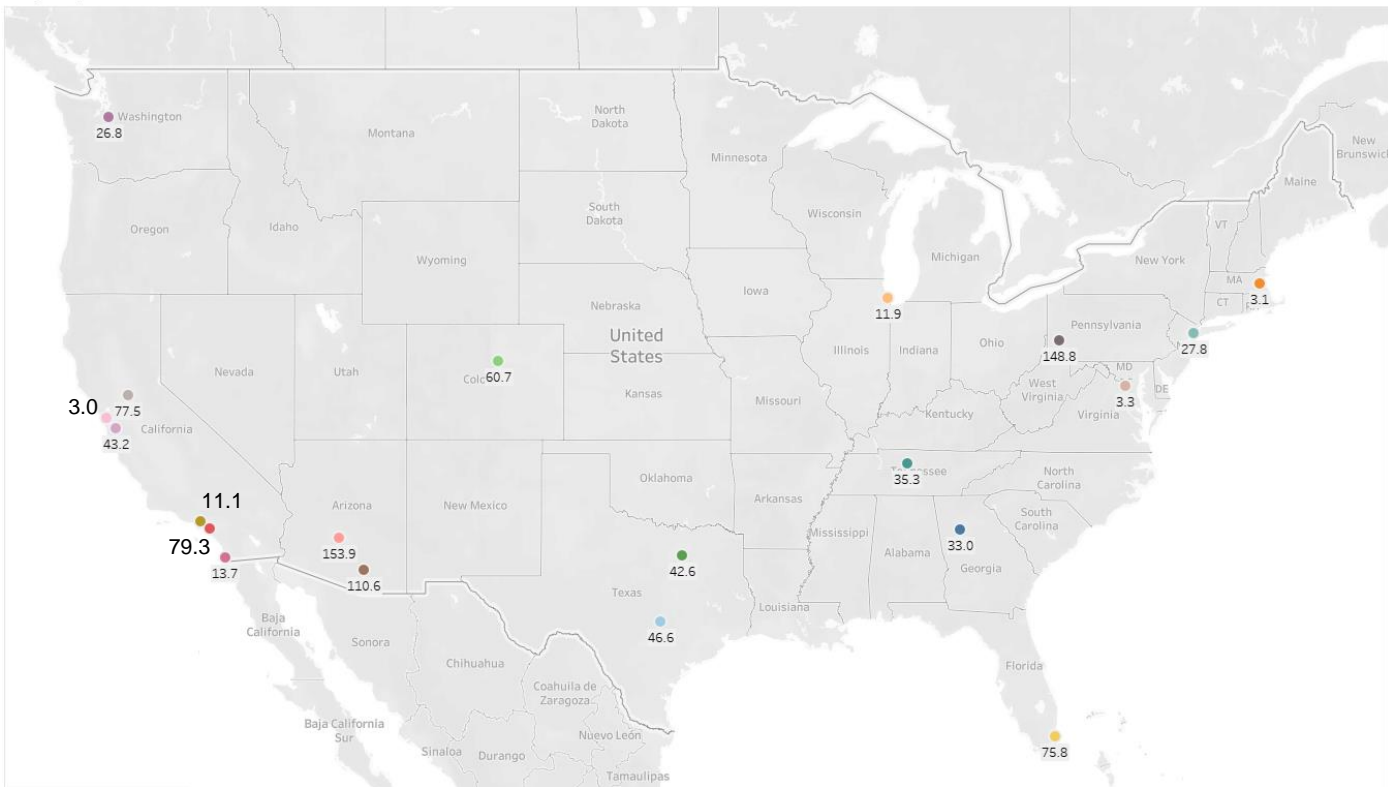


Profit Margins Between The Cab Companies

City	Company		Profit	
	Avg. Profit		Pink Cab	Yellow Cab
ATLANTA GA	55	129	96,050	746,383
AUSTIN TX	79	125	147,445	379,256
BOSTON MA	51	61	262,002	1,506,718
CHICAGO IL	34	65	318,722	3,068,591
DALLAS TX	18	196	24,730	1,104,003
DENVER CO	29	147	40,585	357,000
LOS ANGELES CA	57	117	1,125,732	3,285,977
MIAMI FL	81	134	162,301	596,000
NASHVILLE TN	35	73	64,285	85,248
NEW YORK NY	108	308	1,511,474	26,451,081
ORANGE COUNTY	67	144	101,996	355,006
PHOENIX AZ	41	131	35,596	157,344
PITTSBURGH PA	25	108	17,108	68,058
SACRAMENTO CA	41	60	55,324	62,002
SAN DIEGO CA	60	97	637,890	949,274
SEATTLE WA	41	93	112,781	491,904
SILICON VALLEY	90	207	340,251	976,455
TUCSON AZ	74	72	59,290	80,971
WASHINGTON DC	52	82	193,766	3,299,104

Ratio Of Cab Users Analysis By City

City Population Information



City (City)

- ATLANTA GA
- AUSTIN TX
- BOSTON MA
- CHICAGO IL
- DALLAS TX
- DENVER CO
- LOS ANGELES CA
- MIAMI FL
- NASHVILLE TN
- NEW YORK NY
- ORANGE COUNTY
- PHOENIX AZ
- PITTSBURGH PA
- SACRAMENTO CA
- SAN DIEGO CA
- SAN FRANCISCO CA
- SEATTLE WA
- SILICON VALLEY
- TUCSON AZ
- WASHINGTON DC

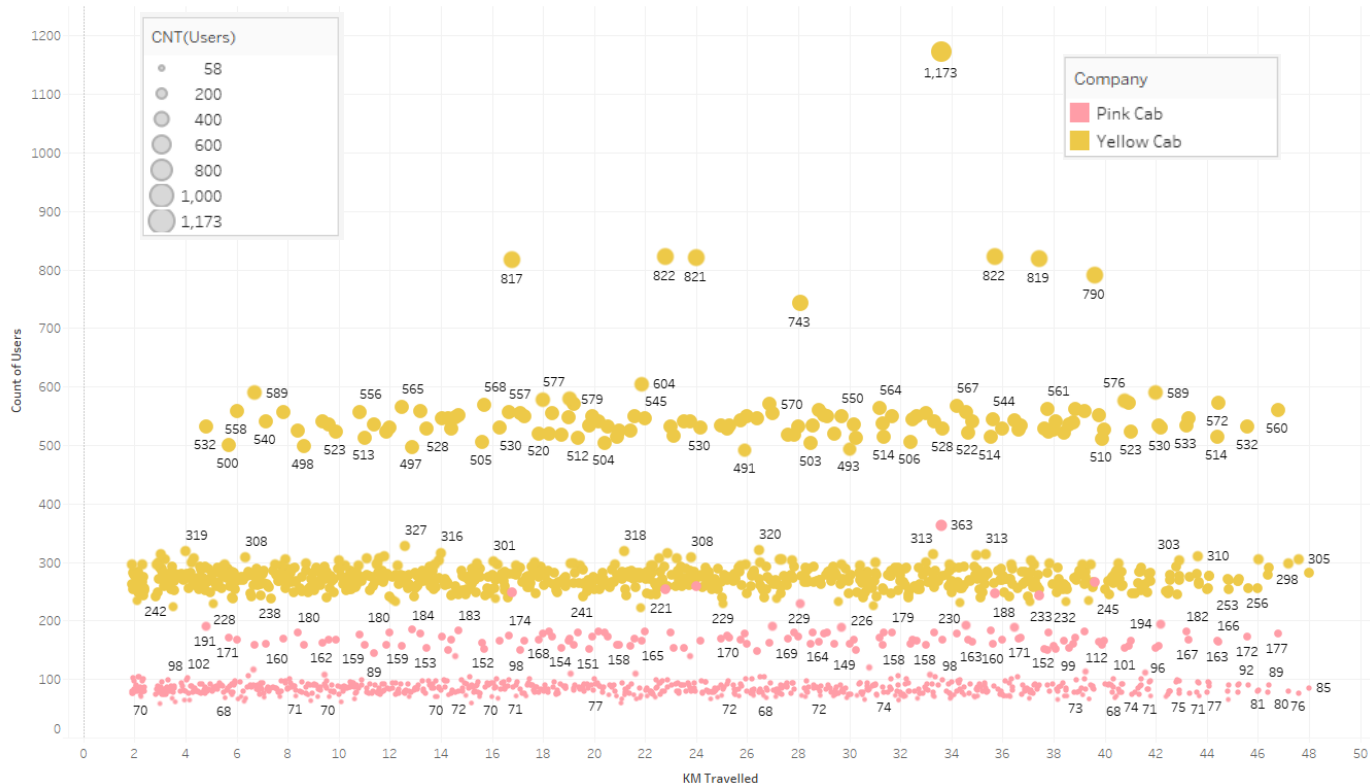
City Population Information

City (City)	Population	Users	Ratio
ATLANTA GA	814,885	24,701	33
AUSTIN TX	698,371	14,978	47
BOSTON MA	248,968	80,021	3
CHICAGO IL	1,955,130	164,468	12
DALLAS TX	942,908	22,157	43
DENVER CO	754,233	12,421	61
LOS ANGELES CA	1,595,037	144,132	11
MIAMI FL	1,339,155	17,675	76
NASHVILLE TN	327,225	9,270	35
NEW YORK NY	8,405,837	302,149	28
ORANGE COUNTY	1,030,185	12,994	79
PHOENIX AZ	943,999	6,133	154
PITTSBURGH PA	542,085	3,643	149
SACRAMENTO CA	545,776	7,044	77
SAN DIEGO CA	959,307	69,995	14
SAN FRANCISCO CA	629,591	213,609	3
SEATTLE WA	671,238	25,063	27
SILICON VALLEY	1,177,609	27,247	43
TUCSON AZ	631,442	5,712	111
WASHINGTON DC	418,859	127,001	3

The lower the number, the more of the population in each city that uses cab services (might not be Yellow or Pink Cab). Thus, lower is better, higher is worse.

Users And Their Distance Travelled Analysis

Users And Their KM Travelled

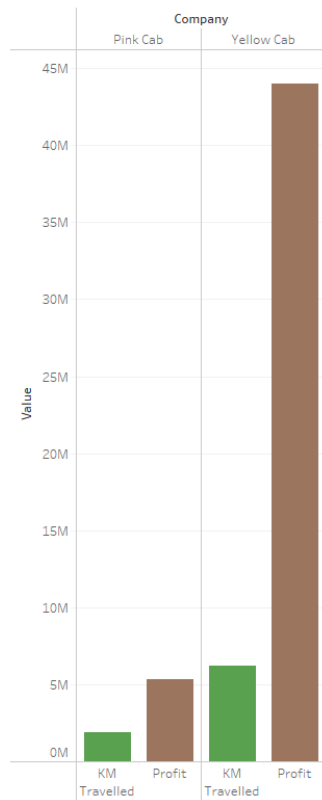


The Yellow Cab Company has nearly equal average customers for short, medium and long rides. The Pink Cab Company has equal average customers for medium rides but they fall off on shorter and longer rides. Rides that are 5-40 KM contribute most of each cab company's users.

On average, there is a difference between the Yellow and Pink Cab Companies in users and KM travelled, the Yellow Cab Company having the higher average in both.

Distance Analysis

KM Travelled With Profit



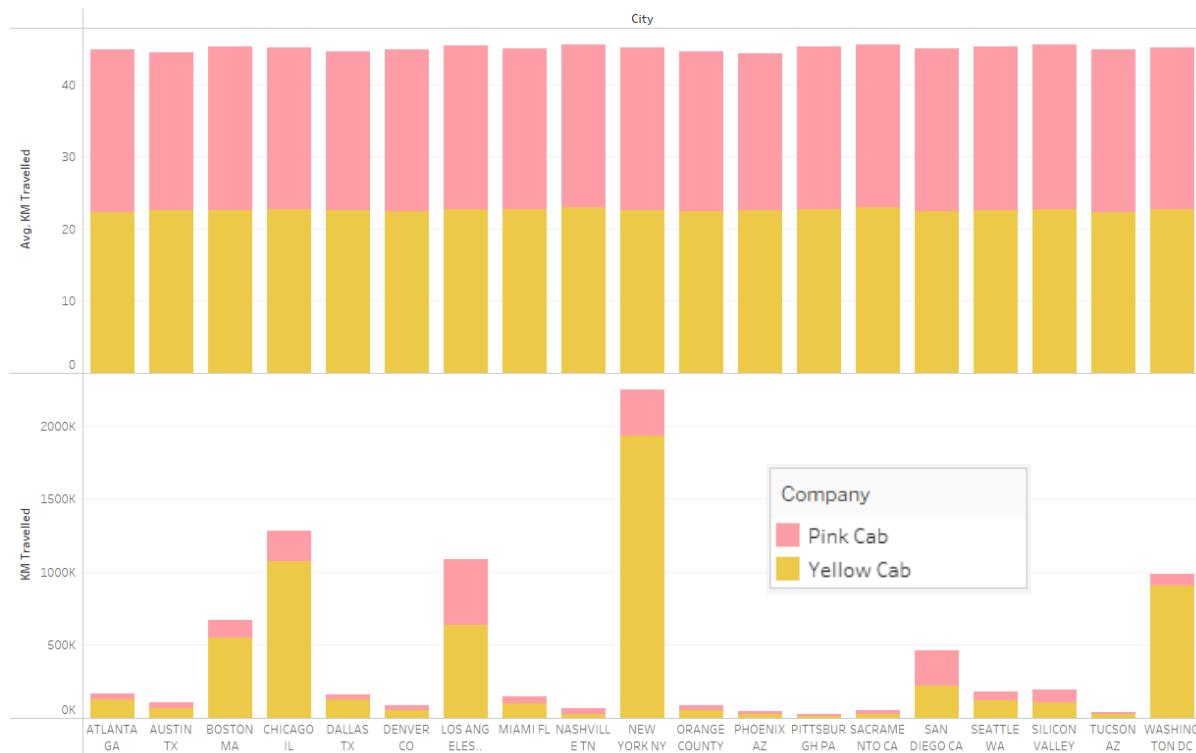
KM Travelled With Profit

Company	KM	
	Travelled	Profit
Pink Cab	1,911,073	5,307,328
Yellow Cab	6,199,417	44,020,373

The Yellow Cab Company has 3x more distance travelled in all their transactions in every city compared to the Pink Cab Company. This result, along with the greater prices, allows for the Yellow Cab Company to have such a large gap in profit compared to the Pink Cab Company.

Distance Analysis By City

Distance Travelled By Company By City



Distance Travelled By Company By City

City	KM Travelled		Avg. KM Travelled	
	Pink Cab	Yellow Cab	Pink Cab	Yellow Cab
ATLANTA GA	39,715	128,929	23	22
AUSTIN TX	41,038	68,169	22	23
BOSTON MA	117,934	552,455	23	23
CHICAGO IL	210,726	1,070,978	23	23
DALLAS TX	30,389	127,393	22	23
DENVER CO	31,308	54,562	22	22
LOS ANGELES CA	449,657	639,079	23	23
MIAMI FL	44,644	100,774	22	23
NASHVILLE TN	41,474	26,851	23	23
NEW YORK NY	315,967	1,932,842	23	22
ORANGE COUNTY	33,609	55,218	22	22
PHOENIX AZ	18,790	27,035	22	23
PITTSBURGH PA	15,401	14,305	23	23
SACRAMENTO CA	30,154	23,707	23	23
SAN DIEGO CA	240,704	219,800	23	22
SEATTLE WA	62,000	118,904	23	23
SILICON VALLEY	86,541	107,172	23	23
TUCSON AZ	18,023	25,207	23	22
WASHINGTON DC	82,999	906,039	22	23

When looking at averages, both companies average about the same distance travelled in each city per ride.

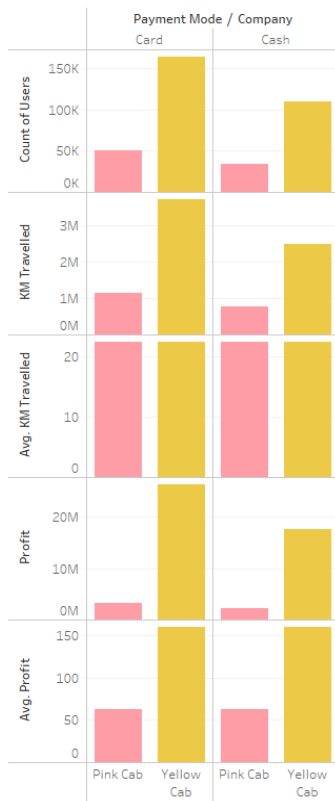
However, the Yellow Cab Company has more KM travelled in 15 out of 19 cities.

Distance Travelled By Company

KM Travelled		Avg. KM Travelled	
Pink Cab	Yellow Cab	Pink Cab	Yellow Cab
1,911,073	6,199,417	23	23

Payment Method Analysis By City

Payment Method



Payment Method

Company		Payment Mode	
		Card	Cash
Pink Cab	Count of Users	50,719	33,992
	KM Travelled	1,145,807	765,266
	Avg. KM Travelled	23	23
	Profit	3,180,603	2,126,726
	Avg. Profit	63	63
Yellow Cab	Count of Users	164,785	109,896
	KM Travelled	3,719,176	2,480,241
	Avg. KM Travelled	23	23
	Profit	26,362,078	17,658,295
	Avg. Profit	160	161

On average, customers who pay with cards travel similarly to customers who pay with cash, for both companies. The same could be said about average profit, as the cab companies receive the same relative revenue whether card or cash is used. The only significant finding is that customers use cards statistically significantly more than customers who pay with cash.

City Covered By Company Analysis

Total Cities			4/19 Pink>								
Row Labels	Count of City	1,076,804	15/19 Yellow>								
Pink Cab	84711	0.08									
Yellow Cab	274681	0.26									
Grand Total	359392	0.33									
Atlanta GA	24,701	Yellow	Denver CO	12,421	Yellow	Orange County	12,994	Yellow	Seattle WA	25,063	Yellow
Pink Cab	1762	0.07	Pink Cab	1394	0.11	Pink Cab	1513	0.12	Pink Cab	2732	0.11
Yellow Cab	5795	0.23	Yellow Cab	2431	0.20	Yellow Cab	2469	0.19	Yellow Cab	5265	0.21
Grand Total	7557	0.31	Grand Total	3825	0.31	Grand Total	3982	0.31	Grand Total	7997	0.32
Austin TX	14,978	Yellow	Los Angeles CA	144,132	Yellow	Pheniox AZ	6,133	Yellow	Silicon Valley	27,247	Yellow
Pink Cab	1868	0.12	Pink Cab	19865	0.14	Pink Cab	864	0.14	Pink Cab	3797	0.14
Yellow Cab	3028	0.20	Yellow Cab	28168	0.20	Yellow Cab	1200	0.20	Yellow Cab	4722	0.17
Grand Total	4896	0.33	Grand Total	48033	0.33	Grand Total	2064	0.34	Grand Total	8519	0.31
Boston MA	80,021	Yellow	Miami FL	17,675	Yellow	Pittsburgh PA	3,643	Pink	Tuscon AZ	5,712	Yellow
Pink Cab	5186	0.06	Pink Cab	2002	0.11	Pink Cab	682	0.19	Pink Cab	799	0.14
Yellow Cab	24506	0.31	Yellow Cab	4452	0.25	Yellow Cab	631	0.17	Yellow Cab	1132	0.20
Grand Total	29692	0.37	Grand Total	6454	0.37	Grand Total	1313	0.36	Grand Total	1931	0.34
Chicago IL	164,468	Yellow	Nashville TN	9,270	Pink	Sacramento CA	7,044	Pink	Washington DC	127,001	Yellow
Pink Cab	9361	0.06	Pink Cab	1841	0.20	Pink Cab	1334	0.19	Pink Cab	3692	0.03
Yellow Cab	47264	0.29	Yellow Cab	1169	0.13	Yellow Cab	1033	0.15	Yellow Cab	40045	0.32
Grand Total	56625	0.34	Grand Total	3010	0.32	Grand Total	2367	0.34	Grand Total	43737	0.34
Dallas TX	22,157	Yellow	New York NY	302,149	Yellow	San Diego CA	69,995	Pink			
Pink Cab	1380	0.06	Pink Cab	13967	0.05	Pink Cab	10672	0.15			
Yellow Cab	5637	0.25	Yellow Cab	85918	0.28	Yellow Cab	9816	0.14			
Grand Total	7017	0.32	Grand Total	99885	0.33	Grand Total	20488	0.29			

This is the number of users covered by the Yellow and Pink Cab Companies in each city against all cab users in each city. Both companies combine to average about 33% of the service in every city.

The Yellow Cab Company averages about 26% of the share of coverage in every city while the Pink Cab Company only averages about 8% of the share in each city. However, the Pink Cab Company does cover more users in 4 of the 19 cities we are analysing (Nashville, Pittsburgh, Sacramento, and San Diego). This also tells us there is lots of competition in these cities for cab companies.

Recommendations

I have evaluated both the cab companies and found the Yellow Cab Company better than the Pink Cab Company, here is my reasoning:

- **Total Profits:** The Yellow Cab Company earns more than 2.5 times the profit of the Pink Cab Company. In fact, they earn more in 18 out of the 19 cities from the dataset (Tucson AZ, Pink Cab Company earns about \$74.20 per trip and the Yellow Cab Company earns about \$71.53 per trip). The Yellow Cab Company also projects to earn more than the Pink Cab Company, showing no signs of steep drop off.
- **Age Matters:** The Yellow Cab Company has more customers in all age groups. Despite a big drop off, it's more popular in the 41+ age group than the Pink Cab Company is in the 18-40 age group. It's still best to target cities with a lower age of population.
- **Average Profit per KM:** When looking at averages, both companies average about the same distance travelled in each city per ride. However, the Yellow Cab Company has more KM travelled in 15 out of 19 cities. The Yellow Cab Company's average profit per KM is almost 3 times the average profit per KM of the Pink Cab Company.
- **Monthly Income Results:** The Yellow Cab Company performed better than the Pink Cab Company in offering their services to all three income classes (lower, middle and upper). They had a higher average profit and total profit margin for each income class, and a much higher user count for these three classes. Target cities with a large middle class as that is where most of the profit is generated.
- **Other Variables:** Some features that I researched, like payment method and gender, showed little to no significance to the profit margins of the two cab companies.

As per the point above, I will recommend the Yellow Cab Company for investment.

Thank You



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