Who are the "tough guys" against the Covid-19 effects?

— Based on Yelp dataset

Group Red

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Agenda

1. Introduction
2. Assumption
3. SQL coding and business insight of Number of Reviews
4. SQL coding and business insight of Avg Stars
5. Visual results and business insight

Introduction - COVID and Business Ratings

- The unanticipated restrictions and measures put into play during the COVID-19 pandemic had significant impacts on businesses.

- This project aims to gauge the business impact of lockdown measures on businesses by analyzing the ratings

- We have considered data from **15 March 2020** as this was the beginning of lockdown measures in the USA.

SQL Code for Number of Reviews

Before COVID-19

```
CREATE OR REPLACE VIEW before_covid AS
SELECT category_name, count(*) AS total_reviews_before
FROM review
INNER JOIN business USING (business_id)
INNER JOIN category USING (business_id)
WHERE Category_name in ('Active Life', 'Arts & Entertainment', 'Automotive', 'Beauty & Spas', 'Education',
'Event Planning & Services', 'Financial Services', 'Food', 'Health & Medical', 'Home Services', 'Hotels & Travel',
'Local Flavor', 'Local Services', 'Mass Media', 'Nightlife', 'Pets', 'Professional Services', 'Public Services &
Government', 'Real Estate', 'Religious Organizations', 'Restaurants', 'Shopping')
and review_date > '2018-5-10' and review_date <= '2020-3-15'
GROUP BY category_name
ORDER BY total_reviews_before DESC;
```

SQL Code for Number of Reviews

Before COVID-19

	CATEGORY_NAME ...	TOTAL_REVIEWS_BEFORE
1	Restaurants	1,112,876
2	Food	427,185
3	Nightlife	370,989
4	Event Planning & Services	144,569
5	Shopping	113,937
6	Beauty & Spas	96,005
7	Arts & Entertainment	78,589
8	Hotels & Travel	76,267
9	Home Services	63,579
10	Automotive	58,910
11	Health & Medical	51,504
12	Local Services	49,303
13	Active Life	49,039
14	Local Flavor	27,228
15	Pets	18,555
16	Real Estate	15,156
17	Professional Services	14,312
18	Education	8,471
19	Public Services & Government	8,064
20	Financial Services	5,697

SQL Code for Number of Reviews

After COVID-19

```
CREATE OR REPLACE VIEW after_covid AS
SELECT category_name, count(*) AS total_reviews_after
FROM review
INNER JOIN business USING (business_id)
INNER JOIN category USING (business_id)
WHERE Category_name in ('Active Life', 'Arts & Entertainment', 'Automotive', 'Beauty & Spas', 'Education',
'Event Planning & Services', 'Financial Services', 'Food', 'Health & Medical', 'Home Services', 'Hotels & Travel',
'Local Flavor', 'Local Services', 'Mass Media', 'Nightlife', 'Pets', 'Professional Services', 'Public Services &
Government', 'Real Estate', 'Religious Organizations', 'Restaurants', 'Shopping')
and review_date > '2020-3-15' and review_date <= '2022-1-19'
GROUP BY category_name
ORDER BY total_reviews_after DESC;
```

SQL Code for Number of Reviews

After COVID-19

	CATEGORY_NAME	...	TOTAL_REVIEWS_AFTER
1	Restaurants		675,048
2	Food		274,652
3	Nightlife		206,064
4	Shopping		80,539
5	Event Planning & Services		79,109
6	Home Services		54,322
7	Beauty & Spas		54,275
8	Automotive		44,714
9	Local Services		39,619
10	Hotels & Travel		38,682
11	Arts & Entertainment		35,396
12	Health & Medical		34,601
13	Active Life		28,378
14	Pets		15,048
15	Local Flavor		12,161
16	Real Estate		11,521
17	Professional Services		9,969
18	Education		4,726
19	Public Services & Government		4,709
20	Financial Services		4,647

SQL Code for Number of Reviews

Increasement between before and after COVID-19

SELECT category_name, total_reviews_before, total_reviews_after, (total_reviews_after -
total_reviews_before)/total_reviews_before AS increasement_reviews
FROM before_covid
INNER JOIN after_covid a USING (category_name)
ORDER BY increasement_reviews DESC;

SQL Code for Number of Reviews

CATEGORY_NAME	TOTAL_REVIEWS_BEFORE	TOTAL_REVIEWS_AFTER	INCREASEMENT_REVIEWS
Home Services	63579	54322	-0.145598
Financial Services	5697	4647	-0.184308
Pets	18555	15048	-0.189006
Local Services	49303	39619	-0.196418
Real Estate	15156	11521	-0.239839
Automotive	58910	44714	-0.240978
Mass Media	606	440	-0.273927
Shopping	113937	80539	-0.293127
Professional Services	14312	9969	-0.303452
Health & Medical	51504	34601	-0.328188
Food	427185	274652	-0.357065
Restaurants	1112876	675048	-0.393420
Public Services & Government	8064	4709	-0.416047
Active Life	49039	28378	-0.421318
Beauty & Spas	96005	54275	-0.434665
Education	8471	4726	-0.442097
Nightlife	370989	206064	-0.444555
Event Planning & Services	144569	79109	-0.452794
Hotels & Travel	76267	38682	-0.492808
Religious Organizations	1143	536	-0.531059
Arts & Entertainment	78589	35396	-0.549606
Local Flavor	27228	12161	-0.553364

SQL Code for Number of Reviews Analysis

- Home services category get affected the least (the increment is -0.15)
- Local flavor category get affected the most (the increment is -0.55)
- We can tell that the demand for the home services, financial services, pet is similar before and after the COVID.

Home Services	63579	54322	-0.145598
Financial Services	5697	4647	-0.184308
Pets	18555	15048	-0.189006
Local Services	49303	39619	-0.196418

Hotels & Travel	70207	36662	-0.492606
Religious Organizations	1143	536	-0.531059
Arts & Entertainment	78589	35396	-0.549606
Local Flavor	27228	12161	-0.553364

SQL - Ratings

- Which business types/industries were most resilient against COVID's effects in terms of their ratings?

- Which business types/industries were least resilient against COVID's effects in terms of their ratings?

- What's the overall effect of COVID on reviews across all business types/industries?

SQL - Ratings

- Top 3 rating increases

- Top 3 rating decreases

- When there are increases, they are generally pretty small

- When there are decreases, they are much larger in magnitude

Category	Rating Before	Rating After	Rating Change
Nightlife	3.86	3.90	.04
Restaurants	3.84	3.85	.01
Arts & Entertainment	3.84	3.84	0
…	…	…	…
Health & Medical	3.61	3.31	-.30
Pets	3.84	3.52	-.33
Mass Media	2.92	2.30	-.62

SQL - Ratings

- The large majority of categories saw decreases in their average ratings

- Any increases that occurred were very small

- We should a better understanding when we compare to the 'Number of Reviews' results from before

Category	Rating Change
Nightlife	0.04
Restaurants	0.01
Arts & Entertainment	0
Food	-0.01
Event Planning & Services	-0.04
Automotive	-0.05
Professional Services	-0.06
Local Services	-0.06
Local Flavor	-0.07
Home Services	-0.07
Beauty & Spas	-0.09
Education	-0.12
Active Life	-0.15
Religious Organizations	-0.17
Shopping	-0.18
Hotels & Travel	-0.20
Financial Services	-0.20
Real Estate	-0.24
Public Services & Government	-0.28
Health & Medical	-0.30
Pets	-0.33
Mass Media	-0.62

SQL - Ratings

- A few implications from our query results:

  - **Nightlife, Restaurants, and Arts/Entertainment** businesses seemed to be the most resilient to the lockdown in terms of their ratings

    - Even then, the gains in ratings were **very miniscule**

  - **Health, Pets, and Mass Media** ratings were most negatively affected among the categories

    - Where most categories observed negligible rating changes, these businesses saw **massive drops** in their average ratings
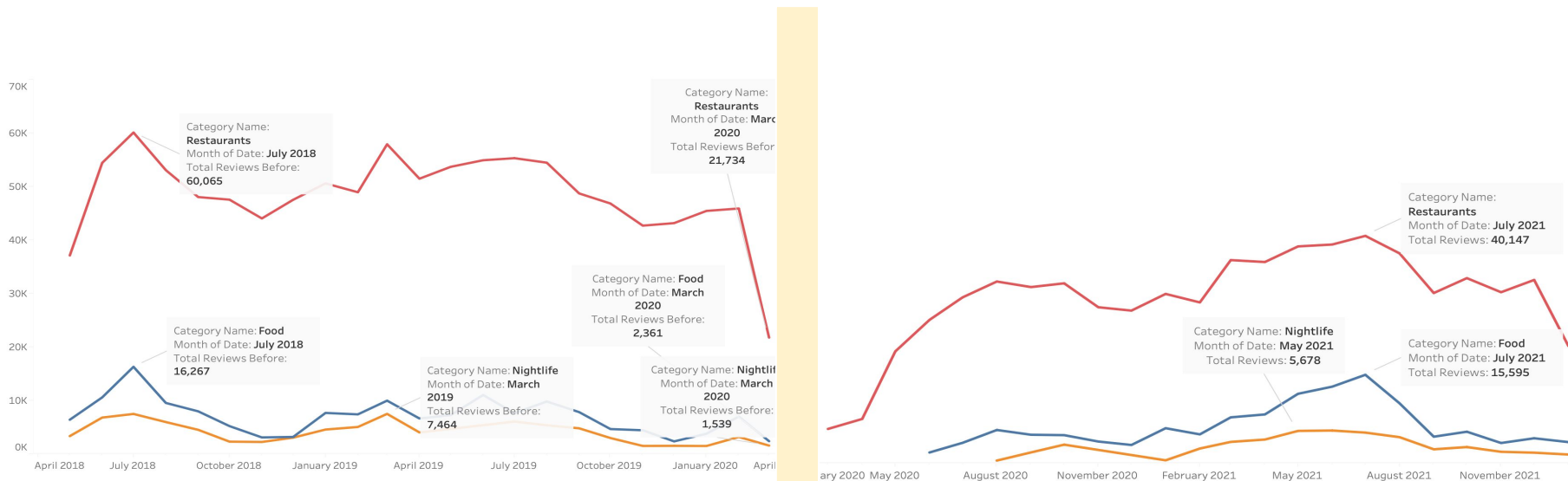
SQL

- Some caveats to this analysis:

    - Incomplete dataset
        - Many states are missing leaving us with only a portion of actual reviews

    - Too many factors
        - Dataset covers too few dimensions/features to garner a complete understanding of the effects of the COVID lockdown

Total number of Reviews before and after Covid-19

Category Name:
Restaurants
Month of Date: July 2018
Total Reviews Before:
60,065

Category Name:
Restaurants
Month of Date: March 2020
Total Reviews Before:
21,734

Category Name: Restaurants
Month of Date: July 2021
Total Reviews: 40,147

Category Name: Food
Month of Date: July 2018
Total Reviews Before:
16,267

Category Name: Food
Month of Date: March 2020
Total Reviews Before:
2,361

Category Name: Nightlife
Month of Date: March 2019
Total Reviews Before:
7,464

Category Name: Nightlife
Month of Date: March 2020
Total Reviews Before:
1,539

Category Name: Nightlife
Month of Date: May 2021
Total Reviews: 5,678

Category Name: Food
Month of Date: July 2021
Total Reviews: 15,595

Lockdown starts

Average stars before and after Covid-19