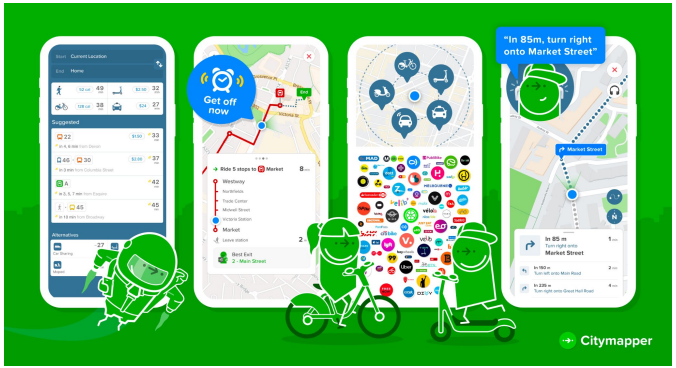
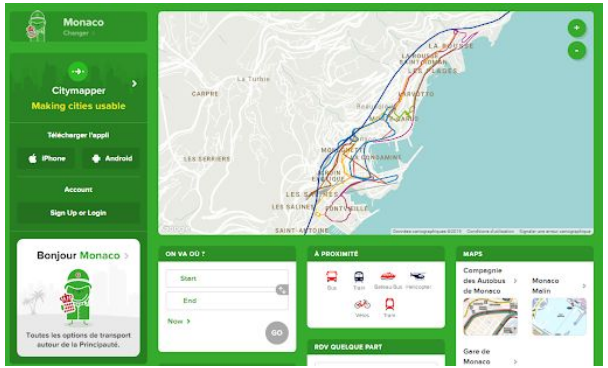
Citymapper Mobility Index
Lockdown Impact

Background Information

What is Citymapper?

- **Citymapper** is a public transit app and mapping service.
  - Displays transport options, usually with live timing, between any two locations in a supported city.
  - It integrates data from all urban modes of transport.
  - It is supported by an Internet Website and a mobile App.

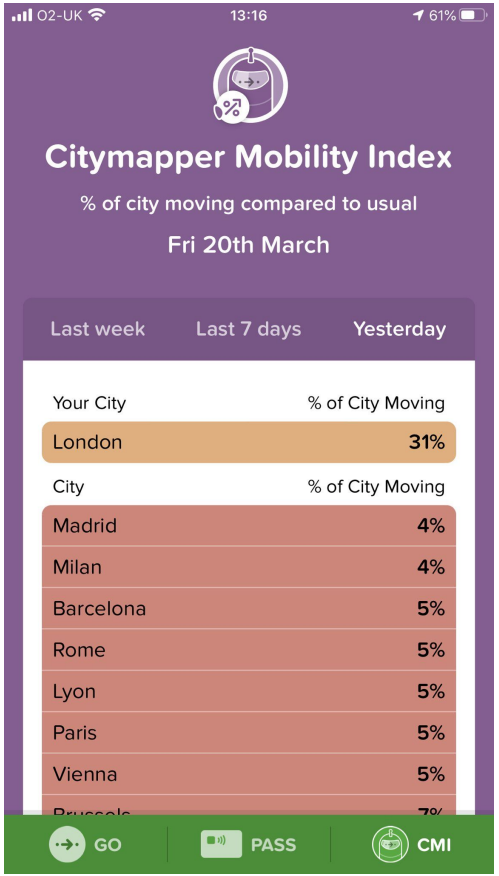




Background Information

About the Citymapper Mobility Index

- Calculated by comparing trips planned in the Citymapper app to a recent '*typical usage period.*'
  - **Typical Usage Period**
    - Most cities : Jan 6th to Feb 2nd 2020
    - Paris : Feb 3rd to March 1st 2020
    - Hong Kong and Singapore : Dec 2nd to Dec 22nd 2019.
  - **Calculated by day:** Midnight to Midnight UTC
    - Possibility that for certains cities it may no correspond with the calendar days (Ex. Melbourne vs. London)
  - **Mobilities taken into account:**
    - Public transport, walking cycling, some micro-mobility, cabs.



Background Information

Monitoring Points

- The Citymapper index takes only into account the users of the 'Citymapper' application.
- The index takes only into account the 'formal public transport'.
- As previously explained, the period of comparaison is not the same for all the cities.
- There are some inconsistencies in the dates due to the time difference between the cities (UTC as referential).

Dataset Information

Citymapper Index Dataset

- Downloaded from KAGGLE.
- 134 rows = 134 days
  - From January 20th to June 1st 2020
- 42 columns = 42 cities
  - 13 America cities : mostly USA
  - 23 Europe : Western Europe
  - 5 Asia

	Date	Amsterdam	Barcelona	Berlin	Birmingham	Boston	Brussels	Chicago	Copenhagen	Hamburg	...	Singapore
0	2020-01-20	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN
1	2020-01-21	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN
2	2020-01-22	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN
3	2020-01-23	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN
4	2020-01-24	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN
...	...	...	...	...	...	...	...	...	...	...	...	...
129	2020-05-28	0.13	0.17	0.29	0.17	0.08	0.22	0.08	0.27	0.32	...	0.14
130	2020-05-29	0.13	0.17	0.29	0.17	0.08	0.21	0.09	0.25	0.28	...	0.15
131	2020-05-30	0.13	0.21	0.31	0.20	0.11	0.23	0.12	0.21	0.32	...	0.18
132	2020-05-31	0.13	0.19	0.32	0.26	0.15	0.22	0.12	0.20	0.30	...	0.18
133	2020-06-01	0.17	0.21	0.36	0.19	0.11	0.24	0.09	0.23	0.37	...	0.18

Dataset Information

COVID-19 Lockdown dates by Country

- Downloaded from KAGGLE.
- Data given in terms of country and regions.
- 2 useful informations:
  - Type of Lockdown: Full, Partial or None.
  - Lockdown Start Date.
- Manually cleaned in Excel, as it couldn't be done in Python:
  - We needed to make coincide each city that we had in the Citymapper dataset with the correspondent Lockdown Country/Region.

Canada	Alberta	17/03/2020	Full	https://en.wikipe .org/wiki/2020_co avirus_pandemic_i anada
Canada	British Columbia	18/03/2020	Full	https://en.wikipe .org/wiki/2020_co avirus_pandemic_i anada
Canada	Manitoba	20/03/2020	Full	https://en.wikipe .org/wiki/2020_co avirus_pandemic_i anada
Canada	New Brunswick	19/03/2020	Full	https://en.wikipe .org/wiki/2020_co avirus_pandemic_i anada
Canada	Newfoundland and Labrador	18/03/2020	Full	https://en.wikipe .org/wiki/2020_co avirus_pandemic_i anada
Canada	Northwest Territories	18/03/2020	Partial	https://en.wikipe

Data Cleaning Process

First Look at the Data

- **Citymapper Index Dataset:** Cleaning (delete NaN, transpose the dataset and change the days in columns, change the datatype of the column titles into 'date' format.
- **COVID-19 Lockdown Dataset:** Cleaning (Delete unnecessary rows = rows from Countries/Region that were not in our Citymapper Index Dataset)

Data selection

- **Selected month:** first month of the pandemic (from 3 March 2020 to 31 march 2020))
- **Representativity:** Selection of one city from one country from one continent(except Africa)

Basics Statistics

We use the .describe() fonction to get the basic descriptive statistics (mean, avg, max, min, count)

Outliers

We used the box plots to detect the possible outliers in our datasets.
We did not deleted them because we were interested in those cities for our analysis.

Some Descriptive Statistics

Barplot of total index/cities in march 2020

Observations

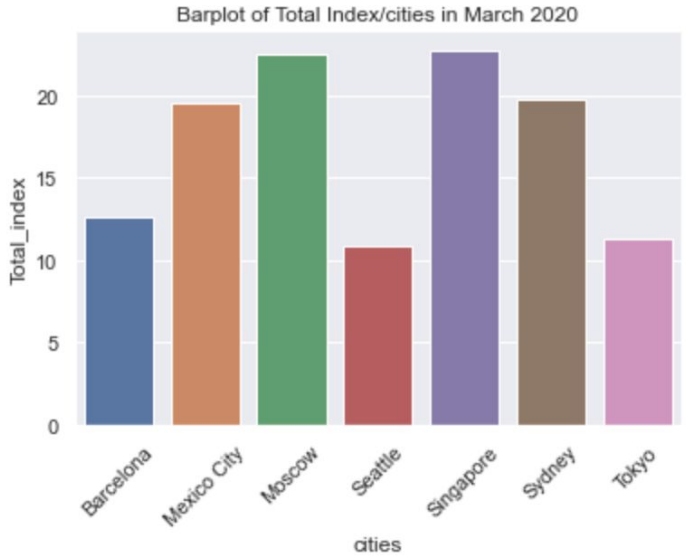
High Citymapper mobility ratio in Moscow and Singapore

Lower Citymapper mobility ratio in Tokyo, Seattle and Barcelona (<15)

Hypothesis

High ratio according to the demography (Moscow, Mexico City, Singapore)

or lockdown type (full lockdown in Sydney)



Some Descriptive Statistics (2)

Boxplot of the 7 cities indexes per date in March 2020

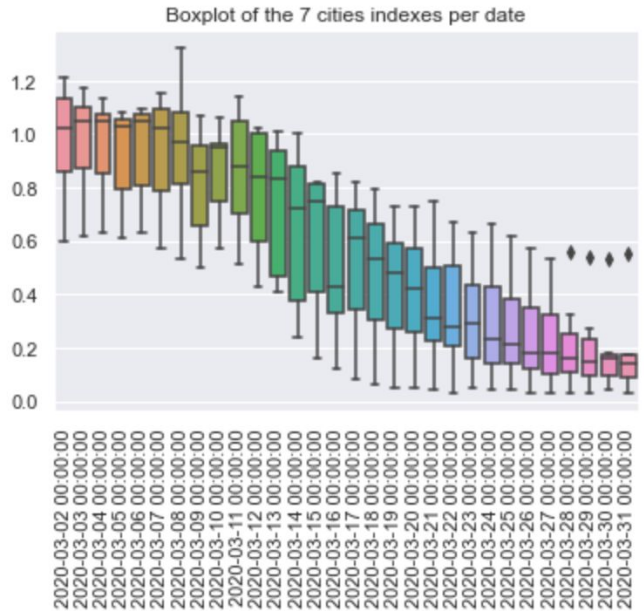
Observations

Drastic decline of the indexes throughout the month (mean, maximum values, minimum values, quartiles,...)

Some outliers (4) at the end of the month

Hypothesis

Number of COVID cases increased throughout the month



Some Descriptive Statistics (3)

Data visualisation of Total index/Lockdown type

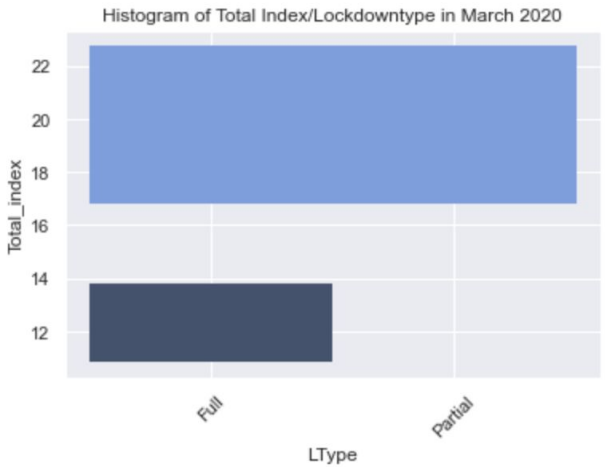
Observations

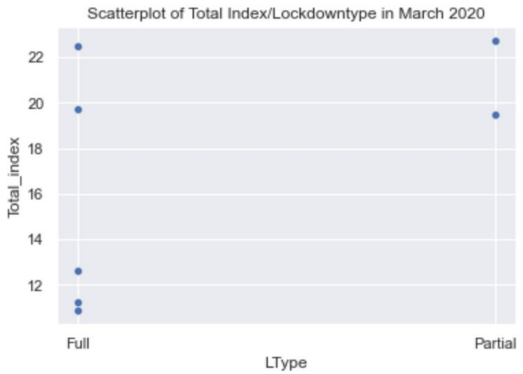
Higher ratio when the lockdown was partial (2/2 cities)

Lower ratio when the lockdown was full (⅗ cities)

Hypothesis

Easier to travel with a partial lockdown





Going Further

- Comparaison Capital Cities vs. Secondary ones.
- Add to the database some socioeconomic information:
  - The mobile phone rate coverage of the population.
  - The informal transport rate.
  - The level of income.
  - The share of the population with a car.
  - The percentage of the cities covered by the public transport.
  - The predominant economic sector by city.