



# BUSINESS INTELLIGENCE

## GROUP 1

Quach Cong Tuan  
Nguyen Lam Khanh  
Pham Ngoc Long  
Nguyen Tuan Minh

# TABLE OF CONTENT



**P3**

BI introduction

**P4**

Dataset  
preparation

**M3**

UI design

# P3: BI INTRODUCTION

# ABOUT BI

## 1. What is BI?

Business intelligence (BI) leverages software and services to transform data into actionable insights that inform an organization's strategic and tactical business decisions. BI tools access and analyze data sets and present analytical findings in reports, summaries, dashboards, graphs, charts and maps to provide users with detailed intelligence about the state of the business.





Report



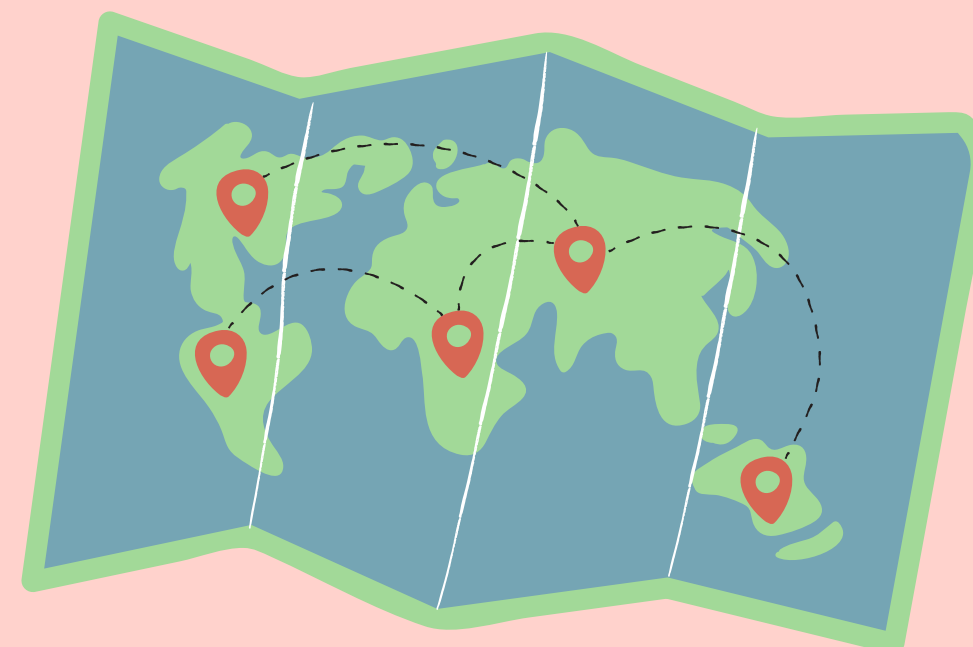
Summary



Dashboard

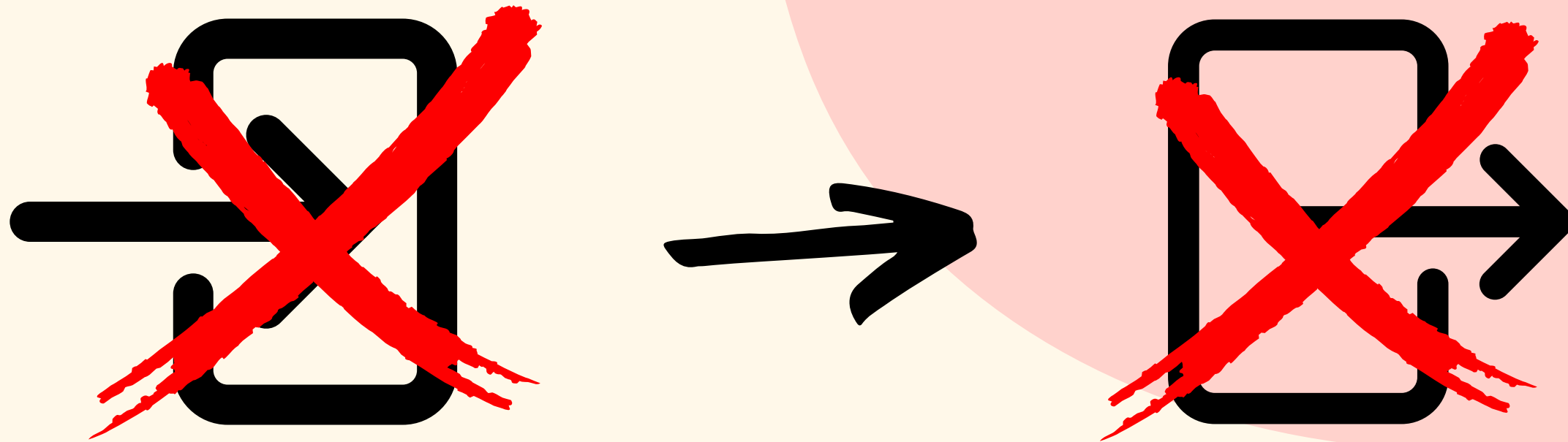


Chart/Graph



Map

## 1. What is BI?



=> BI attempts to solve this problem by analyzing current data that is ideally presented on a dashboard of quick metrics designed to support better decisions. ✓

## 2. Why is business intelligence important?

Business intelligence can help companies make better decisions by showing present and historical data within their business context. Analysts can leverage BI to provide performance and competitor benchmarks to make the organization run smoother and more efficiently.



Identify ways to increase profit



Analyze customer behavior

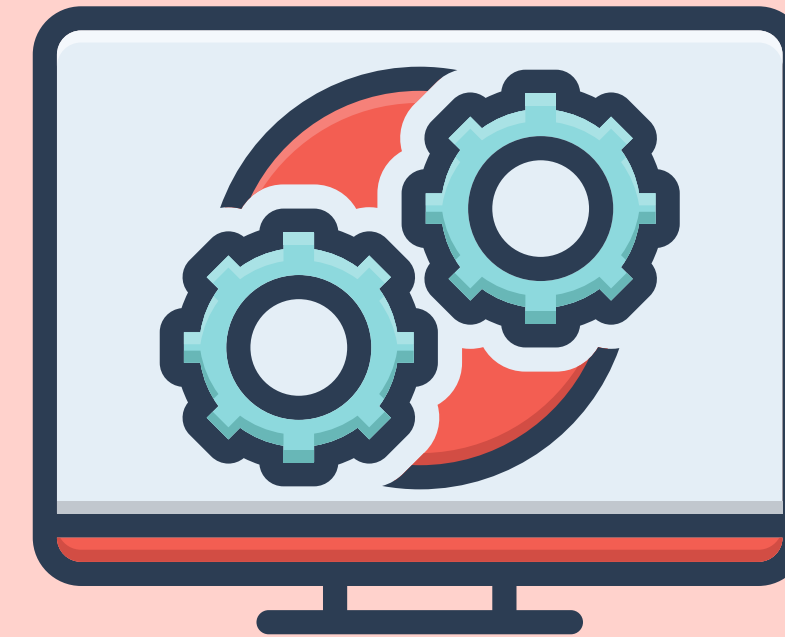


Compare data with competitors





Track performance



Optimize operations



Predict success



Spot market trends



Discover issues or problems



### 3. How business intelligence works?

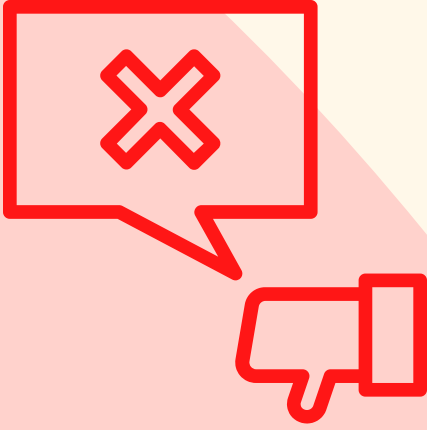
- Gather the necessary data, analyze it, and determine which actions to take to reach their goals.
  - Data is processed and then stored in data warehouses.
- Once it's stored, users can then access the data, starting the analysis process to answer business questions.



## 4. Advantages and disadvantages of BI

- Jump in and start analyzing data
- Provides real time metrics and reports
- Takes less time
- Make key performance indicators
- Information can be easily isolated
- Help to increase productivity
- Can increase profit

- User resistance is one big barrier
- Analyze voluminous amounts of irrelevant and poor quality data.
- Cleanup of irrelevant data
- Most companies don't understand their business processes well enough





# TOOLS FOR BI

- Power BI
- FineReport
- QlikView
- Sisense
- Tableau



# TOOLS FOR BI

## POWER BI

From Microsoft, take the data visualization tools of Excel Pivot Table and Excel to the next level. Provided detailed videos and learning materials to help users quickly get acquainted.

# Power BI

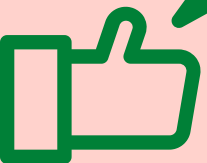




## ADVANTAGE AND DISADVANTAGE

- Excel integration: Power BI can connect to any Microsoft Office software. You can put the raw data into Excel - where you can see behind the scenes already visualized images.
- R Script Visualization: The only tool in the TOP 5 that supports R, using R's rich visualization and analytics capabilities for advanced data presentation and analysis such as forecasting.

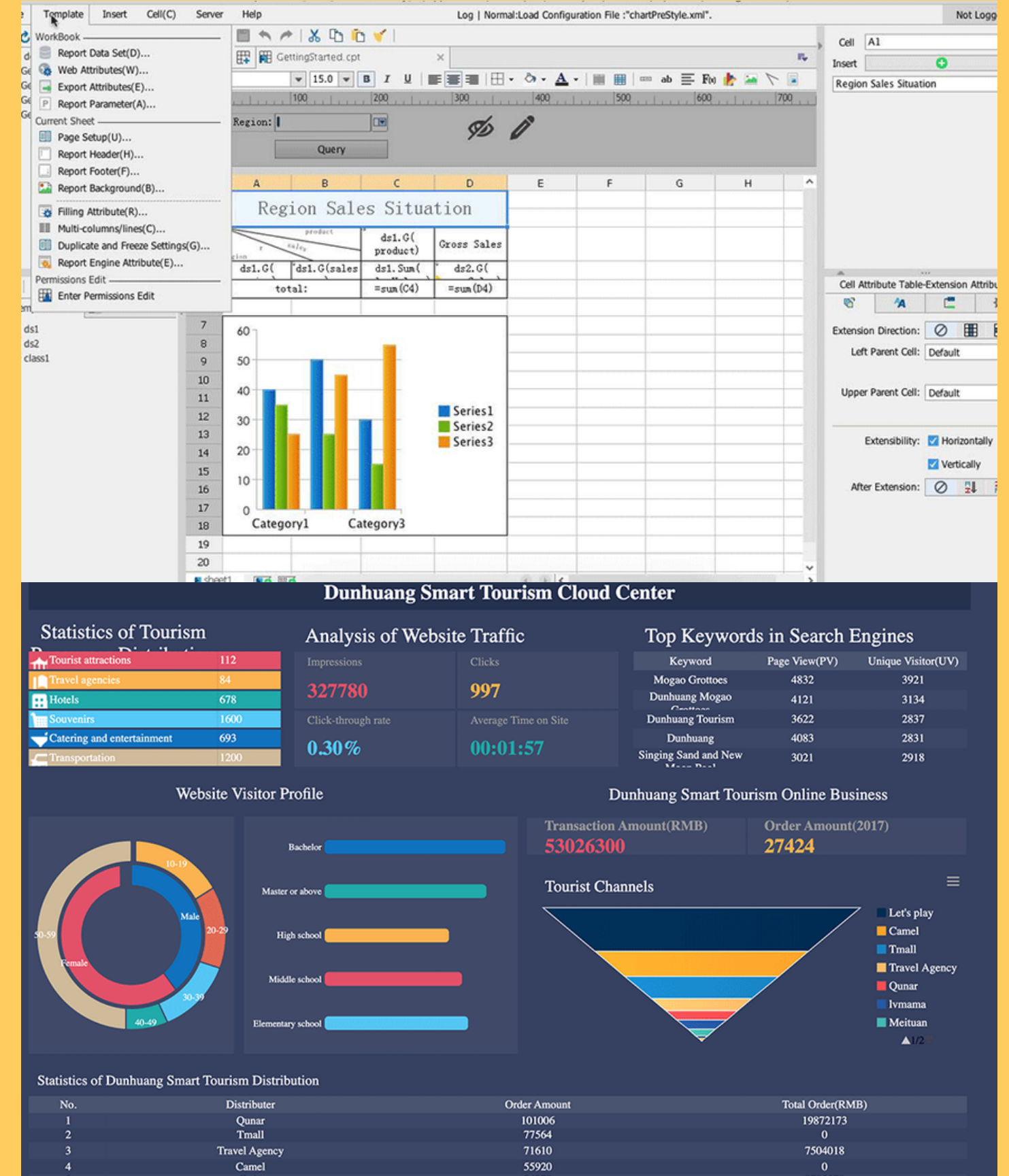
- Management issues: Power BI doesn't support multi-level permissions, can't control the level of granularity of columns viewed by users, and doesn't have complete control over group permissions.
- The data handling capacity is not good for the free version: The free version has a limit on the amount of data that can be processed. Once you reach 2GB, you must upgrade to the paid version to reduce processing time.

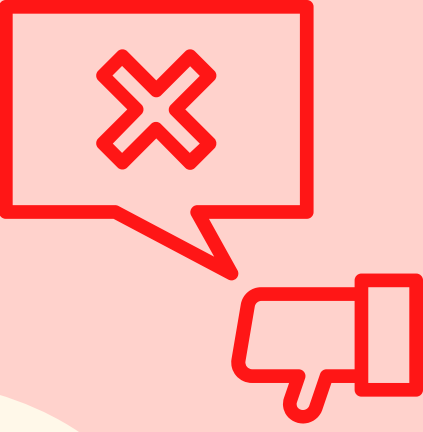


# TOOLS FOR BI

## FINEREPORT

With an interface similar to Excel and the ability to drag and drop objects, FineReport is a great tool for beginners. Anyone who has ever used Excel can quickly use this software. The official website provides detailed learning materials and videos for users, including 24/7 technical support.





## ADVANTAGE AND DISADVANTAGE

- |  |   |   |
|--|---|---|
| <ul style="list-style-type: none"><li>• Smart data entry: FineReport's feature sets it apart, providing rich controls that make it easy to import big data through forms directly into the database, with functions like validation data and temporary storage. In addition, it also supports online and batches import of Excel data.</li></ul> | ! | <ul style="list-style-type: none"><li>• The inconvenience of multidimensional analysis: You need to create a report for each dimension to be able to set up many details for a data cell.</li></ul> |
| <ul style="list-style-type: none"><li>• Easily create complex reports: Impressive handling of complex reports. Concatenate aggregate blocks, eliminating the problem of merging and splitting cells in Excel. Each aggregate block is independent and can be dragged and dropped to be put together to generate ad-hoc reports.</li></ul>        | ! | <ul style="list-style-type: none"><li>• No chart suggestions: You must choose the chart type that suits your needs yourself, as FineReport will not make recommendations.</li></ul>                 |





# TOOLS FOR BI

## QLIKVIEW

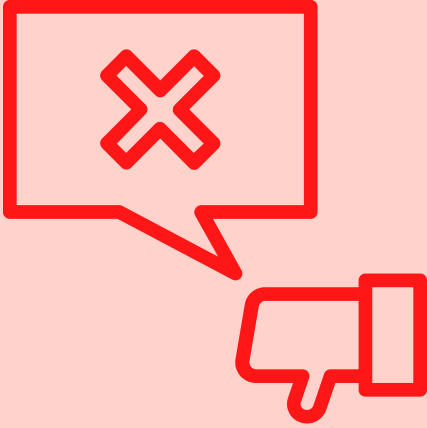
QlikView is a self-service tool that works with its own association technology and internal memory technology. Intuitive interface, easy to use, comes with smart search feature, no need to build blocks, suitable for academic analysis rather than daily analysis.



## ADVANTAGE AND DISADVANTAGE

- In-memory technology: QlikView computes data while it moves from the backend to the frontend. Since no aggregated or pre-computed data is stored, system memory can be saved and data transfer speeds are fast.
- Search for direct and indirect data: You can find both direct and indirect data. Directly, you can input data and get information, indirectly, input the desired data related content and get all related data.

- Unfriendly for non-technical users: This limitation can be difficult for end-users to get used to.
- No support for map charts: While map charts are growing, this feature is not available in QlikView. Generating geo-map charts is quite complicated, unless an add-on is purchased from a third party.



# P4: DATASET PREPARATION

# 1, Dataset

| Month  | Domestic Tourists | International Tourists | Average Tourist |
|--------|-------------------|------------------------|-----------------|
| Jan-20 | 7300000           | 1710168                | 4505084         |
| Feb-20 | 4400000           | 1242731                | 2821365.5       |
| Mar-20 | 1300000           | 449923                 | 874961.5        |
| Apr-20 | 0                 | 0                      | 0               |
| May-20 | 3000000           | 0                      | 1500000         |
| Jun-20 | 7000000           | 0                      | 3500000         |
| Jul-20 | 8000000           | 0                      | 4000000         |
| Aug-20 | 2000000           | 0                      | 1000000         |
| Sep-20 | 4500000           | 0                      | 2250000         |
| Oct-20 | 5000000           | 0                      | 2500000         |
| Nov-20 | 6500000           | 0                      | 3250000         |
| Dec-20 | 7000000           | 0                      | 3500000         |
| Jan-21 | 7500000           | 0                      | 3750000         |
| Feb-21 | 2000000           | 0                      | 1000000         |
| Mar-21 | 7000000           | 0                      | 3500000         |
| Apr-21 | 9000000           | 0                      | 4500000         |
| May-21 | 3500000           | 0                      | 1750000         |
| Jun-21 | 1500000           | 0                      | 750000          |
| Jul-21 | 500000            | 0                      | 250000          |
| Aug-21 | 200000            | 0                      | 100000          |
| Sep-21 | 300000            | 0                      | 150000          |
| Oct-21 | 750000            | 0                      | 375000          |
| Nov-21 | 2500000           | 400                    | 1250200         |
| Dec-21 | 5250000           | 3100                   | 2626550         |
|        |                   |                        |                 |

Dataset 1: Number of domestic and international tourists in 2020-2021

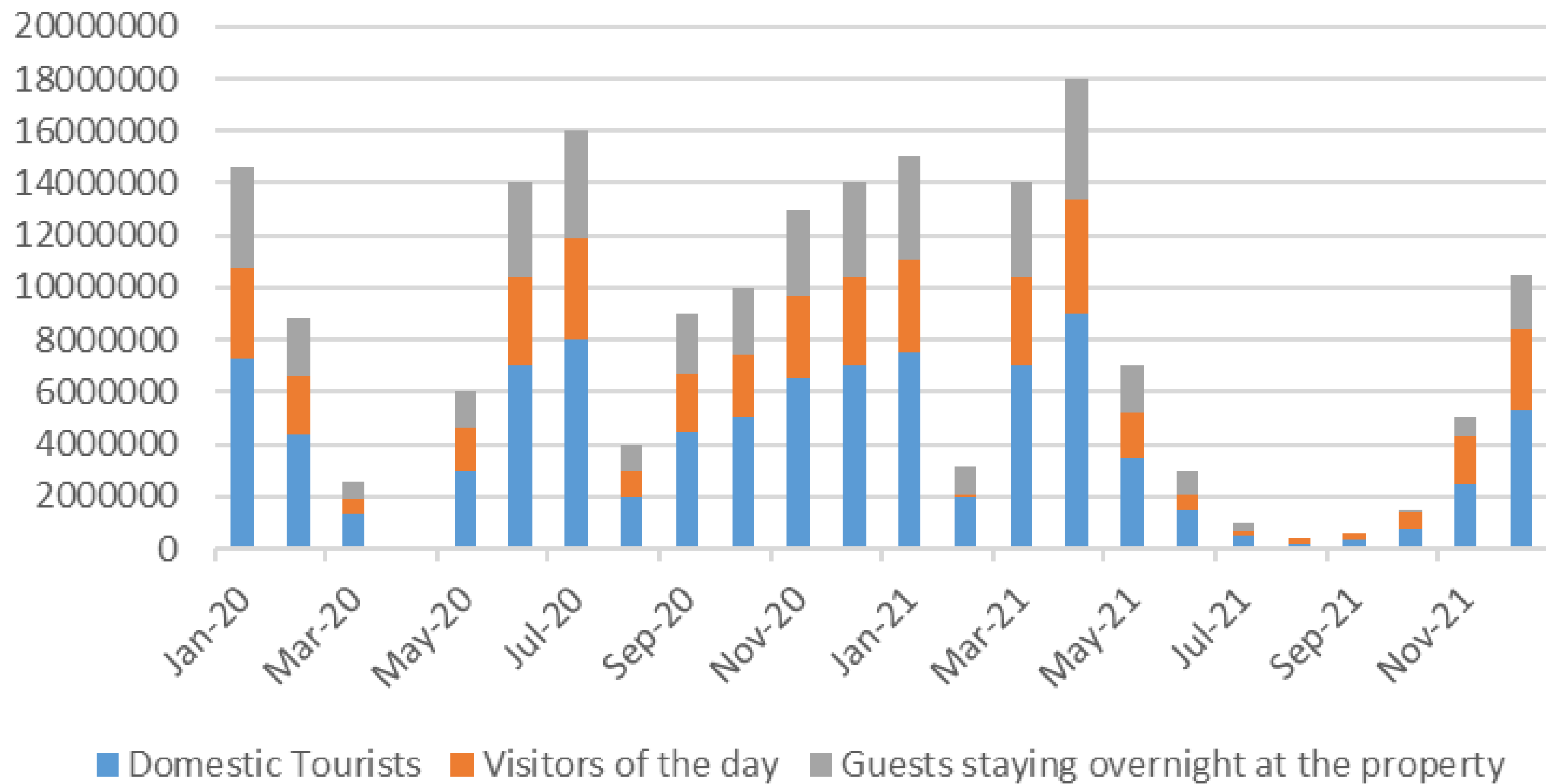
| Month  | Domestic Tourists | Visitors of the day | Guests staying overnight at the property |
|--------|-------------------|---------------------|--|
| Jan-20 | 7300000           | 3400000             | 3900000                                  |
| Feb-20 | 4400000           | 2200000             | 2200000                                  |
| Mar-20 | 1300000           | 600000              | 700000                                   |
| Apr-20 | 0                 | 0                   | 0  |
| May-20 | 3000000           | 1600000             | 1400000                                  |
| Jun-20 | 7000000           | 3400000             | 3600000                                  |
| Jul-20 | 8000000           | 3900000             | 4100000                                  |
| Aug-20 | 2000000           | 1000000             | 1000000                                  |
| Sep-20 | 4500000           | 2200000             | 2300000                                  |
| Oct-20 | 5000000           | 2400000             | 2600000                                  |
| Nov-20 | 6500000           | 3200000             | 3300000                                  |
| Dec-20 | 7000000           | 3400000             | 3600000                                  |
| Jan-21 | 7500000           | 3600000             | 3900000                                  |
| Feb-21 | 2000000           | 100000              | 1000000                                  |
| Mar-21 | 7000000           | 3400000             | 3600000                                  |
| Apr-21 | 9000000           | 4400000             | 4600000                                  |
| May-21 | 3500000           | 1700000             | 1800000                                  |
| Jun-21 | 1500000           | 600000              | 900000                                   |
| Jul-21 | 500000            | 200000              | 300000                                   |
| Aug-21 | 200000            | 200000              | 0  |
| Sep-21 | 300000            | 300000              | 0  |
| Oct-21 | 750000            | 650000              | 100000                                   |
| Nov-21 | 2500000           | 1800000             | 700000                                   |
| Dec-21 | 5250000           | 3150000             | 2100000                                  |

Dataset 2: Number of tourist overnight and in day

## 2, Data pre-process



## number of tourist overnight and in day





<Dataset 1| Static Tourism Industry in 2020 and 2021>

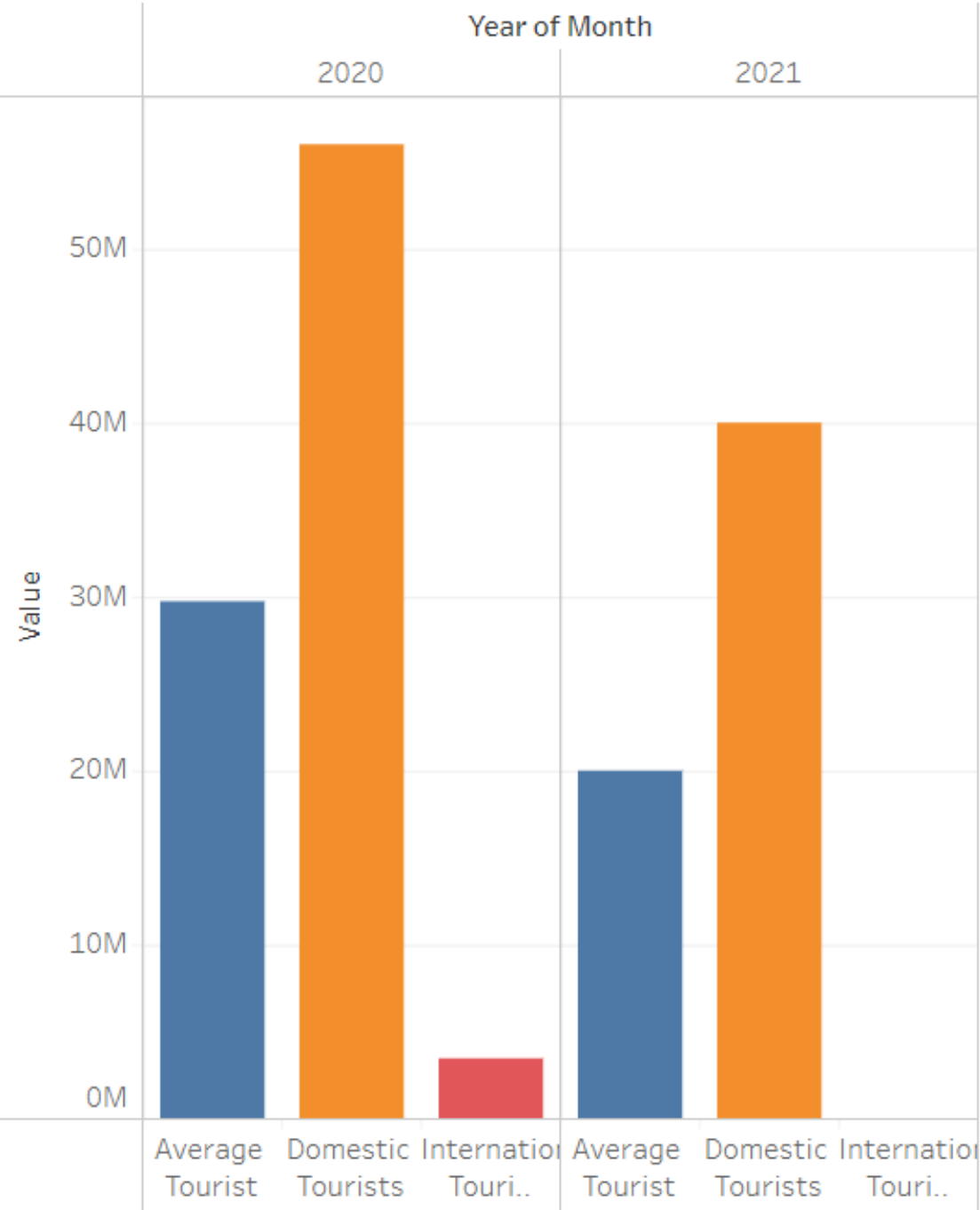
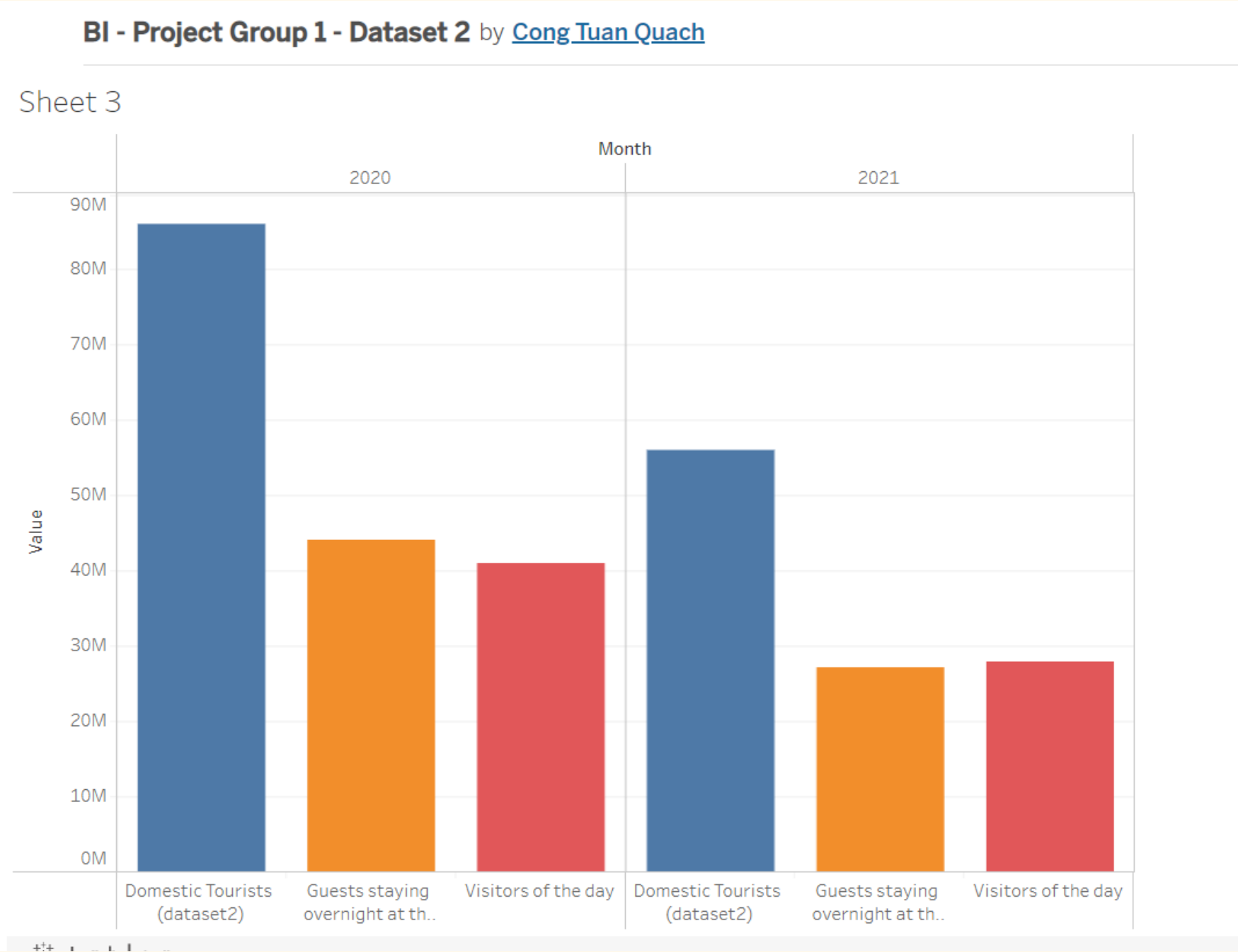


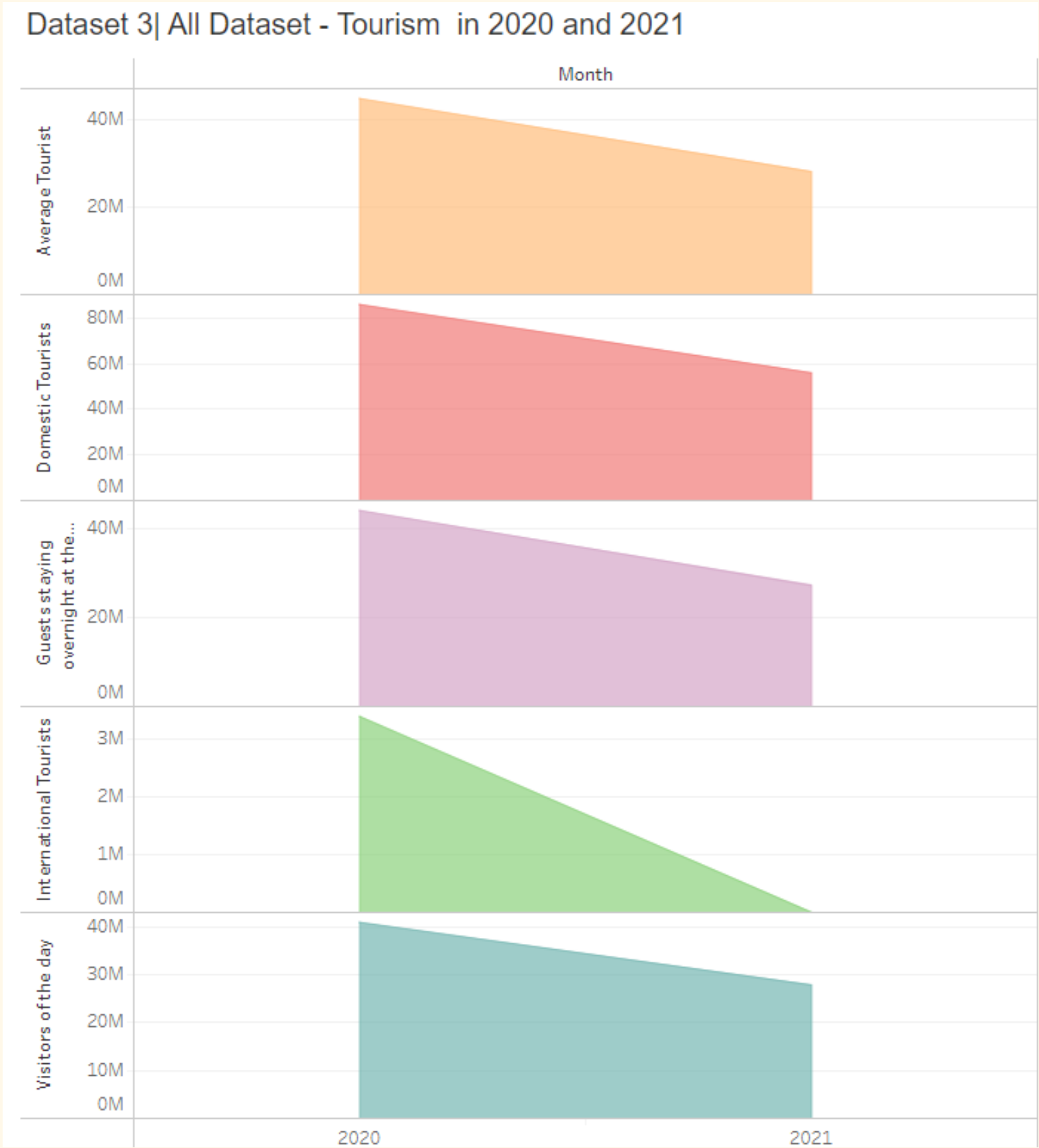
Table 1

# Dataset 1:

# Dataset 2:



# Dataset 3:



# Link Tableau Dashboard

**Dataset 1:** [https://public.tableau.com/app/profile/cong.tuan.quach/viz/BI-ProjectGroup1/Sheet2?publish=yes&fbclid=IwAR1Tf9KmWf3VL3p7BhDUNpXufmhM1-bjeU\\_xLYAKzLco8jcJTencrdIDZe8](https://public.tableau.com/app/profile/cong.tuan.quach/viz/BI-ProjectGroup1/Sheet2?publish=yes&fbclid=IwAR1Tf9KmWf3VL3p7BhDUNpXufmhM1-bjeU_xLYAKzLco8jcJTencrdIDZe8)

**Dataset 2:** <https://public.tableau.com/app/profile/cong.tuan.quach/viz/BI-ProjectGroup1-Dataset2/Sheet3?publish=yes&fbclid=IwAR3rdk20Doq5RqE7RtNjssS-FvYiVzmVGiqDJX6WGLXLtq2uRrmTCobexSw>

**Dataset New : Merge All Dataset (Mix dataset 1 and dataset 2)**

<https://public.tableau.com/app/profile/cong.tuan.quach/viz/BI-ProjectGroup1-DatasetNew/Sheet3?publish=yes&fbclid=IwAR0WSigVDd6kSLB1-YSm5cQzVxxk03QZXg-J-UD7yYZdweZLf9uIT5nEEPw>

# **M3: ANALYZE DATA WITH PYTHON & MAKE DECISION FOR BUSINESS**

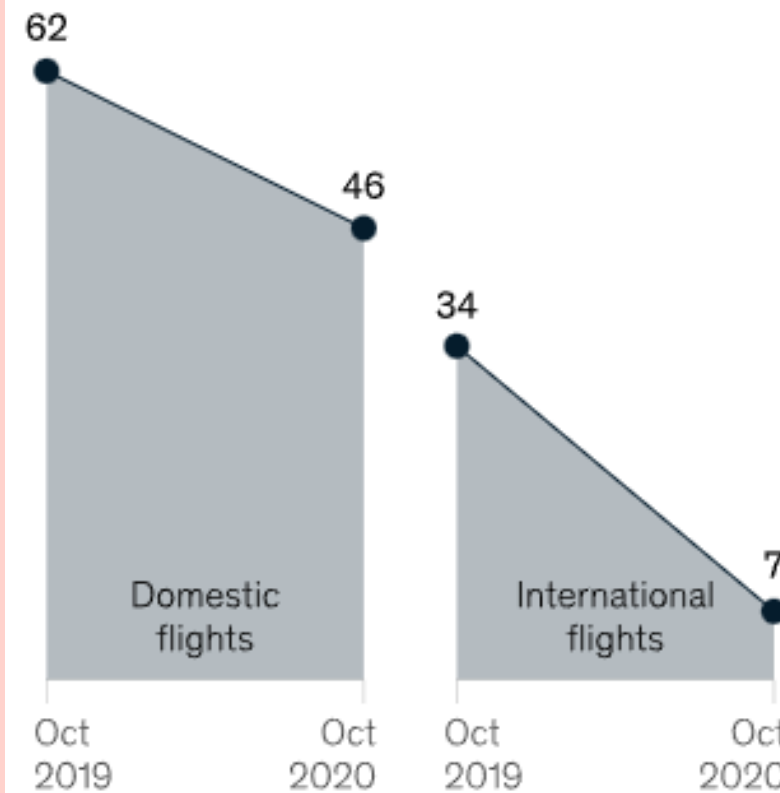
Combining Dataset with Python, we have  
implemented a program based on these criteria

# THE STATE OF TRAVEL IN VIETNAM TODAY: STAYING AFLOAT

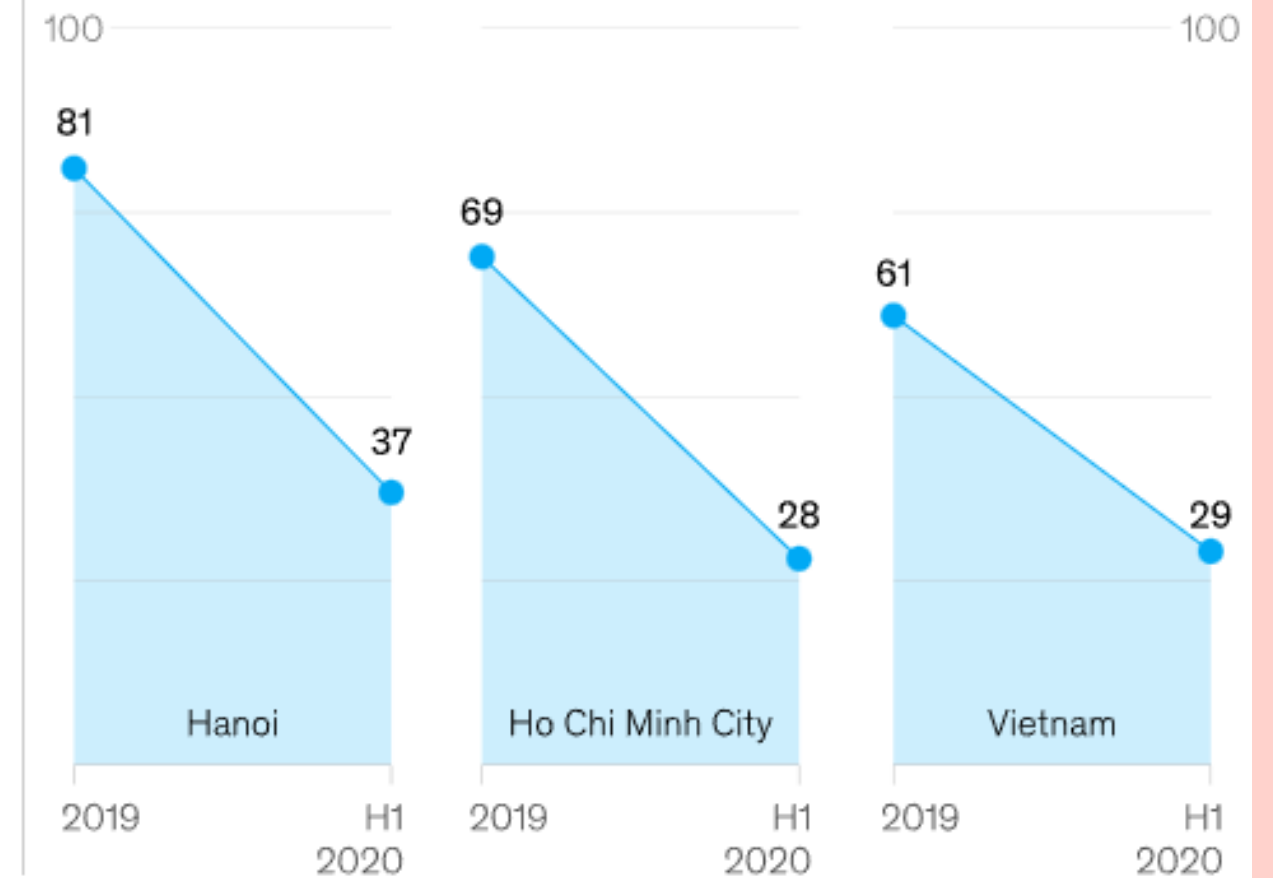
Vietnam's tourism sector relies heavily on international travel, which plunged last year. International flights dropped 80 percent in October 2020 from the same time period a year earlier. Hotels, in turn, filled only 30 percent of their rooms.

COVID-19 had an outsize impact on Vietnam's tourism sector.

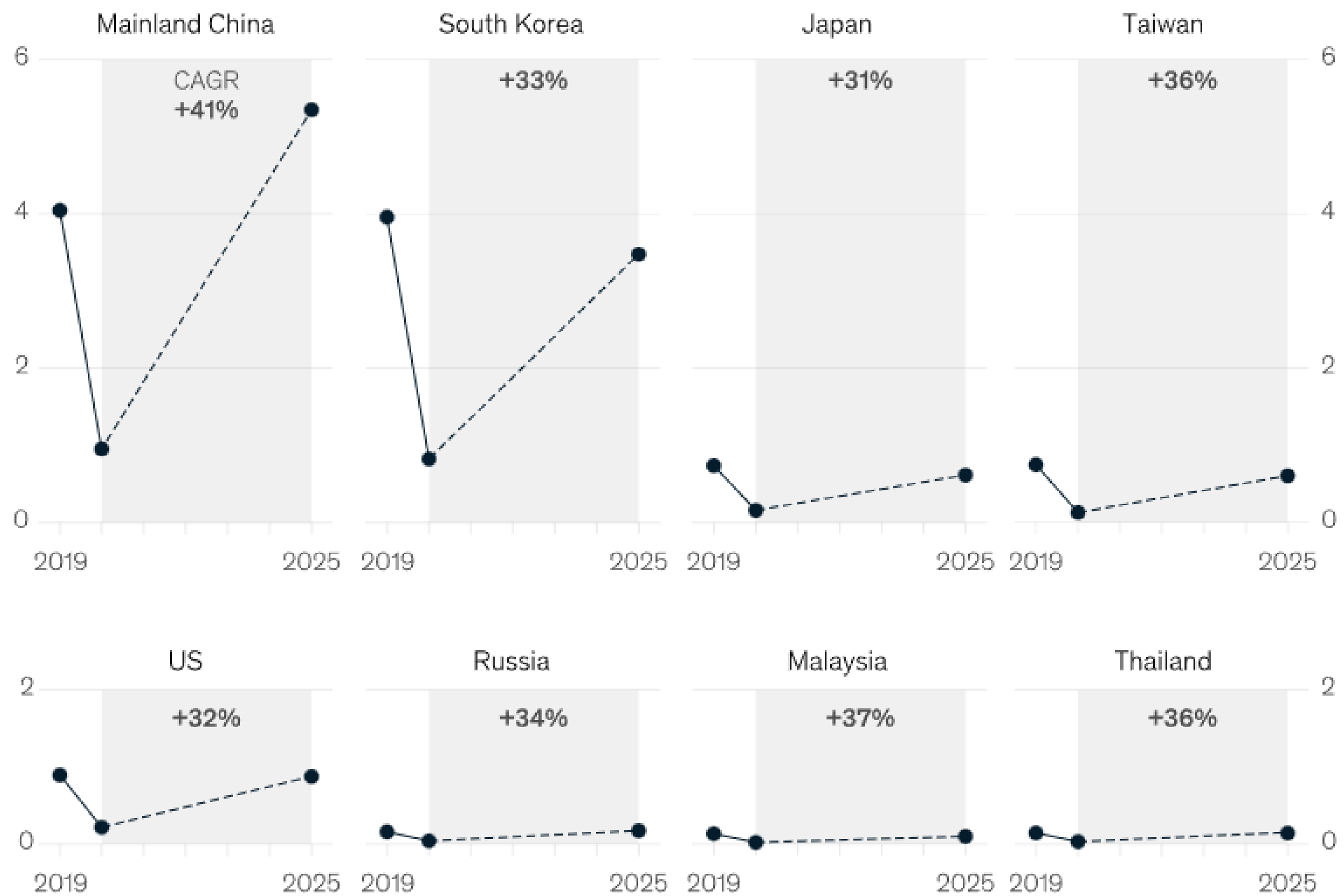
Number of passengers,<sup>1</sup> millions



Hotel-occupancy rate, %



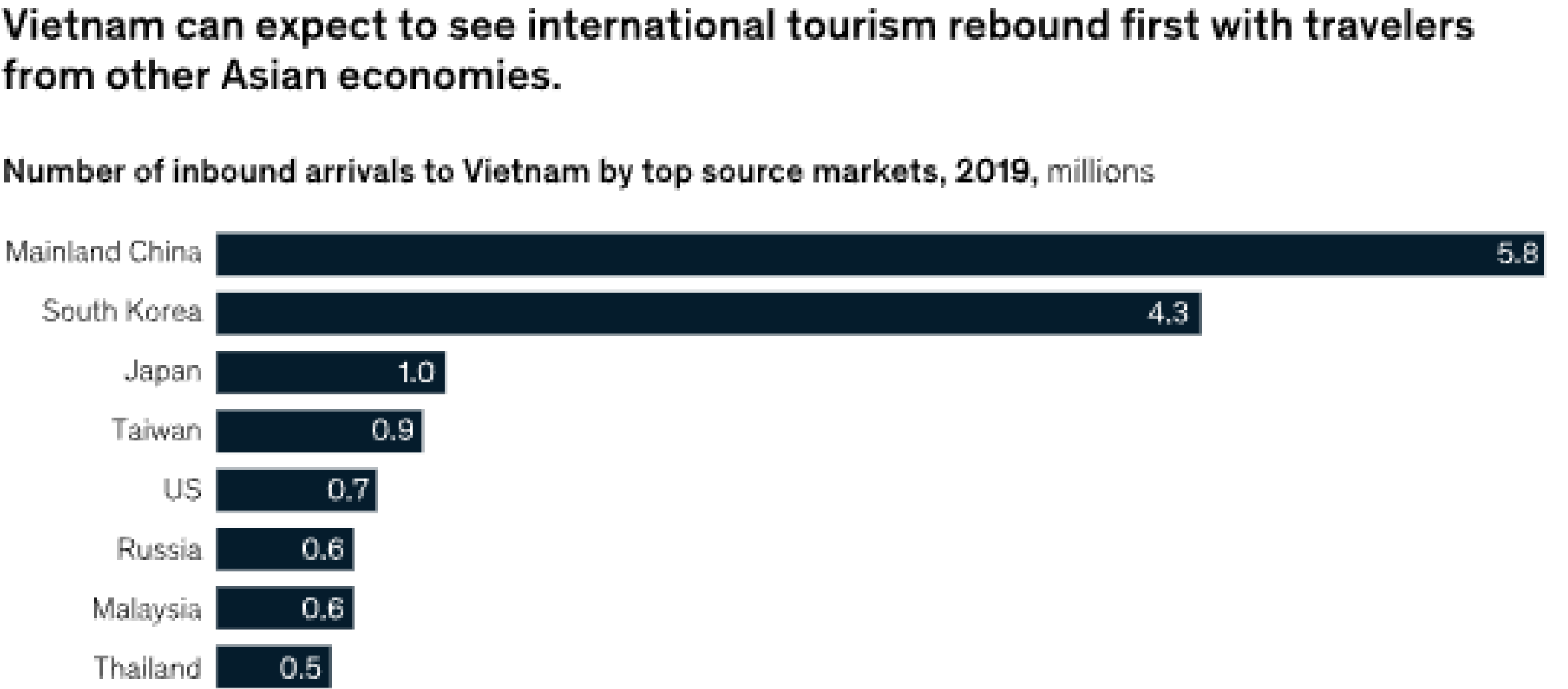
Inbound tourism expenditures, A1 recovery scenario, \$ billion





# LOOKING AHEAD: VIETNAM'S TOURISM INDUSTRY CAN RECOVER BY 2024

Even with favorable tailwinds driven by domestic tourism, Vietnam will be dependent on international markets, which represent around \$12 billion in spending. The majority of Vietnam's international tourists come from Asian countries, with those from China, Japan, South Korea, and Taiwan accounting for around 80 percent of Vietnam's foreign tourism spending. Vietnam's strong economic ties with these countries could lead to a relatively fast tourism-industry recovery compared with other key tourist destinations in Europe and North America



# MAKE BUSINESS DECISIONS BASED ON THE ANALYSIS RESULTS OF BI



Based on the analysis results in Tableau, we have a number of strategies to help overcome the economy of the tourism industry after the pandemic as follows:

- Introduce isolation policies for countries applying vaccine passports.
- Stimulate tourism demand, offer many incentives to the airline and hotel industries.
- Advertise and communicate tourist attractions through Kols, Youtuber, Tiktok, ..

## Strategy

Based on the above strategic information, we can come up with short-term tactics as follows:

- Discount on air tickets, restaurants, hotels at tourist destinations.
- Proposal to reduce taxes and fees for the tourism industry.
- Provide policies for international tourists to Vietnam.
- Open international routes, exempt from VISA for transit flights.



## Tactic

# DISPLAY DATASET 1

```
PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE
python + v [icon] [icon] ^ x

-----
> Enter choice: 1

+ You have chosen: Display data
+ Choice:
    1. Display: TourismIndustry.
    2. Display: DomesticTourism.
    3. Exit function.
> Enter choice: 1
Enter number of rows display: 25

+ You choose to read the file with the path:dataset2.csv

[red box] = NULL
File content:
Month |Domestic Tourists |Visitors of the day |Guests staying overnight at the property |
-----
1/20/2022 |7300000 |3400000 |3900000
2/20/2022 |4400000 |2200000 |2200000
3/20/2022 |1300000 |600000 |700000
4/20/2022 |0 |0 |0
5/20/2022 |3000000 |1600000 |1400000
6/20/2022 |7000000 |3400000 |3600000
7/20/2022 |8000000 |3900000 |4100000
8/20/2022 |2000000 |1000000 |1000000
9/20/2022 |4500000 |2200000 |2300000
10/20/2022 |5000000 |2400000 |2600000
11/20/2022 |6500000 |3200000 |3300000
12/20/2022 |7000000 |3400000 |3600000
1/21/2022 |7500000 |3600000 |3900000
2/21/2022 |2000000 |100000 |1000000
3/21/2022 |7000000 |3400000 |3600000
4/21/2022 |9000000 |4400000 |4600000
5/21/2022 |3500000 |1700000 |1800000
6/21/2022 |1500000 |600000 |900000
7/21/2022 |500000 |200000 |300000
8/21/2022 |200000 |200000 |0
9/21/2022 |300000 |300000 |0
10/21/2022 |750000 |650000 |100000
11/21/2022 |2500000 |1800000 |700000
12/21/2022 |5250000 |3150000 |2100000

+ You have chosen: Display data
+ Choice:
    1. Display: TourismIndustry.
    2. Display: DomesticTourism.
    3. Exit function.
> Enter choice: 
```

# DISPLAY DATASET 2

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

python + ▾ □ □ ⌵ ✕

11/21/2022 |2500000 |1800000 |700000 |  
12/21/2022 |5250000 |3150000 |2100000 |

+ You have chosen: Display data  
+ Choice:  
1. Display: TourismIndustry.  
2. Display: DomesticTourism.  
3. Exit function.  
> Enter choice: 2  
Enter number of rows display: 25

+ You choose to read the file with the path:dataset1.csv

= NULL  
File content:

| Month  | Domestic Tourists | International Tourists | Average Tourist |
|--------|-------------------|------------------------|-----------------|
| Jan-20 | 7300000           | 1710168                | 4505084         |
| Feb-20 | 4400000           | 1242731                | 2821365.5       |
| Mar-20 | 1300000           | 449923                 | 874961.5        |
| Apr-20 | 0                 | 0                      | 0               |
| May-20 | 3000000           | 0                      | 1500000         |
| Jun-20 | 7000000           | 0                      | 3500000         |
| Jul-20 | 8000000           | 0                      | 4000000         |
| Aug-20 | 2000000           | 0                      | 1000000         |
| Sep-20 | 4500000           | 0                      | 2250000         |
| Oct-20 | 5000000           | 0                      | 2500000         |
| Nov-20 | 6500000           | 0                      | 3250000         |
| Dec-20 | 7000000           | 0                      | 3500000         |
| Jan-21 | 7500000           | 0                      | 3750000         |
| Feb-21 | 2000000           | 0                      | 1000000         |
| Mar-21 | 7000000           | 0                      | 3500000         |
| Apr-21 | 9000000           | 0                      | 4500000         |
| May-21 | 3500000           | 0                      | 1750000         |
| Jun-21 | 1500000           | 0                      | 750000          |
| Jul-21 | 500000            | 0                      | 250000          |
| Aug-21 | 200000            | 0                      | 100000          |
| Sep-21 | 300000            | 0                      | 150000          |
| Oct-21 | 750000            | 0                      | 375000          |
| Nov-21 | 2500000           | 400                    | 1250200         |
| Dec-21 | 5250000           | 3100                   | 2626550         |

+ You have chosen: Display data  
+ Choice:  
1. Display: TourismIndustry.  
2. Display: DomesticTourism.  
3. Exit function.  
> Enter choice:

# MERGE 2 DATASET AND SHOW CONNECTION

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

> python + ▾ 🗑 ⌵ ✕

|        |         |         |         |   |         |  |
|--------|---------|---------|---------|---|---------|--|
| 20-Jul | 8000000 | 3900000 | 4100000 | 0 | 4000000 |  |
| 20-Aug | 2000000 | 1000000 | 1000000 | 0 | 1000000 |  |
| 20-Sep | 4500000 | 2200000 | 2300000 | 0 | 2250000 |  |
| 20-Oct | 5000000 | 2400000 | 2600000 | 0 | 2500000 |  |

\*\*\*\*\*FILE CSV HANDING PROGRAM\*\*\*\*\*

-----The functions of the program-----

|

Enter (1) : Display data

|

Enter (2) : Merge data

|

Enter (3) : Display data was merged

|

Enter (4) : Clean data

|

Enter (5) : Exit

|

-----

> Enter choice: 3

+ You have chosen: Display data was merged

+ With path: datasetnew.csv

  = NULL

File content:

|        |                   |                     |  |                        |                 |  |
|--------|-------------------|---------------------|--|------------------------|-----------------|--|
| Month  | Domestic Tourists | Visitors of the day | Guests staying overnight at the property | International Tourists | Average Tourist |  |
| -----  |                   |                     |  |                        |                 |  |
| 20-Jan | 7300000           | 3400000             | 3900000                                  | 1710168                | 4505084         |  |
| 20-Feb | 4400000           | 2200000             | 2200000                                  | 1242731                | 2821365.5       |  |
| 20-Mar | 1300000           | 600000              | 700000                                   | 449923                 | 874961.5        |  |
| 20-Apr | 0                 | 0                   | 0  | 0                      | 0               |  |
| 20-May | 3000000           | 1600000             | 1400000                                  | 0                      | 1500000         |  |
| 20-Jun | 7000000           | 3400000             | 3600000                                  | 0                      | 3500000         |  |
| 20-Jul | 8000000           | 3900000             | 4100000                                  | 0                      | 4000000         |  |
| 20-Aug | 2000000           | 1000000             | 1000000                                  | 0                      | 1000000         |  |
| 20-Sep | 4500000           | 2200000             | 2300000                                  | 0                      | 2250000         |  |
| 20-Oct | 5000000           | 2400000             | 2600000                                  | 0                      | 2500000         |  |

\*\*\*\*\*FILE CSV HANDING PROGRAM\*\*\*\*\*

-----The functions of the program-----

|

Enter (1) : Display data

|

Enter (2) : Merge data

|

Enter (3) : Display data was merged

|

Enter (4) : Clean data

|

Enter (5) : Exit

|

-----

> Enter choice:



# CLEAN DATA

PROBLEMS   OUTPUT   TERMINAL   DEBUG CONSOLE

20-Jul|800000|0|400000|800000|390000|410000|  
20-Aug|200000|0|100000|200000|100000|100000|  
20-Sep|450000|0|225000|450000|220000|230000|  
20-Oct|500000|0|250000|500000|240000|260000|

\*\*\*\*\*FILE CSV HANDING PROGRAM\*\*\*\*\*  
-----The functions of the program-----  
|Enter (1) : Display data|  
|Enter (2) : Merge data|  
|Enter (3) : Display data was merged|  
|Enter (4) : Clean data|  
|Enter (5) : Exit|  
-----  
> Enter choice: 3  
+ You have chosen: Display data was merged  
+ With path: datasetnew.csv  
  
= NULL  
File content:  
Month|Domestic Tourists|International Tourists|Average Tourist|Domestic Tourists|Visitors of the day|Guests staying overnight at the property|  
-----  
20-Jan|7300000|1710168|4505084|7300000|3400000|3900000|  
20-Feb|4400000|1242731|2821365.5|4400000|2200000|2200000|  
20-Mar|1300000|449923|874961.5|1300000|600000|700000|  
20-Apr|0|0|0|0|0|0|  
20-May|3000000|0|1500000|3000000|1600000|1400000|  
20-Jun|7000000|0|3500000|7000000|3400000|3600000|  
20-Jul|8000000|0|4000000|8000000|3900000|4100000|  
20-Aug|2000000|0|1000000|2000000|1000000|1000000|  
20-Sep|4500000|0|2250000|4500000|2200000|2300000|  
20-Oct|5000000|0|2500000|5000000|2400000|2600000|  
-----  
\*\*\*\*\*FILE CSV HANDING PROGRAM\*\*\*\*\*  
-----The functions of the program-----  
|Enter (1) : Display data|  
|Enter (2) : Merge data|  
|Enter (3) : Display data was merged|  
|Enter (4) : Clean data|  
|Enter (5) : Exit|  
-----  
> Enter choice:



= NULL  
File content:  
Month|Domestic Tourists|International Tourists|Average Tourist|Domestic Tourists|Visitors of the day|Guests staying overnight at the property|  
-----  
20-Jan|7300000|1710168|4505084|7300000|3400000|3900000|  
20-Feb|4400000|1242731|2821365.5|4400000|2200000|2200000|  
20-Mar|1300000|449923|874961.5|1300000|600000|700000|  
20-Apr|0||0|0|0|0|  
20-May|3000000|0|1500000|3000000|1600000|1400000|  
20-Jun|7000000|0|3500000|7000000|3400000|3600000|  
20-Jul|8000000|0|4000000|8000000|3900000|4100000|  
20-Aug|2000000|0|1000000|2000000|1000000|1000000|  
20-Sep|4500000|0|2250000|4500000|2200000|2300000|  
20-Oct|5000000|0|2500000|5000000|2400000|2600000|  
-----  
\*\*\*\*\*FILE CSV HANDING PROGRAM\*\*\*\*\*  
-----The functions of the program-----  
|Enter (1) : Display data|  
|Enter (2) : Merge data|  
|Enter (3) : Display data was merged|  
|Enter (4) : Clean data|  
|Enter (5) : Exit|  
-----  
> Enter choice: