MiniProject2 - SQL: From Data to Insight

NYC Airbnb for STUDENTS

StudentHub: NYC Rentals

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DATA-FT-Sept-2025

Mini Project Overview:

1. Selecting NYC Dataset to analyse
   - Data retrieved from Kaggle
2. Tools chosen for analysis
   - SQL
   - Python
3. Database Design & Data Transformation
4. Cleaned & Filtered Script
5. Insights & Results

NYC Dataset selected - Data Acquisition, Transformation and Examination:

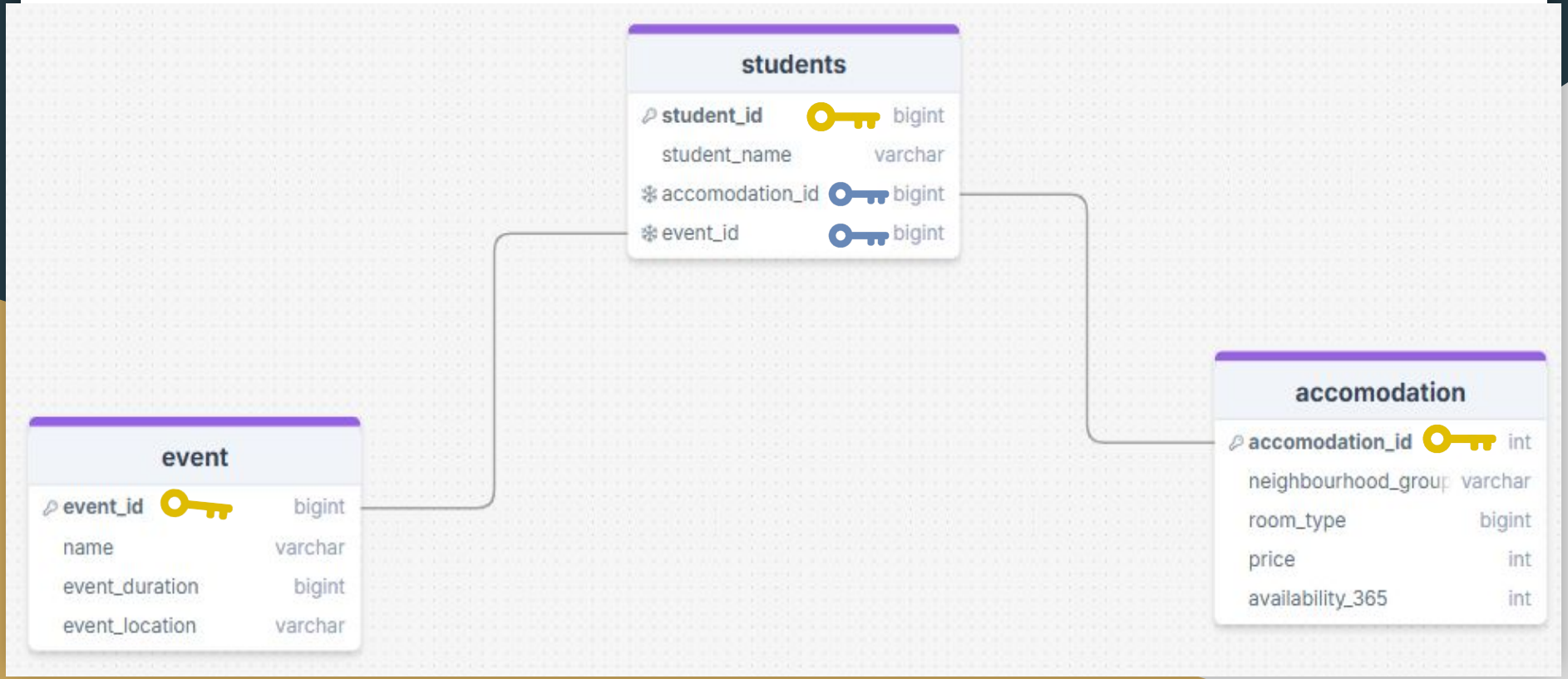
A university office is tasked with trying to find the closest and most cost effective AirBnB in NYC for a group of students attending events in the city.

Topics covered:

- ★ Highlight the business problem and the hypotheses that guided our approach.
- ★ Highlight the primary sources of data and any complementary datasets.
- ★ Data acquisition, transformation and examination process
- ★ Discuss challenges faced during the data sourcing and integration.
- ★ Briefly describe how the supplemental data aligns with our primary dataset.

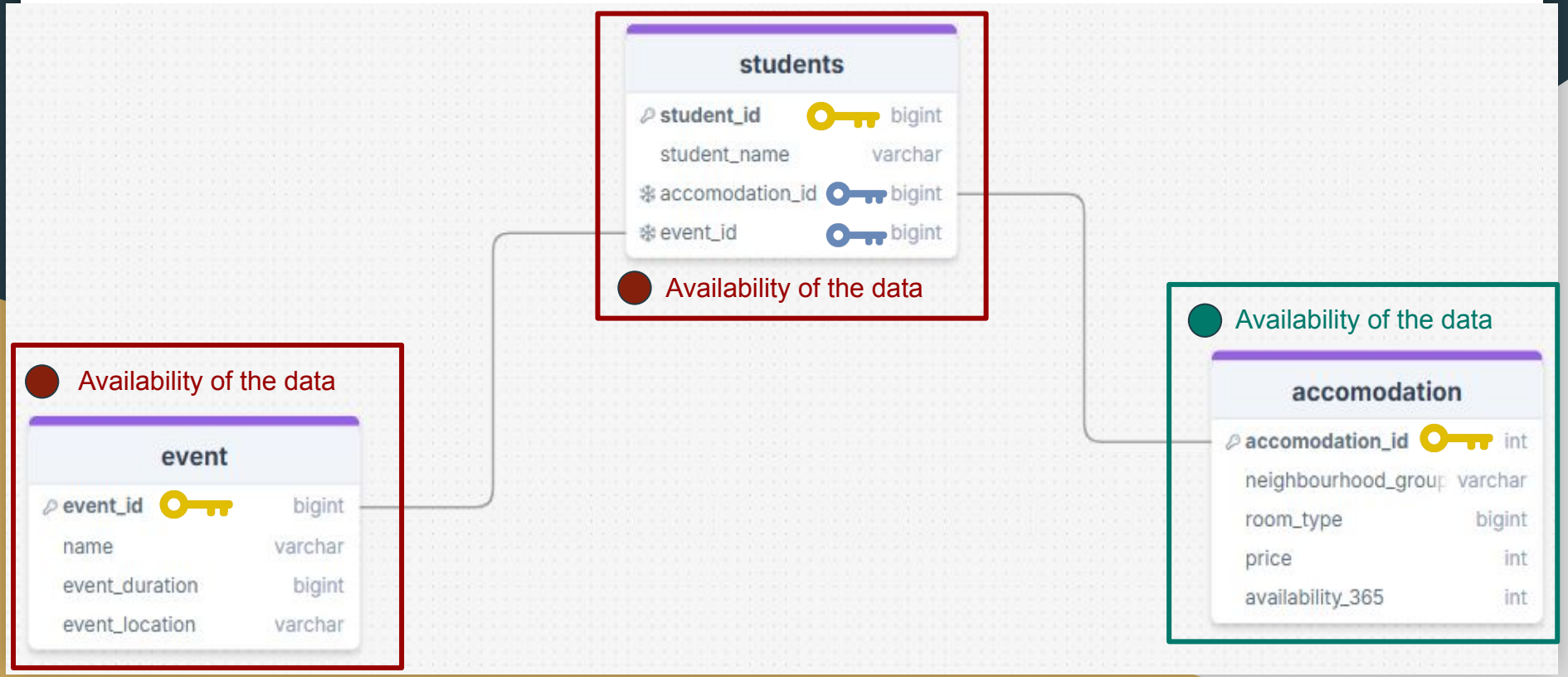
Database Design & Data Transformation:

StudentHub: NYC Rentals : Entity–Relationship Diagram (ERD) - project



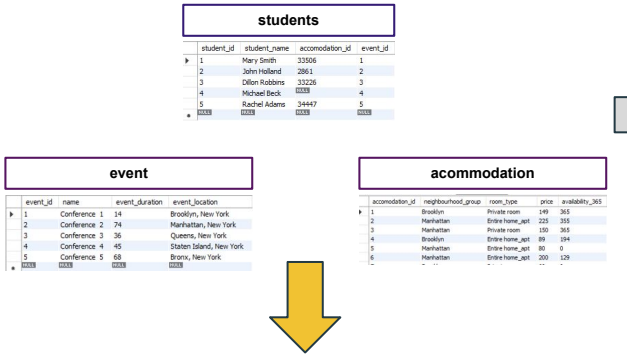
Database Design & Data Transformation:

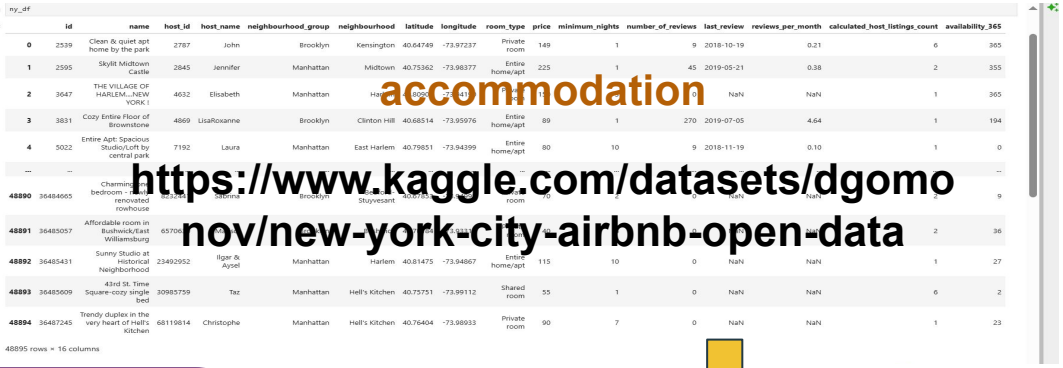
StudentHub: NYC Rentals : Entity–Relationship Diagram (ERD) - project



Database Design & Data Transformation:

StudentHub: NYC Rentals : Entity–Relationship Diagram (ERD) - realisation





accommodation

https://www.kaggle.com/datasets/dgomonov/new-york-city-airbnb-open-data

events_df.csv

```
[38]: # Create DataFrame
      events_df = pd.DataFrame(events)

[39]: events_df.info()

      <class 'pandas.core.frame.DataFrame'>
      RangeIndex: 5 entries, 0 to 4
      Data columns (total 4 columns):
       #   Column          Non-Null Count  Dtype
      ---  ------          --------------  -----
       0   event_id        5 non-null      int64
       1   event_name      5 non-null      object
       2   event_duration  5 non-null      int64
       3   event_location  5 non-null      object
      dtypes: int64(2), object(2)
      memory usage: 292.0+ bytes

[41]: # Show table
      print(events_df)

         event_id     event_name  event_duration          event_location
      0         1  Conference  1              14       Brooklyn, New York
      1         2  Conference  2              74     Manhattan, New York
      2         3  Conference  3              36         Queens, New York
      3         4  Conference  4              45  Staten Island, New York
      4         5  Conference  5              68          Bronx, New York
```

students_df.csv

```
[26]: ### students.csv file ###

[27]: # Students data
      students = [{'student_id': 1,
        'student_name': 'Mary Smith'},
       {'student_id': 2,
        'student_name': 'John Holland'},
       {'student_id': 3,
        'student_name': 'Dillon Robbins'},
       {'student_id': 4,
        'student_name': 'Michael Beck'},
       {'student_id': 5,
        'student_name': 'Rachel Adams'}]

[28]: students

[28]: [{'student_id': 1, 'student_name': 'Mary Smith'},
       {'student_id': 2, 'student_name': 'John Holland'},
       {'student_id': 3, 'student_name': 'Dillon Robbins'},
       {'student_id': 4, 'student_name': 'Michael Beck'},
       {'student_id': 5, 'student_name': 'Rachel Adams'}]

[29]: students_df = pd.DataFrame(students)
```

ny_df_cleaned_final.csv

```
[6]: ny_df_cleaned_final
```

[6]:

	neighbourhood_group	room_type	price	availability_365
0	Brooklyn	Private room	149	365
1	Manhattan	Entire home_apt	225	355
2	Manhattan	Private room	150	365
3	Brooklyn	Entire home_apt	89	194
4	Manhattan	Entire home_apt	80	0
...	...	...	...	...
48890	Brooklyn	Private room	70	9
48891	Brooklyn	Private room	40	36
48892	Manhattan	Entire home_apt	115	27
48893	Manhattan	Shared room	55	2
48894	Manhattan	Private room	90	23

48895 rows × 4 columns

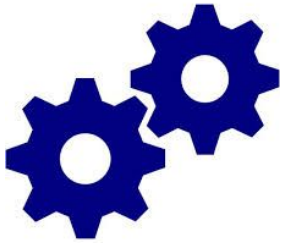
Database Design & Data Transformation:

StudentHub: NYC Rentals : Entity–Relationship Diagram (ERD) - realisation

MySQL

students

student_id	student_name	accomodation_id	event_id
1	Mary Smith	33506	1
2	John Holland	2861	2
3	Dillon Robbins	33226	3
4	Michael Beck	NULL	4
5	Rachel Adams	34447	5
NULL	NULL	NULL	NULL



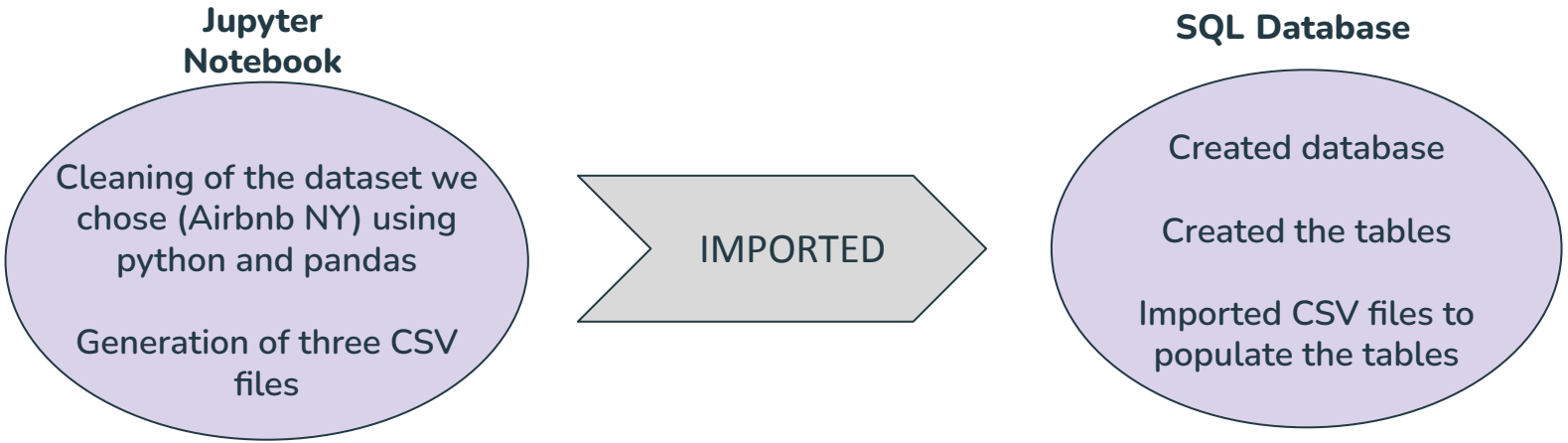
event

event_id	name	event_duration	event_location
1	Conference 1	14	Brooklyn, New York
2	Conference 2	74	Manhattan, New York
3	Conference 3	36	Queens, New York
4	Conference 4	45	Staten Island, New York
5	Conference 5	68	Bronx, New York
NULL	NULL	NULL	NULL

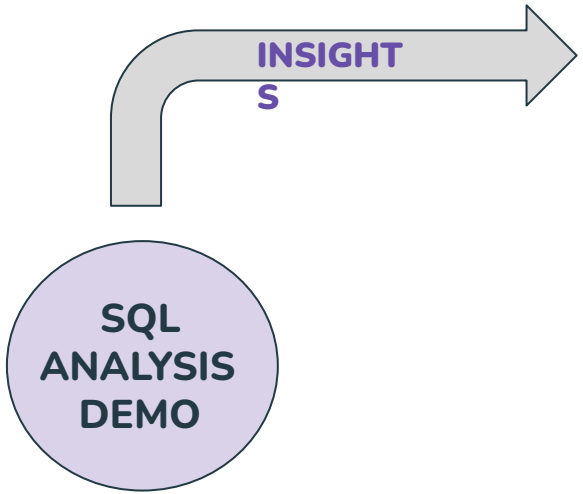
accommodation

accomodation_id	neighbourhood_group	room_type	price	availability_365
1	Brooklyn	Private room	149	365
2	Manhattan	Entire home_apt	225	355
3	Manhattan	Private room	150	365
4	Brooklyn	Entire home_apt	89	194
5	Manhattan	Entire home_apt	80	0
6	Manhattan	Entire home_apt	200	129

Python cleaning and SQL database creation:



SQL Insights & Advanced Analysis:



- No accomodation in the dataset that had enough availability period located in Staten Island
- We could determine the cheapest option in the neighbourhood that had enough and the higher availability for each student, considering the event to attend
- We decided that Michael Beck will stay at the Airbnb in Manhattan with John Holland, as it is an entire home apartment and John's event will take longer than Michael's event.

Conclusions & Business Implications:

Best Accomodation:

1. Each student is linked to an event and assigned an accommodation based on location, availability, budget and room type

Condition

2. Price is more than 0

If multiple options exist, one with the highest availability is chosen.

Criteria

3. Accomodation is in the same neighbourhood, as the event.

Available at least for the whole event duration

The students are allotted accommodations such as Entire home apartments or Private rooms, ensuring the most cost-effective and suitable options for their respective events. However, since accommodation was not available for Student 4, they will need to adjust by sharing or staying near other students in nearby locations such as Manhattan or Brooklyn.

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Thank You !

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