**SVKM’s NMIMS**

**Mukesh Patel School of Technology Management & Engineering**

A.Y. 2022 - 23

**Course: Database Management Systems**

**Project Report**

| Program | BTech AI | |
| --- | --- | --- |
| Semester | 3rd | |
| Name of the Project: | Airport Management System | |
|  | | |
| Details of Project Members |  |  |
| Batch | Roll No. | Name |
| B1 | I028 | Aditya Kothari |
| B1 | I026 | Aditya Katariya |
| B1 | I020 | Aum Ghag |
| B1 | I018 | Urav Farooqui |
| Date of Submission: 16/10/2022 | | |

**Contribution of each project Members:**

| Roll No. | Name: | Contribution |
| --- | --- | --- |
| I028 | Aditya Kothari | Database creation, Data insertion, Python connectivity, GUI |
| I020 | Aum Ghag | Database creation |
| I018 | Urav Farooqui | Data entry |
| I026 | Aditya Katariya | Database creation, GUI |

**Note:**

1. Create a readme file if you have multiple files
2. All files must be properly named (I004\_DBMSProject)
3. Submit all relevant files of your work ( Report, all SQL files, Any other files)
4. **Plagiarism is highly discouraged (Your report will be checked for plagiarism)**

**Rubrics for the Project evaluation:**

* Innovative Ideas and self learning (5 Marks) Idea should not be regular such as Hotel, Library Management system etc.
* Implementation and Design (10 Marks) It includes ER model, Relational model and Normalization of tables.
* Project Demonstration and Viva (5 Marks)

**Project Report**

**Airport Management System**

**by**

**Aditya Kothari, Roll number: I028**

**Aditya Katariya, Roll number: I026**

**Aum Ghag, Roll number: I020**

**Urav Farooqui, Roll number: I018**

**Course: DBMS**

**AY: 2022-23**

**Table of Contents**

| **Sr no.** | **Topic** | **Page no.** |
| --- | --- | --- |
| **1** | Storyline |  |
| **2** | Components of Database Design |  |
| **3** | Entity Relationship Diagram |  |
| **4** | Relational Model |  |
| **5** | Normalization |  |
| **6** | SQL Queries |  |
| **7** | Learning from the Project |  |
| **8** | Challenges you faced while doing the Project |  |
| **9** | Conclusion |  |

**I. Storyline**

This section should describe the requirements for the chosen database topic. Form a storyline and describe in detail.

The Project is a demonstration of Airport Internal Management System. This Database will be used by the Airport to store its internal information. This Database contains confidential information of the airport and is not open to the public eye. Our Database contains crucial information about the airlines, passengers, employees such as their unique id’s, their contact information. Airport management system using SQL is very helpful as it enables us to run specific queries that tells us about the database to fetch the desired information. With the Database we can generate customer specific information like ticket which depends on other tables and relations which makes ticket a weak entity.

With the integration of python, the frontend is pretty impressive. Our project simulates what a management system would look like at a larger scale. We can also add more tables and relations which would further enhance the database system. Our project at a pilot level is grand and industry ready.

**II. Components of Database Design**

Describe all entities along with their attributes here. Also, mention the primary keys for each entity.

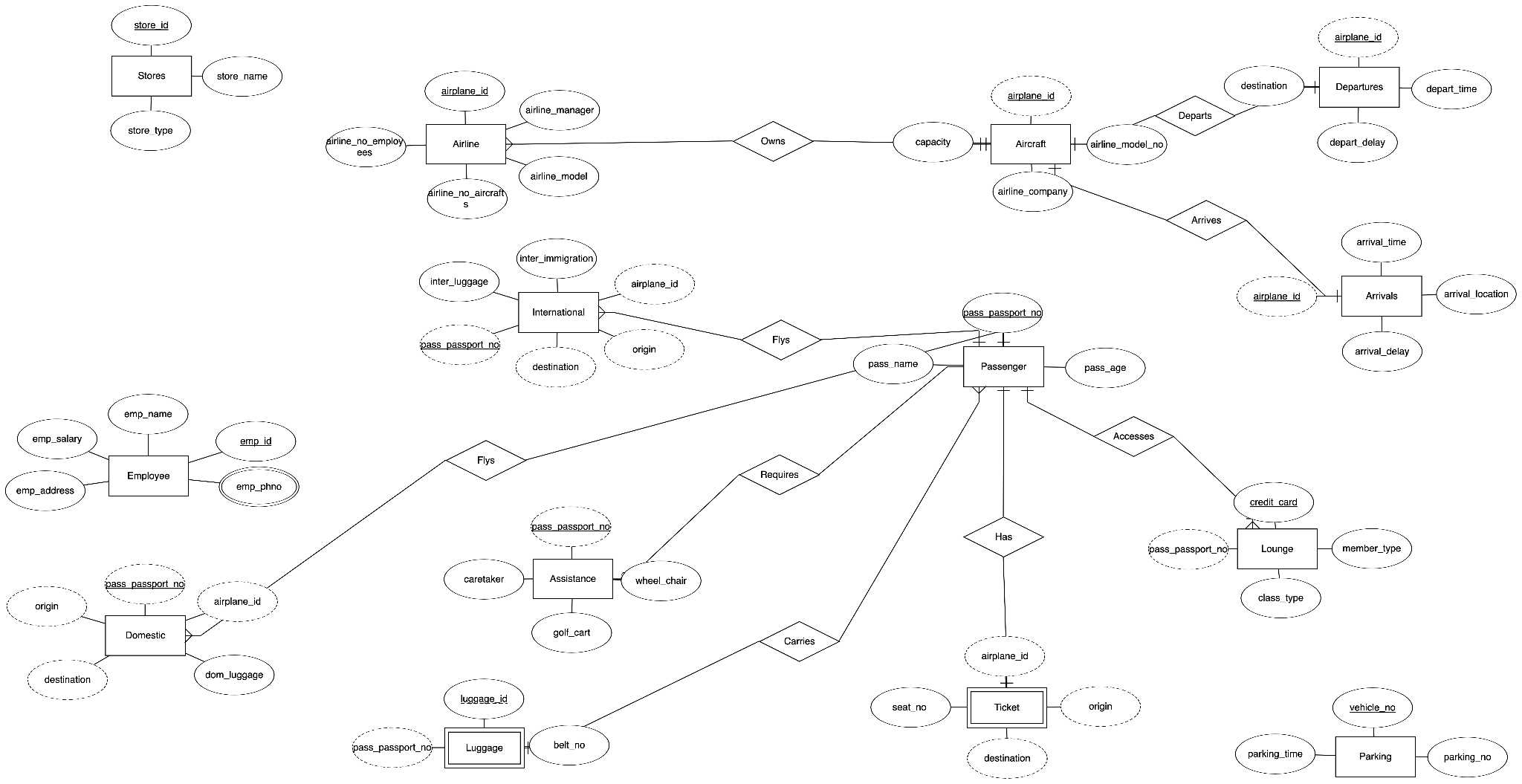
Describe all relationships among various entities. Also, specify the cardinality and participation for all relationships.

The Database contains the following Tables:

**Relational Model**

1. PASSENGER
2. pass\_passport\_no [Primary Key]
3. pass\_age
4. pass\_name
5. AIRLINE:
6. airplane\_id [Primary Key]
7. airline\_manager
8. airline\_model\_no
9. airline\_no\_aircrafts
10. airline\_no\_employees
11. ARRIVALS:
12. airplane\_id [Foreign Key]
13. arrival\_time
14. arrival\_location[Primary Key]
15. arrival\_delay
16. DEPARTURES
17. airplane\_id [Foreign Key]
18. depart\_time
19. depart\_delay
20. destination
21. TICKET:
22. seat\_no
23. origin[Foreign Key]
24. destination[Foreign Key]
25. airplane\_id[Foreign Key]
26. STORES:
27. store\_id [Primary Key]
28. store\_name
29. store\_type
30. INTERNATIONAL:
31. pass\_passport\_no[Foreign Key]
32. inter\_luggage
33. inter\_immigration
34. airplane\_id[Foreign Key]
35. destination[Foreign Key]
36. AIRCRAFT:
37. airplane\_id [Foreign Key]
38. airline\_model\_no
39. airline\_company
40. capacity
41. LOUNGE:
42. credit\_card [Primary Key]
43. member\_type
44. class\_type
45. pass\_passport\_no[Foreign Key]
46. ASSISTANCE:
47. pass\_passport\_no [Foreign Key]
48. wheel\_chair
49. golf\_cart
50. caretaker
51. LUGGAGE:
52. luggage\_id [Primary Key]
53. belt\_no
54. pass\_passport\_no[Foreign Key]
55. PARKING:
56. vehicle\_no [Primary Key]
57. parking\_no
58. parking\_time
59. DOMESTIC:
60. pass\_passport\_no [Foreign Key]
61. airplane\_id[Foreign Key]
62. destination [Foreign Key]
63. origin
64. EMPLOYEE:
65. emp\_id [Primary Key]
66. emp\_name
67. emp\_address
68. emp\_phno
69. emp\_salary

**III. Entity Relationship Diagram**



**V. Normalization**

All the tables are in 3NF as there are no partial or transitive dependencies.

**VI. SQL Queries**

* **Create the tables**

create database airport\_management;

use airport\_management;

CREATE TABLE IF NOT EXISTS PASSENGER (

PASS\_NAME varchar(50) NOT NULL,

PASS\_AGE int(2) NOT NULL,

PASS\_PASSPORT\_NO int(10) NOT NULL,

PRIMARY KEY (PASS\_PASSPORT\_NO));

CREATE TABLE IF NOT EXISTS AIRLINE (

AIRPLANE\_ID VARCHAR(10),

AIRLINE\_MANAGER VARCHAR(20),

AIRPLANE\_MODEL\_NO INT,

AIRLINE\_NO\_AIRCRAFTS INT,

AIRLINE\_NO\_OF\_EMPLOYEES INT,

PRIMARY KEY (AIRPLANE\_ID));

CREATE TABLE ARRIVALS(

AIRPLANE\_ID VARCHAR(10),

ARRIVAL\_TIME INT(10),

ARRIVAL\_LOCATION VARCHAR(20),

ARRIVAL\_DELAY INT(10),

PRIMARY KEY (ARRIVAL\_LOCATION),

FOREIGN KEY (AIRPLANE\_ID) REFERENCES AIRLINE (AIRPLANE\_ID));

CREATE TABLE DEPARTURES (

AIRPLANE\_ID VARCHAR (10) ,

DEPART\_TIME INT,

DEPART\_DELAY VARCHAR(10),

DESTINATION VARCHAR (20),

PRIMARY KEY(DESTINATION),

FOREIGN KEY(AIRPLANE\_ID) REFERENCES AIRLINE (AIRPLANE\_ID));

CREATE TABLE IF NOT EXISTS TICKET (

AIRPLANE\_ID VARCHAR(10) ,

SEAT\_NO int NOT NULL,

ORIGIN varchar(50) NOT NULL,

DESTINATION varchar(50) NOT NULL,

FOREIGN KEY (ORIGIN) REFERENCES ARRIVALS(ARRIVAL\_LOCATION),

FOREIGN KEY (DESTINATION) REFERENCES DEPARTURES(DESTINATION),

FOREIGN KEY (AIRPLANE\_ID) REFERENCES AIRLINE (AIRPLANE\_ID));

CREATE TABLE STORES(

STORE\_ID INT(15) PRIMARY KEY,

STORE\_NAME VARCHAR(15),

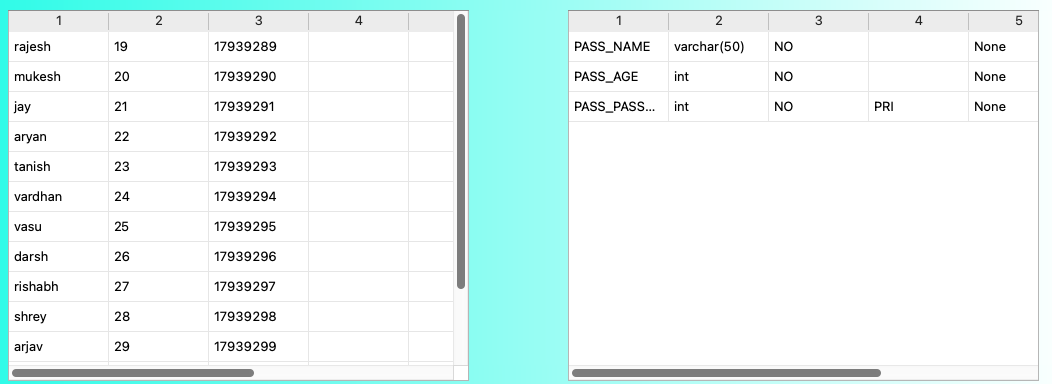
STORE\_TYPE VARCHAR(10));

* Populate the tables (insert some meaningful data, at least 10 tuples for each relation)

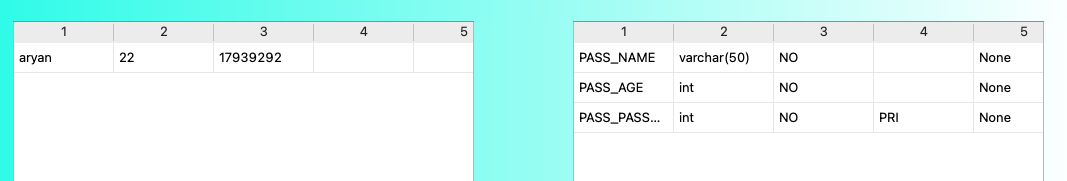
Data insertion was done using csv files

* Run SQL queries (minimum 15) covering **all concepts** learned in the class

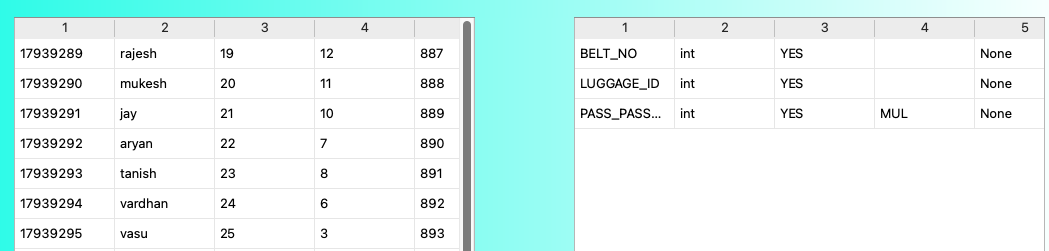
select\*from passenger



select\*from passenger where pass\_age=22



select\*from passenger natural join luggage



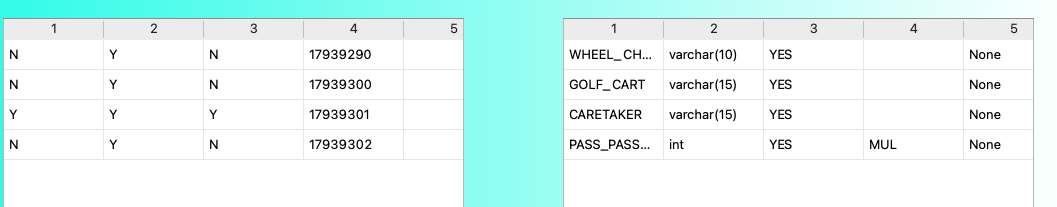
select\*from stores



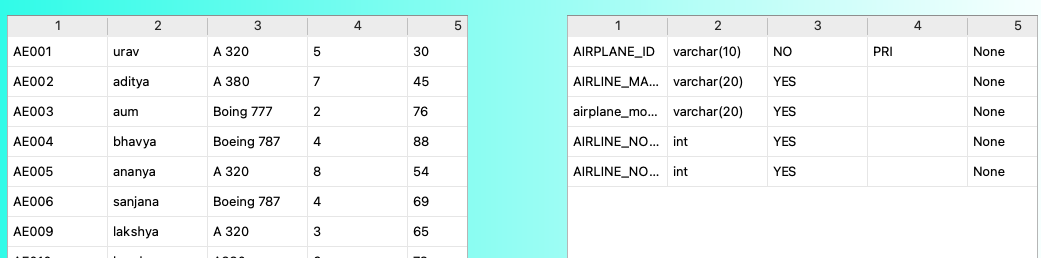
select\*from stores where store\_type='apparel'



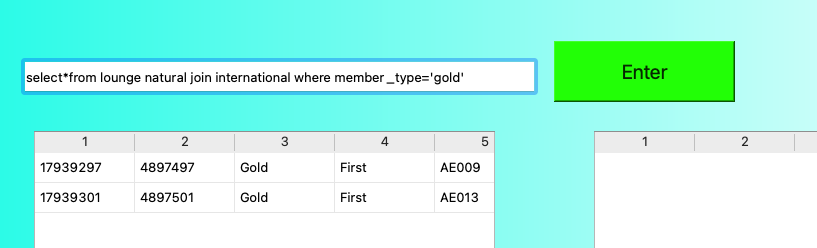
select\*from assistance where golf\_cart='Y'



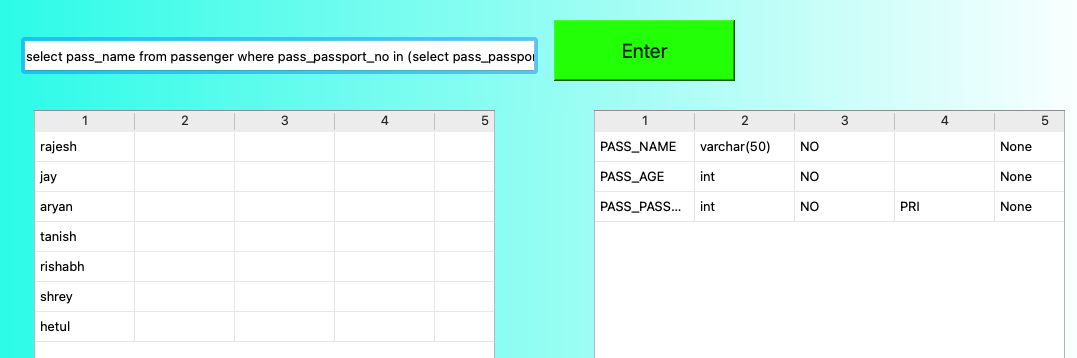
select\*from airline natural join aircraft



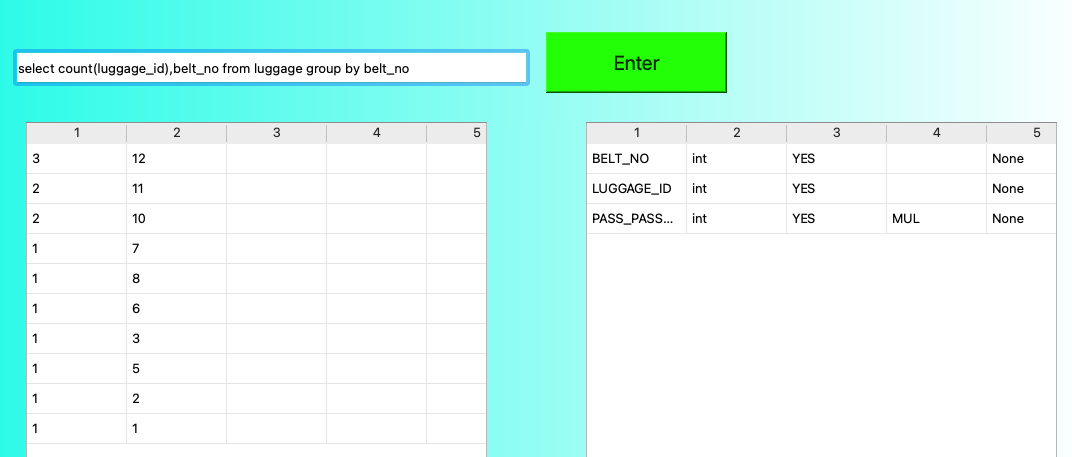
select\*from lounge natural join international where member\_type='gold'



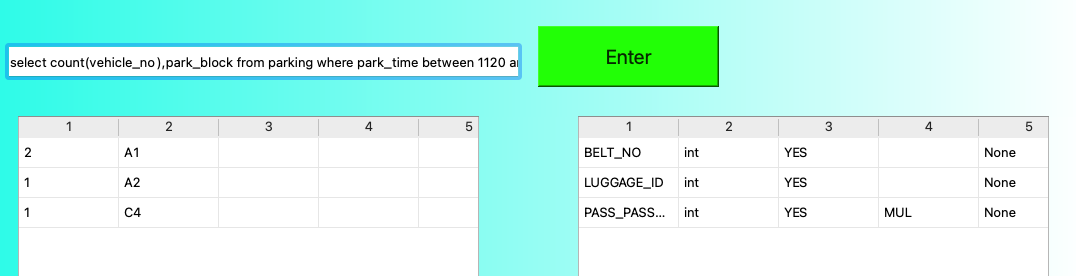
select pass\_name from passenger where pass\_passport\_no in (select pass\_passport\_no from assistance where wheel\_chair='Y')



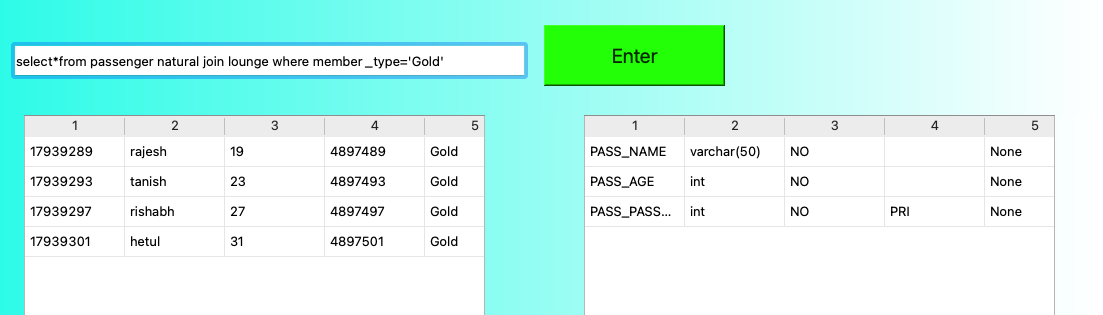
select count(luggage\_id),belt\_no from luggage group by belt\_no



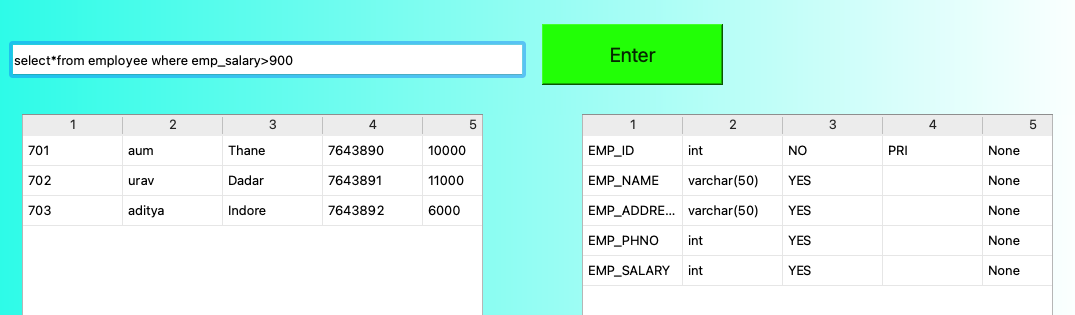
select count(vehicle\_no),park\_block from parking where park\_time between 1120 and 1630 group by park\_block



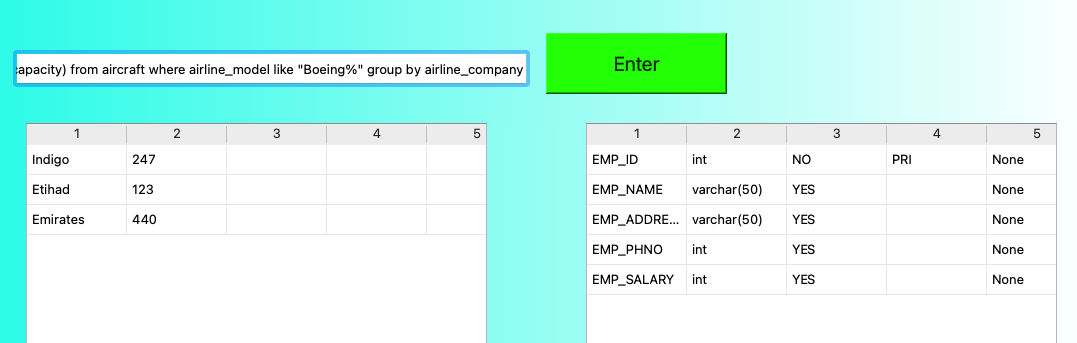
select\*from passenger natural join lounge where member\_type='Gold'



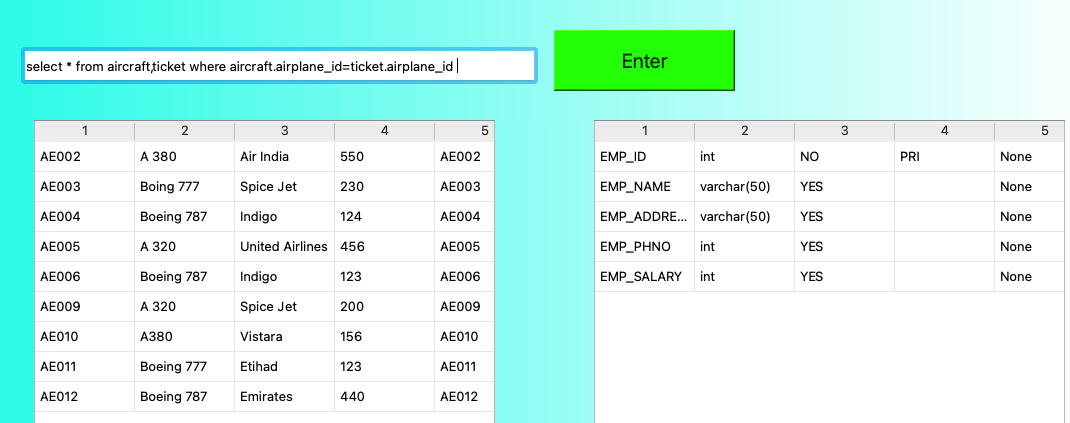
select\*from employee where emp\_salary>900



select airline\_company, sum(capacity) from aircraft where airline\_model like "Boeing%" group by airline\_company



select \* from aircraft,ticket where aircraft.airplane\_id=ticket.airplane\_id



**VI. Project demonstration**

* Tools/software/ libraries used
* Screenshot and Description of the Demonstration of project ( If GUI is made)

Tools:

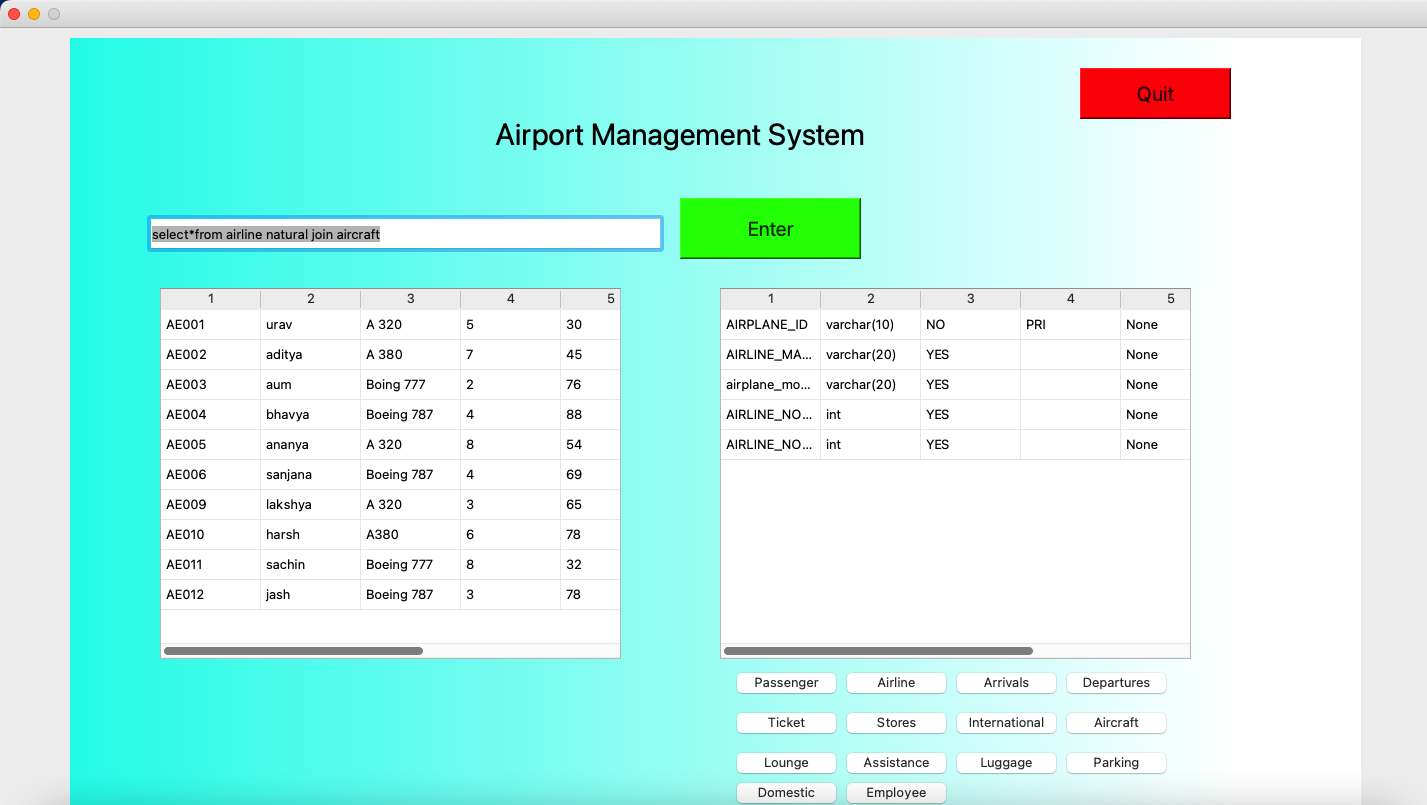
1. MySQL
2. Python

Software:

1. MySQL Workbench
2. PYcharm

Libraries:

1. Python:

* mysql.connector
* PyQt5
* sys
* 

We’ve created an input box which will be used to take the input from the user and will execute after the user has pressed the “Enter” button. There are multiple buttons with the names of the entities which display the description of the respective entities. The quit button is used to exit the program.

**VII. Learning from the Project**

* How this project helped you?

This project really helped us understand the various concepts of Database Management Systems. We were able to implement every single thing which was taught to us in class. This project is built upon the ideas of each and every member of the group. All of our doubts and queries regarding MySQL were resolved after contributing towards this project.

* What new aspects did you learn?

One of the new things which we learnt is the infamous Python GUI. We learned the python library PyQt5 which enabled us to create fantastic new windows to help display our project in a more aesthetic way. We learned how to connect MySQL with Python which helped us understand various concepts of Object Oriented Programming because we created a separate function for each query in python.

These are a few techniques which we understood after completing this project.

**VIII. Challenges Faced**

The greatest challenge we faced was about Python GUI. For every query we had to create a separate function and a window, the placement of the keys and their execution.

We divided the queries amongst ourselves. We faced issues in the connection and the relation of the tables we created with primary and foreign keys.

**IX. Conclusion**

* What are the key takeaways from the project?

The key takeaways from this project was a broader and better understanding of MySQL, also to implement the learnings taken from the classroom. This project also helped us understand the relations and how the tables should be interrelated and how we can make the management system more efficient and reliable. Running the queries and getting the desired output was important for us to understand how the attributes interacted with each other, especially the primary and foreign keys; they played a salient role for the overall connectivity of the database.

We also learned about the relations used in real-life Airport management systems and how everything comes together, to make our project a replica of an actual Database management system. We also learned about Normalization and redundancies that may have caused additional problems for us, and how the anomalies could be eliminated. This project was very crucial for our understanding and implementation of SQL in real-life and beyond. Our project also helped us to learn more about the Python GUI which is an important language for our current course. The interaction between the frontend and backend gave us a broader understanding of the two languages and their connection with each other.