UNIVERSITY OF ECONOMICS AND LAW

FACULTY OF INFORMATION SYSTEMS

MIDTERM PROJECT REPORT

DATABASE

TOPIC: FLIGHT BOARDING MANAGEMENT SYSTEM

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CHAPTER I: INTRODUCTION

1. Why did I choose this topic?

The aviation industry in its very own sense is highly dynamic and fast paced. The kind of exposure that this industry offers, not just pertaining to work spheres but also to every nook and corner of the world is the most attractive thing about it. You can travel to different places, indulge in the unique cultures of every place, meet new people and build connections.

The aviation sector revolves around very complex and high-end precision technology and harbours all the latest Industry 4.0 technology trends. As it deals with engineering, technology is a requisite in the Aerospace and Aviation Industry. It not just harbours technology, it also has tremendous opportunities for technology innovations and inventions. All aspects of this industry like the airports, airlines, ground-support etc., deal with technology and digital systems which are not just modern but are also quite exclusive. This feature of the aviation and aerospace sector attracts a lot of people, especially youngsters with a love for technology. Exploring the current technologies all at one place, that too first hand, is an appealing factor to the millenials.

The aviation industry has evolved considerably over the last four decades. Airport sponsors as well as airport related businesses are evolving to meet changing passenger demand and build brand recognition around the passenger experience. Airports are the infrastructure where providers of aviation related services (the sellers) meet the users of aviation related services (the buyers); hence an airport is a specialized market. These specialized services, along with safety and regulatory requirements, have increased the need for experienced, professional management across all segments of airport operations. Nowadays, the *aviation industry, like several other sectors, is facing a crisis in the wake of the COVID-19 pandemic.* The airline industry will wear the scars of the coronavirus pandemic for a very long time. So that, a good fight boarding management is really necessary for aviation companies to attract passengers

2. Target

Design a database about flight boarding management systems to input, edit, and delete data about passengers, employees, flight, flight schedule, or other information that is necessary for boarding. So from this database enterprise can control or access and retrieve useful information about boarding.

3. Objective

Create a data flow diagram to represent the flow of data through the boarding process and provide information about the inputs and outputs of each entity and process itself

Build and design a complete and comprehensive business rule that as close to reality as possible

From the business rule, design a suitable EER full of entity, relationship, and attribute

Create a logical design to ensure that all attributes are fully dependent on the identified primary key and that the tables are in at least the third normal form (3NF).

Create a physical design and query by sql to get data for the report

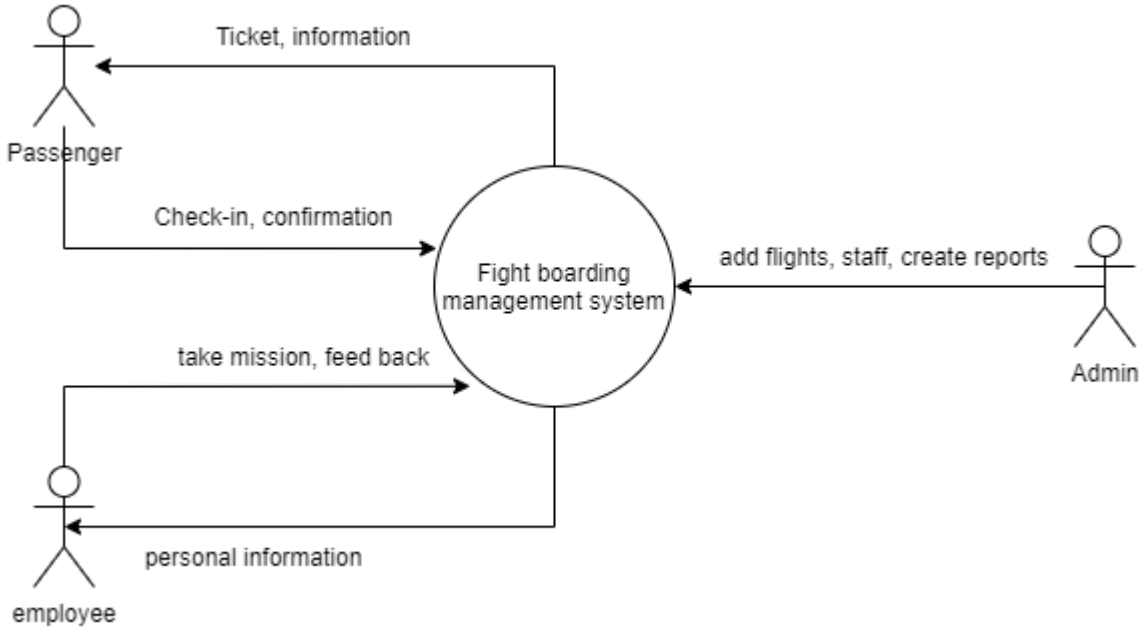
4. Business model

General description of the company activities:

The company offers domestic flights, which means the flight will travel within Vietnam.

Hope that Flights will bring joyfulness, customer satisfaction by providing luxurious and exceeding expectation services with friendly smiles.

4.1. Dfd level 0



Check-in server will be one who input data for the system. And the manager will use it for human resource and passenger management.

System manager will be administration of the system

In fact, there will be many parties involved in the process of using passenger flight services, including airline, services on the ground, to parts of the terminal.
However, I divided into main groups of objects:

1. Passenger
2. Employee and others

This project will mostly focus on passengers

4.1.1. Use case of passenger:

Step 1: Check-in
Passenger arrive at the airline's check-in area to check-in within 40 minutes before departure . If passengers have goods on consignment they must check-in at the baggage check-in counter and complete it 3 hours before the plane departure.
Goods must comply with these following regulations:
First class/Business class: 30kg check-in and 2 carry-on pieces, smaller than 119x119x81(cm)

Economy class: 20 kg check-in and 1 carry-on, smaller than 119x119x81(cm).

After that, the check-in staff will check tickets and related documents. If there is anything against the regulations it will result in passengers not being able to pass through the ticket gates. On the contrary, the passenger is returned the ticket, ID card, and boarding pass

Step 2: Do exit procedures

Because Flights for domestic passengers, they will go straight though the next baggage check and security.

Step 3: check baggage and security

Security will check baggage and security to ensure security. If there is anything against the rules will result in the passenger being denied flight. Else, the passenger will be given boarding pass and taken to the waiting room.

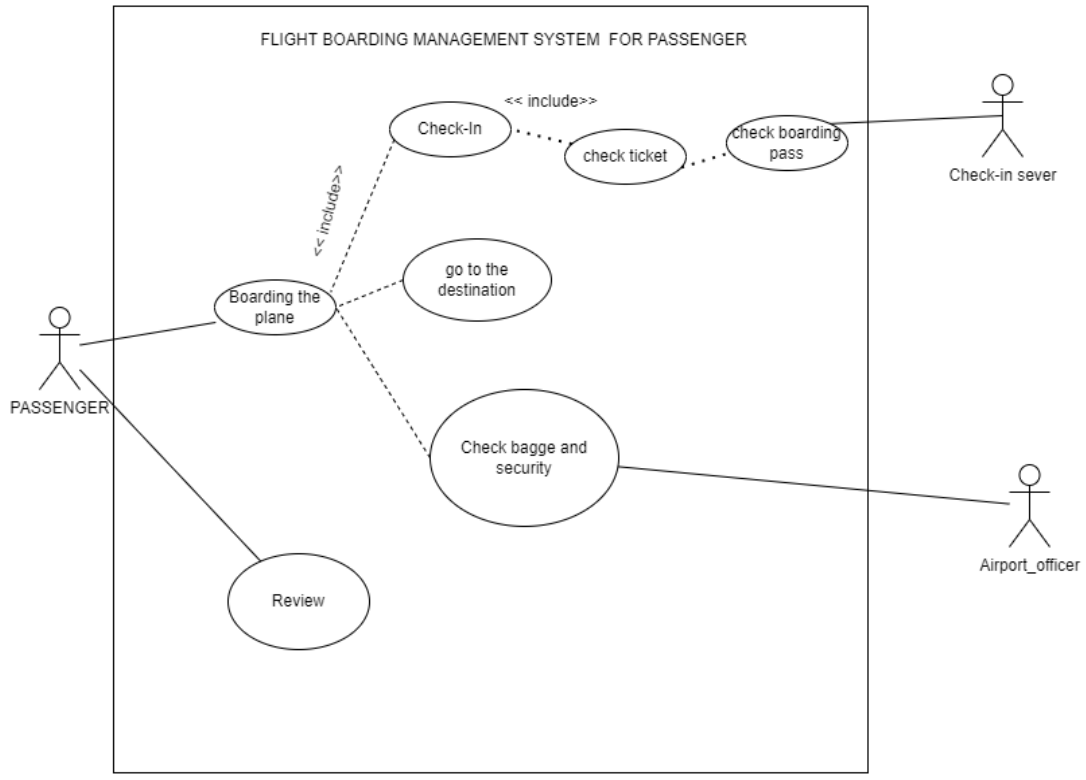
Step 4: Get on the plane

The customs department moves passengers on board and must be on board at least 15 minutes before take-off time. Otherwise, the passenger will have their flight canceled.

Flight attendants will check the boarding pass, guide the passengers to the plane and start the journey

Step 5: Review the Flight (optional)

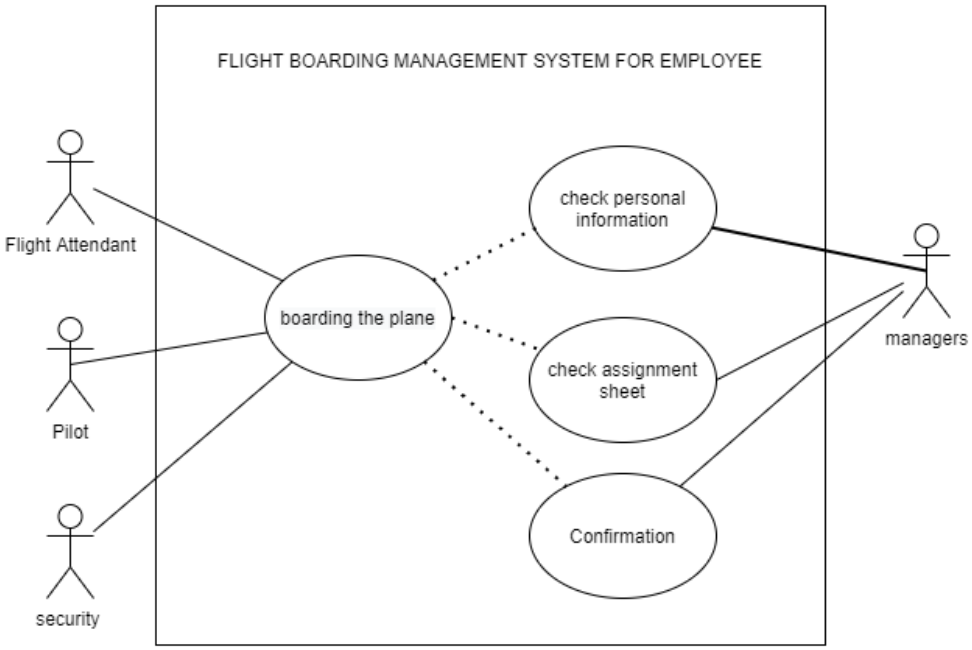
Passenger make some reviews to improve the quality of the flight.



4.1.2. Use case of employee

Before boarding, the whole crew meets and the content is related to flight information. the captain will review the flight schedule and any safety concerns, the administrator will create schedules and assign groups to specific flights.

Each employee will work in a certain group, and there are 3 types of group for 3 jobs: security, pilot, flight attendant.



CHAPTER 2: DESIGN ENTITY RELATIONSHIP MODEL

2.1. About the business:

The system manages related information for boarding management

Now, the company have many planes and 3 types: Boeing, Airbus, and MD

All are domestic flights, and these flights are deployed at 15 airports in 15 largest cities in Vietnam. When the airplane move from one airport to another, it will be consider as a Flight

The administrator will assign employees for each Flight. There are many groups which have 3 types of Job: Pilot, Flight Attendant, and Security. And each employee works permanently for a group. All groups must have a leader and an optional vice leader.

Each aircraft has 3 cabins for passengers including: First Class, Economy Class, and Business Class.

Depend on distance, seasons and type of class there will have different price for a Ticket

2.2. Defining Entity

Airplane is the means of transportation for the flight

Employee represents the employee working on the flight

Passenger represents for a customer who buy ticket to board flight

Ticket is a ticket owned by the passenger with complete information like customer id, flight number etc

Groups represents for a specific work's group, each group has a certain number of employees who working on a particular job

Flight represents for a flight that have their own attribute, is created to identify specific information

BoardingPass represents for each passenger's boarding pass, which is required for passengers to have the right to boarding flight

ClassSeat: A flight has 3 types of seat First Class, Business class, Economy ClassSeat and in a flight each seat will have its price.

2.2.1. Defining attribute

Flight		
Attribute Name	Define	type
FlightID	identifier of the flight	identifier
DepartureDate	date that the flight departure	mandatory
DepartureTime	the time that the flight departures	mandatory
ArrivalTime	the time that the flight arrives	mandatory
fromWhere	Where the flight takes off	mandatory
toWhere	Where the flight landed	mandatory

Passenger

PassengerID	identifier of the flight	identifier
FirstName	First name of the passenger	mandatory
Lastname	Last name of the passenger	mandatory
Email	Email of the passenger	mandatory
PhoneNumber	Phone number of the passenger	mandatory
Frequent_flyer_number	a number member written on card for the passenger loyalty passenger	can be null

Groups		
Group ID	Identifier of the group	identifier
Leader ID	Leader ID of the group	Mandatory
Job	Job of Each group	Mandatory
viceleaderID	Vice leader ID of the group	Mandatory

Airplane		
AirplaneID	Identifier of the airplane	identifier
ModelNumber	the number of the airplane's model, each manufacture has its own number model	Mandatory
FS	total number of first seat	Mandatory
BS	total number of business class seat	Mandatory
ES	total number of economy	Mandatory

	class seat	
Name	Name of the airplane	Mandatory

Employee		
EmployeeID	Identifier of the employee	identifier
FirstName	First name of the employee	mandatory
LastName	Last name of the employee	mandatory
YearOfBirth	Year that the employee was born	mandatory
Gender	gender of the employee	mandatory
Email	e-mail of the employee	mandatory

Ticket		
TicketID	Identifier of the ticket	Identifier
fromWhere	departure of the passenger own the ticket on board	mandatory
toWhere	Destination of the passenger own the ticket	mandatory
createAt	The time that the ticket was created	mandatory
Price	the price the the ticket	mandatory
ClassSeatID	identifier of the class	foreign key
status	The validation of the ticket	mandatory

bookingPlatform	If the ticket book online, What platform was the ticket booked	Optional

Boarding Pass		
boardingPassID	ID of boarding pass	Mandatory
Create-at	Time the boarding created	Mandatory
gate	indicating which gate the passenger needs to enter	mandatory

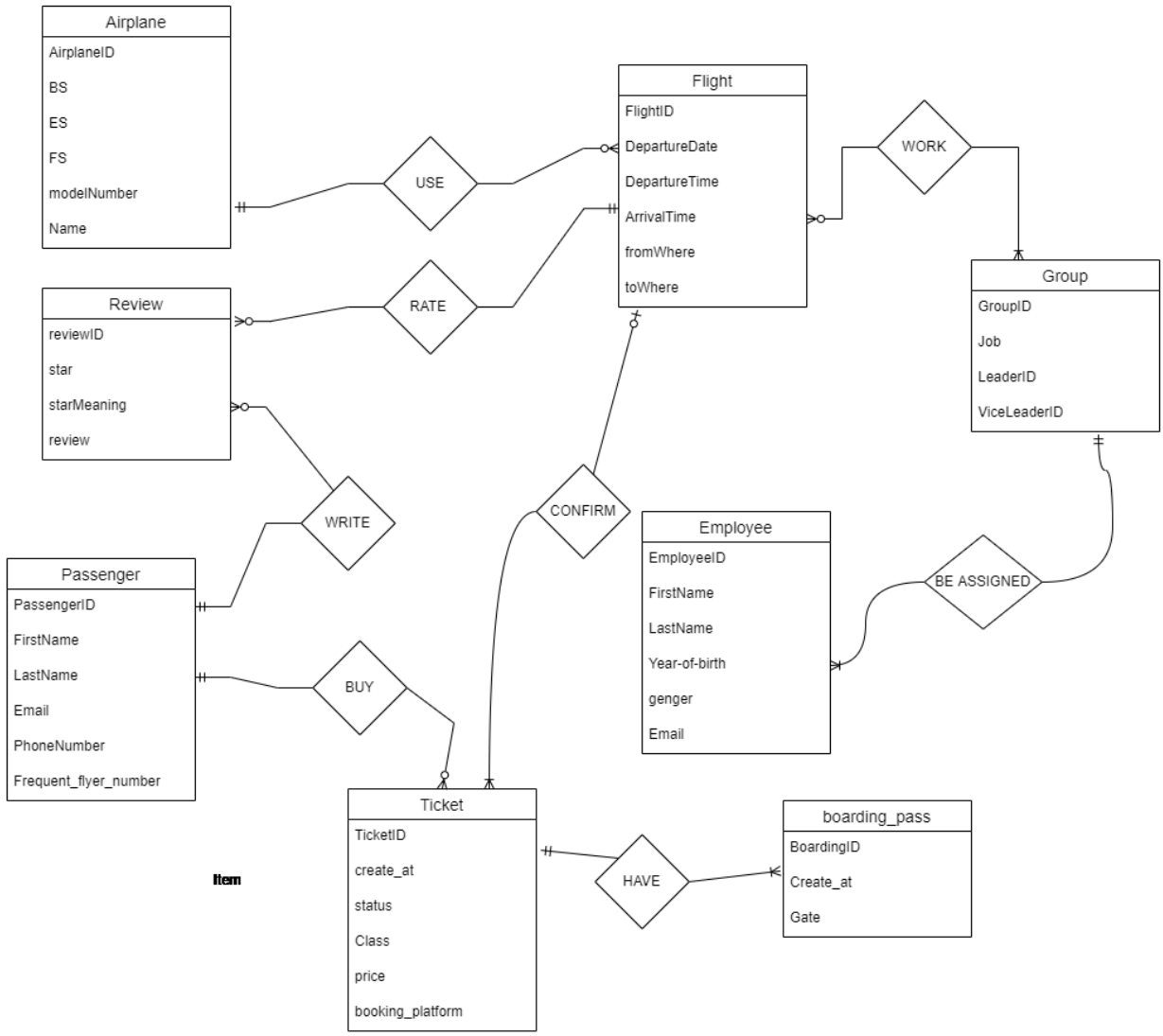
Review		
ReviewID	ID of the review	Identifier
Review	comment of passenger	optional
Star	there are 5 star	mandatory
StarMeaning	meaning of each star	mandatory

2.3. The requirement for the system (Business rules):

- The company has many airplanes, so an **airplane** can be **used for** multiple optional **flights**, and a **flight** must **use** only one **airplane** to transport at a time.
- **A flight** has many passengers, and **tickets** will be an entity for the relationship between passenger and Flight. So **a flight** must **have** multiple **tickets**, and **a ticket** can be **boarding on** a flight or can not board any **flight** because the ticket can be delayed or canceled. **Passengers** have multiple optional **tickets** and **a ticket** can **belong to** only one **passenger.**
- **Reviews** for passengers evaluate quality of the flight so, **a Passenger has** multiple optional **reviews** and **a Flight** can also have multiple optional **flights**. But a **Review** must be **written by** one **passenger** and **belong to** a **flight**.

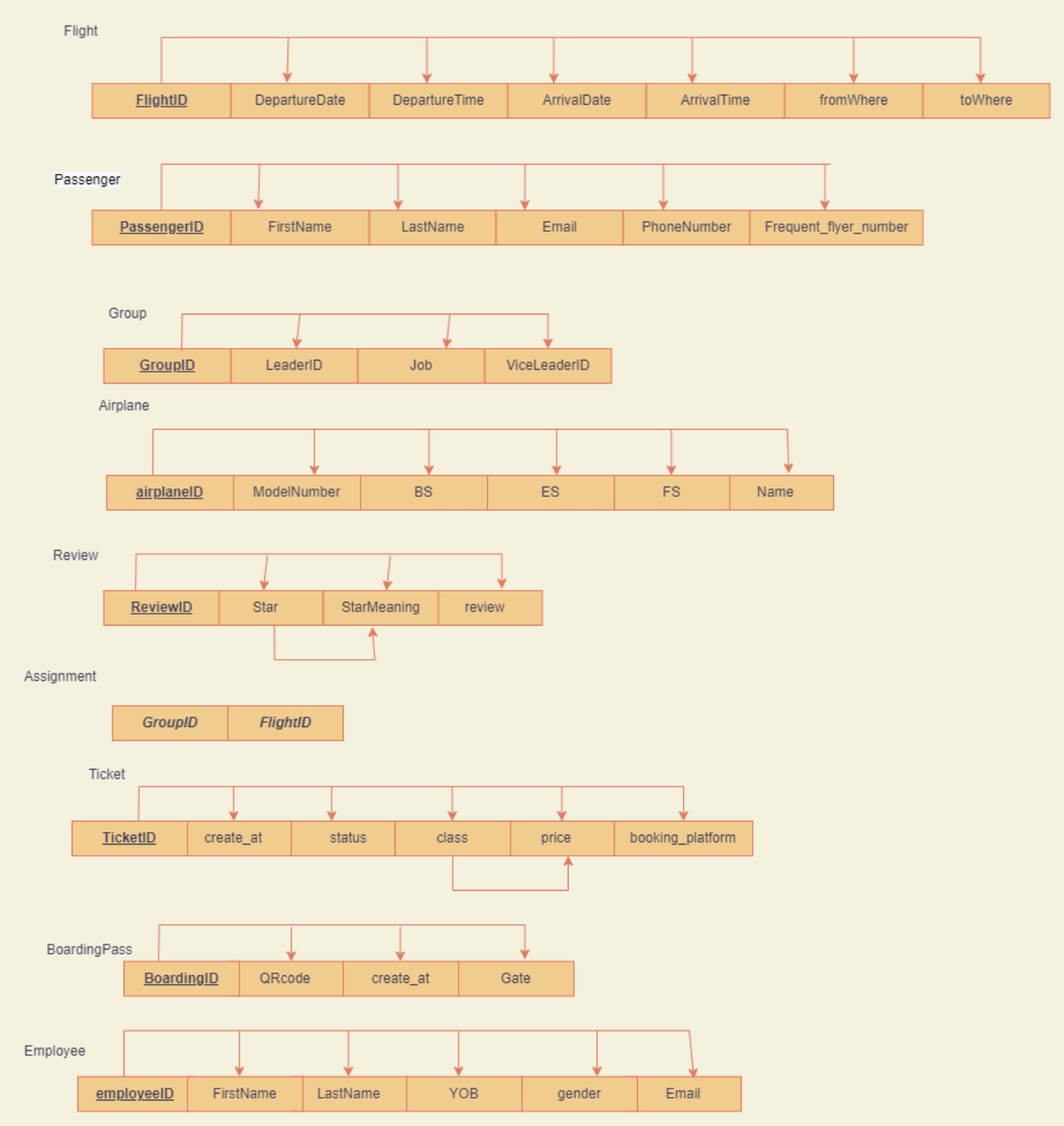
- **An Employee** must be **in** a **group**, and **a group** must **have** many **employees**. **A flight** must **have** many **groups** and **a group works for** multiple optional **Flights.**
- **A ticket** can have many **boarding passes** to board a flight at many different gates. But a **boarding pass** must for only one **ticket**

2.3.1. ERR:

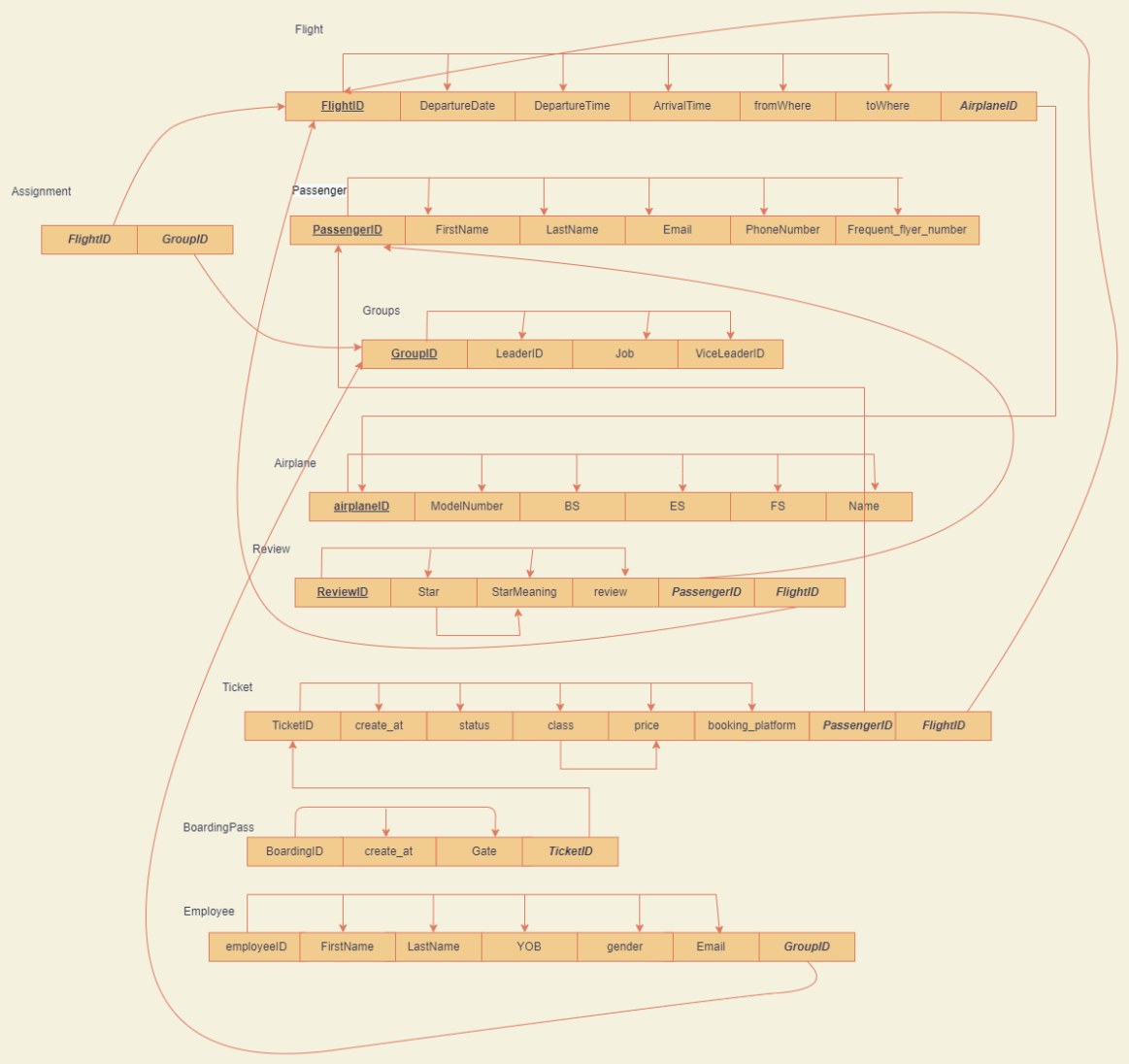


CHAPTER 3: LOGICAL DESIGN

3.1. Functional dependency diagram

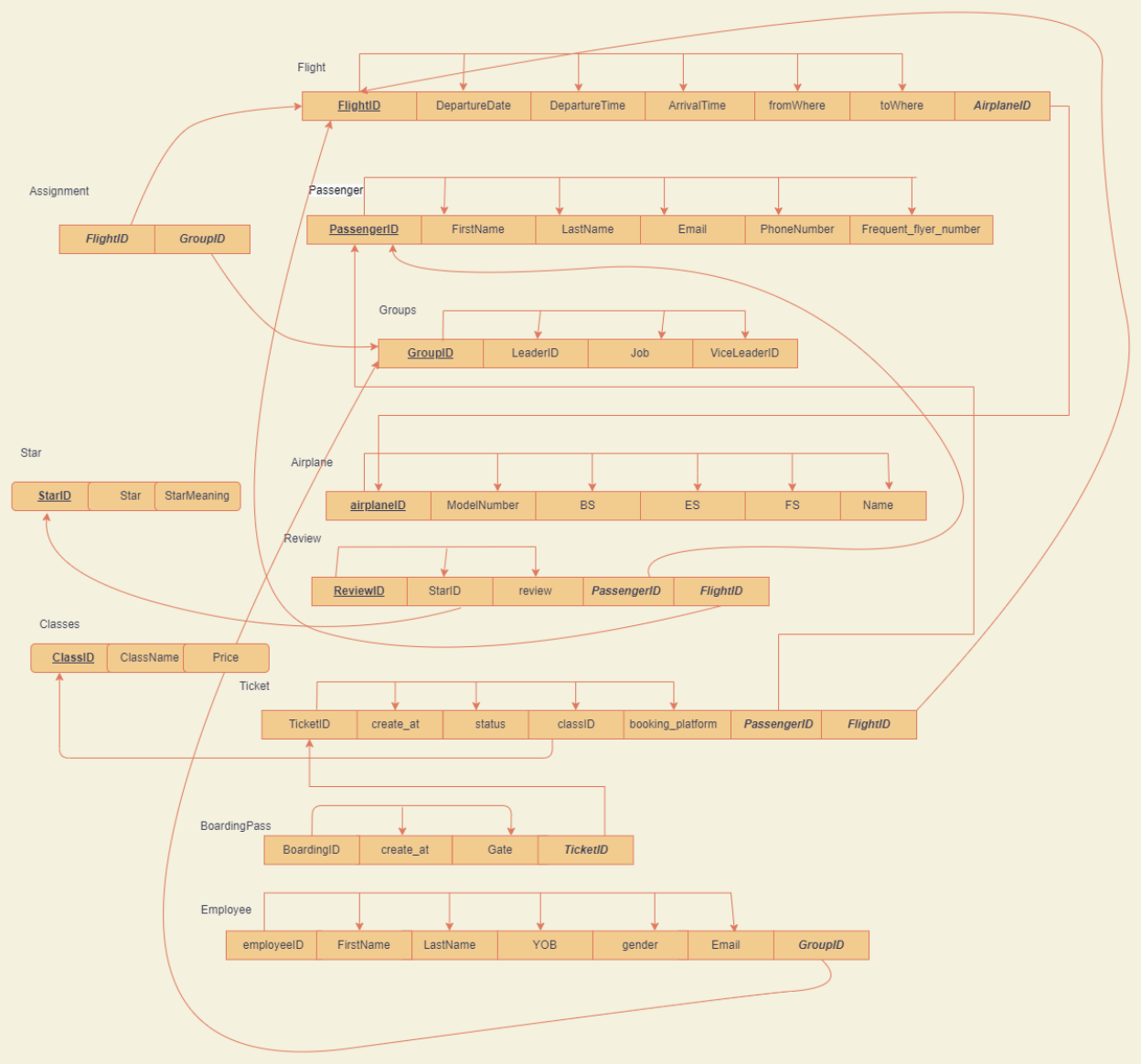


3.2. Logical design 1NF:



Comment: Because relationship between Group and Flight is many to many. So, I create an entity relationship – Assignment – represents that which flight that the group assigned to.

3.3. 3NF:



Comment: There are fuctional dependencies in the entity Ticket (We can know star meaning by number of stars) and entity Ticket (the price of the ticket base on the class Seat)

CHAPTER 4: PHYSICAL DESIGN

4.1 Define data type

Flight

Attribute	Data Type

Passenger

PassengerID	Varchar(10)

FlightID	Varchar(15)
DepartureDate	Date
DepartureTime	Time
ArrivalTime	Time
fromWhere	Varchar(50)
toWhere	Varchar(50)

Employee

EmployeeID	varchar(10)
FirstName	Nvarchar(15)
LastName	Nvarchar(15)
YearOfBirth	Int
Gender	Varchar(7)
Email	Varchar(50)

Ticket

TicketID	Varchar(15)
createAt	datetime
Price	float
Class	Varchar(50)
status	Varchar(20)
bookingPlatform	Varchar(40)

FirstName	Nvarchar(15)
Lastname	Nvarchar(15)
Email	Nvarchar(15)
PhoneNumber	int
Frequent_flyer_number	int

Groups

Group ID	Varchar(10)
Leader ID	Varchar(10)
Job	Varchar(20)
viceleaderID	Varchar(10)

Airplane

AirplaneID	Varchar(10)
ModelNumber	int
FS	int
BS	Int
ES	Int
Name	Varchar(20)

Review

ReviewID	Int
Review	Nvarchar(200)

BoardingPass

boardingPassID	int
Create-at	time
gate	Int

Star	int
StarMeaning	Varchar(20)

4.2. Create Database and Table (create attribute for each entity)

```
create database Boarding2
go
use Boarding2
create table Passenger
(
 PassengerID varchar(10),
 FirstName nvarchar(15) not null,
 LastName nvarchar(15) not null,
 Email nvarchar(50) not null,
 PhoneNumber int not null,
 Frequent_flyer_number int,
 primary key (PassengerID)
)
create table Employee
(
 EmployeeID nvarchar(10),
 FirstName nvarchar(15) not null,
 LastName nvarchar(50) not null,
 PhoneNumber int not null,
 YearOfBirth  int not null,
 Gender varchar(7) not null,
 Email varchar(50) not null,
 GroupID varchar(10) not null,
 primary key (EmployeeID)
```

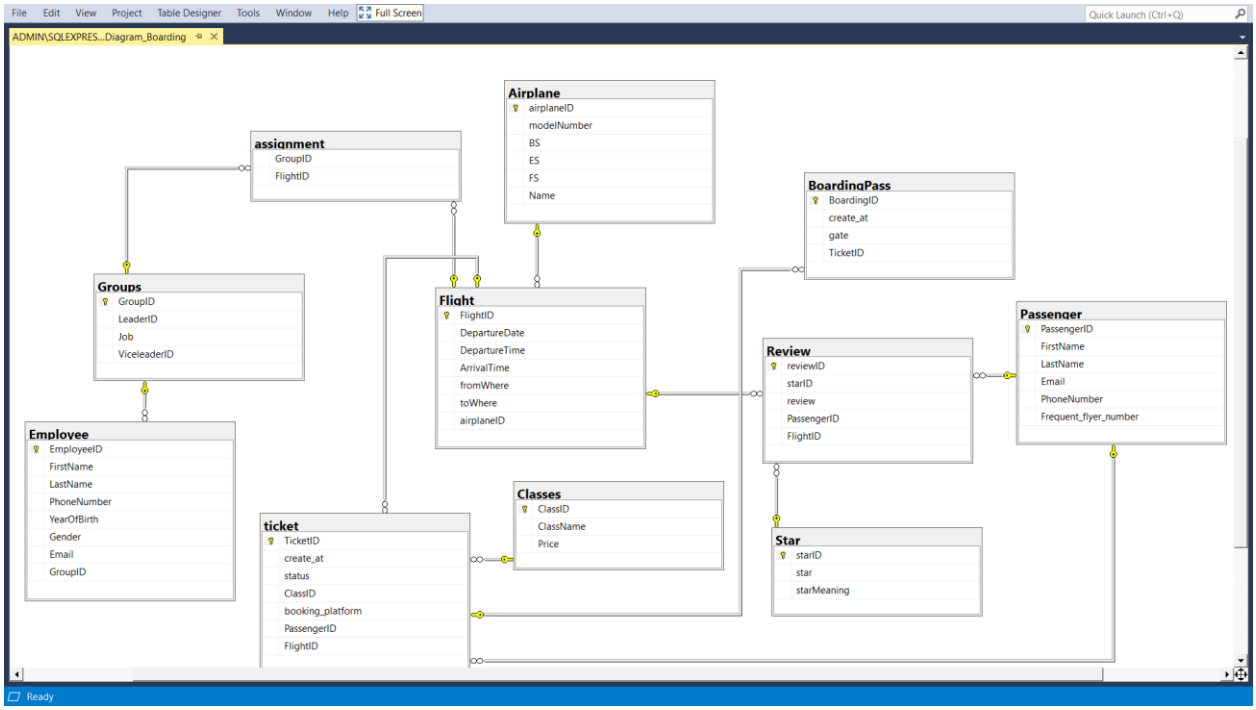
```
)
create table Flight
(
FlightID varchar(10),
DepartureDate date not null,
DepartureTime time not null,
ArrivalTime time not null,
fromWhere varchar(50) not null,
toWhere varchar(50) not null,
airplaneID varchar(10) not null,
primary key (FlightID)
)
create table Groups
(
GroupID varchar(10) primary key,
LeaderID varchar(10) not null,
Job  varchar(20) not null,
ViceleaderID varchar(10)
)
create table Airplane
(
airplaneID varchar(10) primary key,
modelNumber int not null,
BS int not null,
ES int not null,
FS int not null,
Name varchar(20) not null
)
create table Review
(
reviewID int identity (1,1) primary key,
starID int  not null,
review nvarchar(200) ,
PassengerID varchar(10) not null,
```

```
FlightID varchar(10) not null
)
create table Star
(
starID int primary key not null,
star int not null,
starMeaning nvarchar(20) not null
)
create table Classes
(
ClassID int primary key ,
ClassName varchar(50) not null,
Price float not null,
)
create table ticket
(
TicketID varchar(15) primary key,
create_at datetime not null,
status varchar(20) default 'validity',
ClassID int ,
booking_platform varchar(40) ,
PassengerID varchar(10) not null,
FlightID varchar(10) not null,
constraint FK_Ticket_Classes FOREIGN KEY (ClassID)REFERENCES Classes(ClassID),
constraint FK_Ticket_Passenger foreign key(passengerID) references
Passenger(PassengerID),
constraint FK_Flight_Passenger foreign key(FlightID) references Flight(FlightID)
)

create table BoardingPass
(
BoardingID int primary key,
create_at time not null,
gate int not null,
```

```
TicketID varchar(15)
)
create table assignment
(
GroupID varchar(10) not null,
FlightID varchar(10) not null,
constraint Group_PK foreign key (groupID) references groups(groupID),
constraint Flight_PK foreign key(FlightID) references Flight(FlightID)
)
ALTER TABLE Flight
ADD CONSTRAINT FK_Flight_Airplane
FOREIGN KEY (AirplaneID)
REFERENCES Airplane(AirplaneID)

ALTER TABLE Review
ADD CONSTRAINT FK_Review_Flight
FOREIGN KEY (FlightID)
REFERENCES Flight(FlightID)

ALTER TABLE Review
add constraint FK_Review_Passenger
FOREIGN KEY (PassengerID)
REFERENCES Passenger(PassengerID)

ALTER TABLE review
add constraint FK_Star_Review
FOREIGN KEY (StarID)
REFERENCES star(StarID)

ALTER TABLE BoardingPass
add constraint FK_BoardingPass_Ticket
FOREIGN KEY (TicketID)
REFERENCES Ticket(TicketID)
```

```
ALTER TABLE Employee
add constraint FK_Employee_Groups
FOREIGN KEY (GroupID)
REFERENCES Groups(GroupID)
```

4.2.1. The diagram :



4.2.2. Insert data:

```
insert into Airplane values  ('A310', '11', '16', '136', '35', 'Airbus')
insert into Airplane values ('A320', '13', '18', '130', '39', 'Airbus')
insert into Airplane values ('B727', '01','18', '136', '31', 'Boeing')
insert into Airplane values ('B747', '03','15', '137', '33', 'Boeing')
insert into Airplane values ('MD10', '15', '19', '130', '31', 'MD')
insert into Airplane values ('MD92', '10', '33', '136', '34', 'MD')
insert into Airplane values ('B757', '12', '40', '149', '26', 'Boeing')
insert into Airplane values ('A330', '02', '10', '90', '7', 'Airbus')
insert into Airplane values ('A340', '09', '12', '77', '18', 'Airbus')
insert into Airplane values ('B767', '08','48', '146', '21', 'Boeing')

 select * from Airplane
```

```
INSERT INTO Flight(FlightID,FromWhere,ToWhere,DepartureTime,ArrivalTime,
DepartureDate, airplaneID)
VALUES
('100','Hanoi','HoChiMinh','08:00','17:50','11-6-2020','B727'),
('112','HaiPhong','NhaTrang','14:00','18:07','12-6-2020','B727'),
('121','HoChiMinh','NhaTrang','07:00','09:13','11-6-2020','B727'),
('122','NhaTrang','QuyNhon','08:30','10:19','7-17-2020','B727'),
('206','DaNang','Hue','09:00','11:40','3-21-2020','MD10'),
('330','CanTho','BienHoa','16:00','18:53','4-8-2020','MD10'),
('334','BienHoa','NhaTrang','12:00','14:14','12-7-2020','MD10'),
('335','HaNoi','HaiPhong','15:00','17:14','6-9-2020','MD10'),
('336','VungTau','NhaTrang','18:00','20:14','4-3-2020','A330'),
('337','Vinh','VungTau','20:30','23:53','2-6-2020','A330'),
('394','BenTre','BienHoa','19:00','21:30','4-11-2020','A330'),
('395','NhaTrang','DiAn','21:00','23:43','6-12-2020','B747'),
('449','DiAn','HaNoi','10:00','19:29','11-1-2020','B747'),
('930','BienHoa','VungTau','13:00','16:10','11-12-2020','B747'),
('931','DaLat','Hue','17:00','18:10','9-12-2020','B747')
INSERT INTO
Passenger(PassengerID,FirstName,LastName,PhoneNumber,Frequent_flyer_number,Email)
VALUES
('0009','Nga','Nguyen','8932320',null,'nht@gmail.com'),
('0101','Anh','Tran','8826729',1,'lailo@gmail.com'),
('0045','Thu','Le','8932203',2,'immha@gmail.com'),
('0012','Ha','Quang','8933232',1,'mowa@gmail.com'),
('0238','Hung','Ly','9812101',3,'kiukiu@gmail.com'),
('0397','Thanh','Le','8952943',2,'ntil@gmail.com'),
('0582','Mai','Nguyen','03474394',null,'lamina@gmail.com'),
('0934 ','Minh','Le','04563346',null,'sunrka@gmail.com'),
('0091','Hai','Vuong','8893223',2,'geme@gmail.com'),
('0314','Phuong','Vo','8232320',5,'timel@gmail.com'),
('0613','Vu','Cao','8343232',2,'divik@gmail.com'),
('0586','Son','Bach','8556223',4,'didte@gmail.com'),
('0422','Tien','Nguyen','8332222',6,'nhvivi@gmail.com')
```

```
 select * from Passenger
INSERT INTO groups(GroupID,LeaderID,Job,ViceleaderID)
VALUES
('FA1','FA11','Flight Attendant','FA12'),
('FA2','FA22','Flight Attendant','FA23'),
('FA3','FA33','Flight Attendant','FA32'),
('SE1','SE11','Security','SE12'),
('SE2','SE22','Security','SE23'),
('SE3','SE33','Security','SE32'),
('PI1','PI11','Pilot','PI12'),
('PI2','PI22','Pilot','PI23'),
('PI3','PI33','Pilot','PI32')
insert into assignment(GroupID,FlightID)
values
('FA1','122'),
('FA2','337'),
('FA3','330'),
('SE1','122'),
('SE2','337'),
('SE3','330'),
('PI1','122'),
('PI2','337'),
('PI3','330'),

('FA1','337'),
('FA2','330'),
('FA3','122'),
('SE1','337'),
('SE2','330'),
('SE3','122'),
('PI1','337'),
('PI2','330'),
('PI3','122')
insert into Star(starID,star, starMeaning)
```

```
values
(1,1, 'very bad'),
(2,2,'bad'),
(3,3,'Average'),
(4,4, 'good'),
(5,5,'very good')
insert into classes(ClassID,ClassName,Price)
values
('12','Business Class', '1500000'),
('11','Economy Class', '1000000'),
('13','First Class', '2000000'),
('22','Business Class', '2000000'),
('21','Economy Class', '1500000'),
('23','First Class', '2500000'),
('32','Business Class', '2500000'),
('31','Economy Class', '2000000'),
('33','First Class', '3000000')
insert into ticket(TicketID, create_at,ClassID, booking_platform, PassengerID,FlightID)
values
('BHH10009','2020-06-1 03:14:07','32','Agribank','0009','100'),
('AVN33602','2020-05-1 06:17:05','21','Null','0422','336'),
('AVN33604','2020-05-23 05:04:07','23','Tiki','0314','336'),
('AVN33608','2020-05-11 09:00:05','21','Null','0238','336'),
('BHH10005','2020-06-1 03:14:07','33','Agribank','0045','100'),
('AVV33702','2020-05-17 06:10:05','22','Null','0582','337'),
('BHH10004','2020-06-10 03:14:07','33','Shopee','0934','100'),
('AVV33722','2020-05-1 06:19:05','22','Null','0422','336'),
('AVV33711','2020-06-1 03:14:07','23','Null','0101','337'),
('MDCB33013','2020-12-2 09:17:05','11','Lazada','0397','330'),
('MDCB33012','2020-11-30 15:14:07','13','Agribank','0012','330')

insert into review(starID, review, PassengerID, FlightID)
values
(3,'Nhân viên thân thiện nhưng món ăn không ngon', '0009','100'),
```

(4,'An toàn, tiện lợi', '0045','100'),
(5,'null', '0238','336'),
(4,'null','0012','330'),
(3,'null' ,'0397','330'),
(2,'null','0101','337'),
(1,'thái độ nhân viên kém','0582','337'),
(2,'thiết bị máy bay có vẻ không an toàn','0045','100'),
(5,'rất tốt, tuyệt vời','0314','336'),
(3,'bình thường chất lượng ổn với giá','0422','336'),
(5,'rất tốt, sẽ đi lại','0934','100')

insert into BoardingPass(BoardingID, create_at, gate, TicketID)
values
(509, '07:20:00', 5, 'BHH10009'),
(602, ' 17:50',6,'AVN33602'),
(704,'17:55',7,'AVN33604'),
(708,'17:56', 7,'AVN33608'),
(605,'07:30',6,'BHH10005'),
(902,'20:10',9,'AVV33702'),
(204,'07:30',2,'BHH10004'),
(422,'20:00',4,'AVV33722'),
(111,'19:50',1,'AVV33711'),
(713,'15:45',7,'MDCB33013'),
(312,'15:30',3,'MDCB33012')

INSERT INTO Employee(EmployeeID, FirstName, LastName,
Gender,PhoneNumber,Email,yearOfBirth, GroupID)
values
('FA11','Chi','Kiem','Nu','8120012','chikiem@gmail.com',1989,'FA1'),
('FA12','Giao','Thai','Nu','8324467','giaothai@gmail.com',1997,'FA1'),
('FA13','Huong','Phu','Nu','8330733','huongpu@gmail.com',1995,'FA1'),
('SE11','Phong','Ly','Nam','8308117','phongly@gmail.com',1989,'SE1'),
('SE12','Phuong','Quan','Nam','8308155','phuolg@gmail.com',1990,'SE1'),

('SE13','Quang','Dinh','Nam','8324461','quangg@gmail.com',1993,'SE1'),

('PI11','Tam','Nguyen','Nam','84638188','taneeee@gmail.com',1990,'PI1'),

('PI12','Tam','Van','Nam','84581990','tamva@gmail.com',1991,'PI1'),

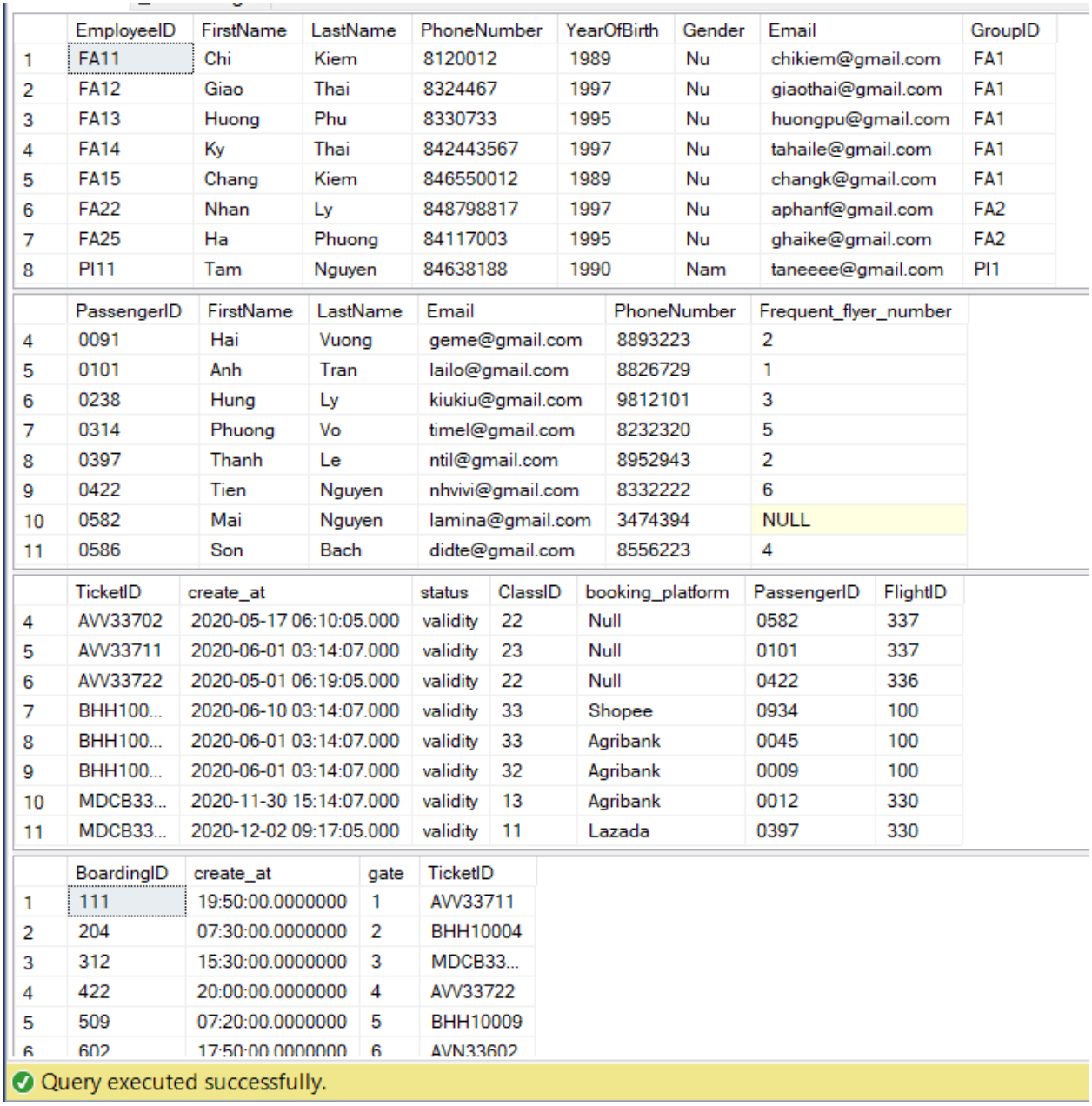
('FA15','Chang','Kiem','Nu','846550012','changk@gmail.com',1989,'FA1'),

('FA14','Ky','Thai','Nu','842443567','tahaile@gmail.com',1997,'FA1'),

('FA25','Ha','Phuong','Nu','84117003','ghaike@gmail.com',1995,'FA2'),

('FA22','Nhan','Ly','Nu','848798817','aphanf@gmail.com',1997,'FA2')

select *from Employee



	EmployeeID	FirstName	LastName	PhoneNumber	YearOfBirth	Gender	Email	GroupID
1	FA11	Chi	Kiem	8120012	1989	Nu	chikiem@gmail.com	FA1
2	FA12	Giao	Thai	8324467	1997	Nu	giaothai@gmail.com	FA1
3	FA13	Huong	Phu	8330733	1995	Nu	huongpu@gmail.com	FA1
4	FA14	Ky	Thai	842443567	1997	Nu	tahaile@gmail.com	FA1
5	FA15	Chang	Kiem	846550012	1989	Nu	changk@gmail.com	FA1
6	FA22	Nhan	Ly	848798817	1997	Nu	aphanf@gmail.com	FA2
7	FA25	Ha	Phuong	84117003	1995	Nu	ghaike@gmail.com	FA2
8	PI11	Tam	Nguyen	84638188	1990	Nam	taneeee@gmail.com	PI1

	PassengerID	FirstName	LastName	Email	PhoneNumber	Frequent_flyer_number
4	0091	Hai	Vuong	geme@gmail.com	8893223	2
5	0101	Anh	Tran	lailo@gmail.com	8826729	1
6	0238	Hung	Ly	kiukiu@gmail.com	9812101	3
7	0314	Phuong	Vo	timel@gmail.com	8232320	5
8	0397	Thanh	Le	ntil@gmail.com	8952943	2
9	0422	Tien	Nguyen	nhvivi@gmail.com	8332222	6
10	0582	Mai	Nguyen	lamina@gmail.com	3474394	NULL
11	0586	Son	Bach	didte@gmail.com	8556223	4

	TicketID	create_at	status	ClassID	booking_platform	PassengerID	FlightID
4	AVV33702	2020-05-17 06:10:05.000	validity	22	Null	0582	337
5	AVV33711	2020-06-01 03:14:07.000	validity	23	Null	0101	337
6	AVV33722	2020-05-01 06:19:05.000	validity	22	Null	0422	336
7	BHH100...	2020-06-10 03:14:07.000	validity	33	Shopee	0934	100
8	BHH100...	2020-06-01 03:14:07.000	validity	33	Agribank	0045	100
9	BHH100...	2020-06-01 03:14:07.000	validity	32	Agribank	0009	100
10	MDCB33...	2020-11-30 15:14:07.000	validity	13	Agribank	0012	330
11	MDCB33...	2020-12-02 09:17:05.000	validity	11	Lazada	0397	330

	BoardingID	create_at	gate	TicketID
1	111	19:50:00.0000000	1	AVV33711
2	204	07:30:00.0000000	2	BHH10004
3	312	15:30:00.0000000	3	MDCB33...
4	422	20:00:00.0000000	4	AVV33722
5	509	07:20:00.0000000	5	BHH10009
6	602	17:50:00.0000000	6	AVN33602

Query executed successfully.

	reviewID	starID	review	PassengerID	FlightID
1	1	3	Nhân viên thân thi?n nhung món an không ngon	0009	100
2	2	4	An toàn, ti?n l?i	0045	100
3	3	5	null	0238	336
4	4	4	null	0012	330
5	5	3	null	0397	330
6	6	2	null	0101	337
7	7	1	thái d? nhân viên kém	0582	337
8	8	2	thi?t b? máy bay có v? không an toàn	0045	100

	ClassID	ClassName	Price
1	11	Economy Class	1000000
2	12	Business Class	1500000
3	13	First Class	2000000
4	21	Economy Class	1500000
5	22	Business Class	2000000
6	23	First Class	2500000
7	31	Economy Class	2000000
8	32	Business Class	2500000

	TicketID	create_at	status	ClassID	booking_platform	PassengerID	FlightID
1	AVN33602	2020-05-01 06:17:05.000	validity	21	Null	0422	336
2	AVN33604	2020-05-23 05:04:07.000	validity	23	Tiki	0314	336
3	AVN33608	2020-05-11 09:00:05.000	validity	21	Null	0238	336
4	AVV33702	2020-05-17 06:10:05.000	validity	22	Null	0582	337
5	AVV33711	2020-06-01 03:14:07.000	validity	23	Null	0101	337
6	AVV33722	2020-05-01 06:19:05.000	validity	22	Null	0422	336
7	BHH100...	2020-06-10 03:14:07.000	validity	33	Shopee	0934	100
8	BHH100...	2020-06-01 03:14:07.000	validity	33	Agribank	0045	100

	starID	star	starMeaning
1	1	1	very bad
2	2	2	bad
3	3	3	Average
4	4	4	good
5	5	5	very good

Query executed successfully.

	GroupID	FlightID
5	SE2	337
6	SE3	330
7	PI1	122
8	PI2	337
9	PI3	330
10	FA1	337
11	FA2	330
12	FA3	122

	GroupID	LeaderID	Job	ViceleaderID
1	FA1	FA11	Flight Attendant	FA12
2	FA2	FA22	Flight Attendant	FA23
3	FA3	FA33	Flight Attendant	FA32
4	PI1	PI11	Pilot	PI12
5	PI2	PI22	Pilot	PI23
6	PI3	PI33	Pilot	PI32
7	SE1	SE11	Security	SE12
8	SE2	SE22	Security	SE23

Query executed successfully.

CHAPTER 5: QUERY

1–. display employeeID, Full name of Pilot who drove Boeing and count the number of times He drove it.

```
select em.EmployeeID , em.FirstName +' '+ em.LastName as 'full name', count(*) as 'times used boeing'
from Airplane ai join Flight fl on fl.airplaneID = ai.airplaneID join assignment ass on ass.FlightID= fl.FlightID join Groups gr on gr.GroupID=gr.GroupID join Employee em on gr.GroupID= em.GroupID
where ai.Name = 'Boeing' and gr.Job ='Pilot'
group by EmployeeID, FirstName, LastName
```

Results Messages

	EmployeeID	full name	times used boeing
1	PI11	Tam Nguyen	6
2	PI12	Tam Van	6

Query executed successfully.

2-- sắp xếp theo thứ tự giảm dần những máy bay được sử dụng

```
select ai.airplaneID, ai.Name, (select count(fl.airplaneID) from Flight fl where ai.airplaneID
= fl.airplaneID ) as 'times of used'
from Airplane ai
order by [times of used] desc
```

Results Messages

	airplaneID	Name	times of used
1	B727	Boeing	4
2	B747	Boeing	4
3	MD10	MD	4
4	A330	Airbus	3
5	A340	Airbus	0
6	A310	Airbus	0
7	A320	Airbus	0
8	B757	Boeing	0
9	B767	Boeing	0
10	MD92	MD	0

Query executed successfully.

3-- Display Flight ID, Arrival Time, DepartureDate and Sum of available Seat in that Flight

```
select fl.FlightID,fl.ArrivalTime, fl.DepartureDate, ai.BS+ai.ES+ai.FS - count(ticketID) as
'sum of available Seat'
from Flight fl join ticket t on fl.FlightID = t.FlightID left join Airplane ai on ai.airplaneID =
fl.airplaneID
group by fl.FlightID, fl.ArrivalTime, fl.DepartureDate, bs, es,fs
```

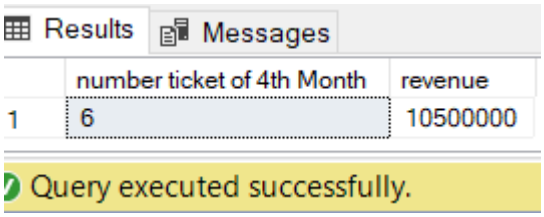
Results Messages

	FlightID	ArrivalTime	DepartureDate	sum of available Seat
1	100	17:50:00.0000000	2020-11-06	182
2	330	18:53:00.0000000	2020-04-08	178
3	336	20:14:00.0000000	2020-04-03	103
4	337	23:53:00.0000000	2020-02-06	105

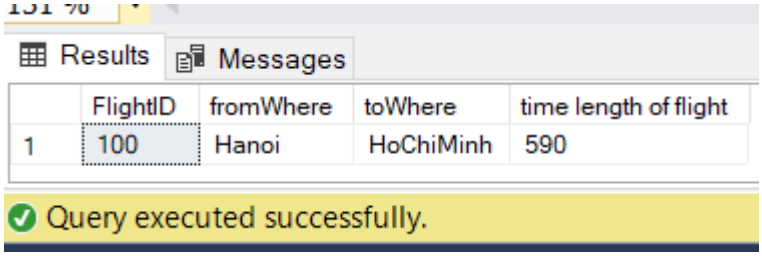
Query executed successfully.

4-- Display number Tickets was sold , and revenue of the company at April

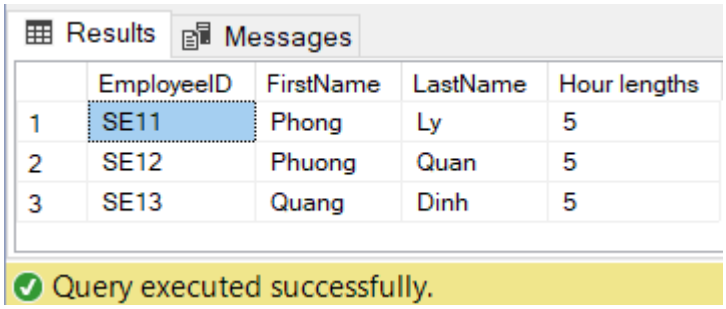
```
select count(ti.ticketID) as 'number ticket of 4th Month', sum(cl.Price) as 'revenue'
from ticket ti join Classes cl on ti.ClassID=cl.ClassID join Flight fl on fl.FlightID =
ti.FlightID
Where MONTH(fl.departureDate) = 4
```




```
5-- Display Flight ID, place departure, and time length of Flight that have the most time
flying

select FlightID, fromWhere, toWhere, datediff(minute, DepartureTime, ArrivalTime) as 'time
length of flight'
from Flight
where datediff(minute, DepartureTime, ArrivalTime) >= all(
        select datediff(minute, DepartureTime, ArrivalTime)
        from Flight
)
```




```
6-- Display number of hours work in a year of Security and show EmployeeID, FirstName,
LastName of the Security
select EmployeeID, e.FirstName, e.LastName, sum(datediff(HOUR, DepartureTime,
ArrivalTime) ) as 'Hour lengths'
from Flight fl join assignment ass on fl.FlightID = ass.FlightID join Groups gr on gr.GroupID
= ass.GroupID join Employee e on gr.GroupID=e.GroupID
Where gr.Job = 'Security'
group by EmployeeID, e.FirstName, e.LastName
```



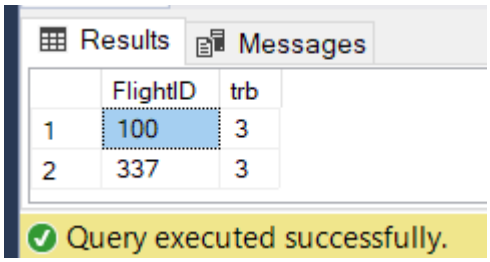
Results | Messages

	EmployeeID	FirstName	LastName	Hour lengths
1	SE11	Phong	Ly	5
2	SE12	Phuong	Quan	5
3	SE13	Quang	Dinh	5

Query executed successfully.

7– Display Flight ID, and Average number of stars of flights that have 1 or 2 stars

```
select distinct FlightID, trb
from Review re , (select avg(star) as trb from Star) stw
 where re.starID in (select st.starID from Star st where st.star =1 or st.star =2 )
```



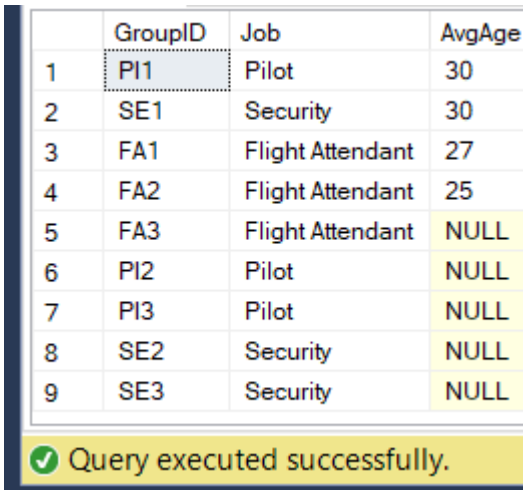
Results | Messages

	FlightID	trb
1	100	3
2	337	3

Query executed successfully.

8-- Display groupID, Job Name and Employee Average Age of each group.

```
select gr.GroupID, gr.Job, (select AVG(DATEPART(year, CURRENT_TIMESTAMP) -
em.yearOfBirth) from Employee em where em.GroupID = gr.GroupID ) AvgAge
 from Groups gr
 order by AvgAge desc
```



	GroupID	Job	AvgAge
1	PI1	Pilot	30
2	SE1	Security	30
3	FA1	Flight Attendant	27
4	FA2	Flight Attendant	25
5	FA3	Flight Attendant	NULL
6	PI2	Pilot	NULL
7	PI3	Pilot	NULL
8	SE2	Security	NULL
9	SE3	Security	NULL

Query executed successfully.

9-- Display booking platfrom which Passenger booked Ticket on, and show passengerID, FirstName, frequent_flyer_number.

```
select ti.booking_platform, pa.PassengerID, pa.FirstName, pa.Frequent_flyer_number
from ticket ti left join Passenger pa on ti.PassengerID = pa.PassengerID where
ti.booking_platform != 'NULL'
order by Frequent_flyer_number
```

Results | Messages

	booking_platform	PassengerID	FirstName	Frequent_flyer_number
1	Shopee	0934	Minh	NULL
2	Agribank	0009	Nga	NULL
3	Agribank	0012	Ha	1
4	Lazada	0397	Thanh	2
5	Agribank	0045	Thu	2
6	Tiki	0314	Phuong	5

```
10-- Display place that have smallest number that flight landing , and show these place
select  toWhere, count(flightID) as 'Numbers of landing'
from Flight
group by toWhere
having count(FlightID) <= all(
        select count(FlightID)
        from Flight
        group by toWhere
)
```

131 %

Results | Messages

	toWhere	Numbers of landing
1	DiAn	1
2	HaiPhong	1
3	HaNoi	1
4	HoChiMinh	1
5	QuyNhon	1