



Jaypee University of Information Technology
Department of Computer Science and
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An Airline database project

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LAB

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INTRODUCTION

This is the Airline system which consists of several branches in different countries. This airline is operating on spot Airline Reservation, flight booking services.

1. Sales Transaction :

All sales transactions are related to flight ticket sales, advance reservations, reservation cancellations.

- a. Reservation - This Airline provides flight pre-reservation to its customers.
- b. Cancellation. A customer can always cancel their flights but if the cancellation request is made within 6 hours of flight then the Airline denies cancelling a sold flight ticket.

2. Ticketing :

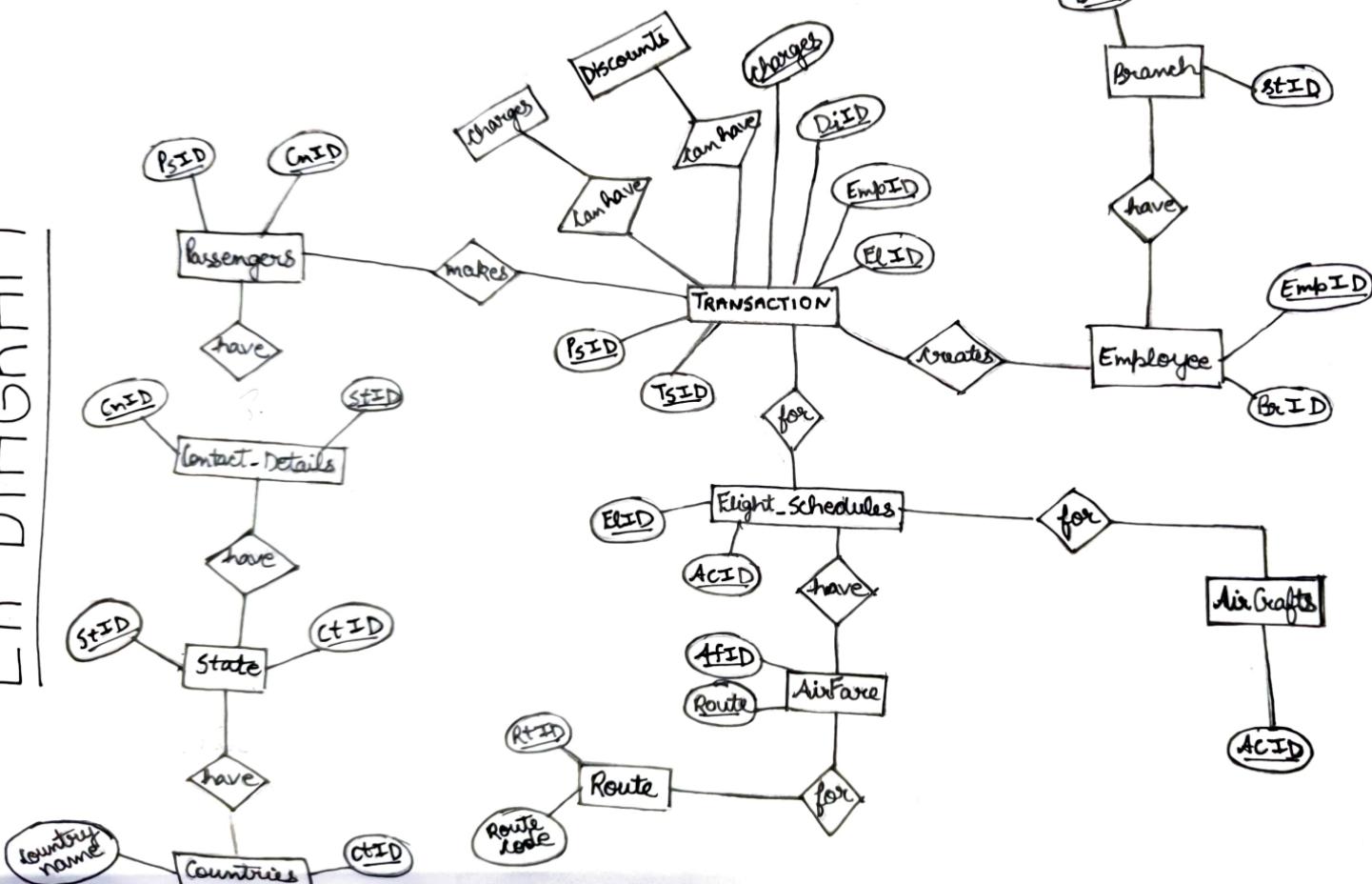
On spot ticket sales, online reservation can be made Highly dedicated in customer services, Airline offers several discount schemes for children and women.

This is the computerised Airlines Reservation system that will help manage all the information related to flights, passengers and their contact details, reservation, transaction, air fare payment etc.

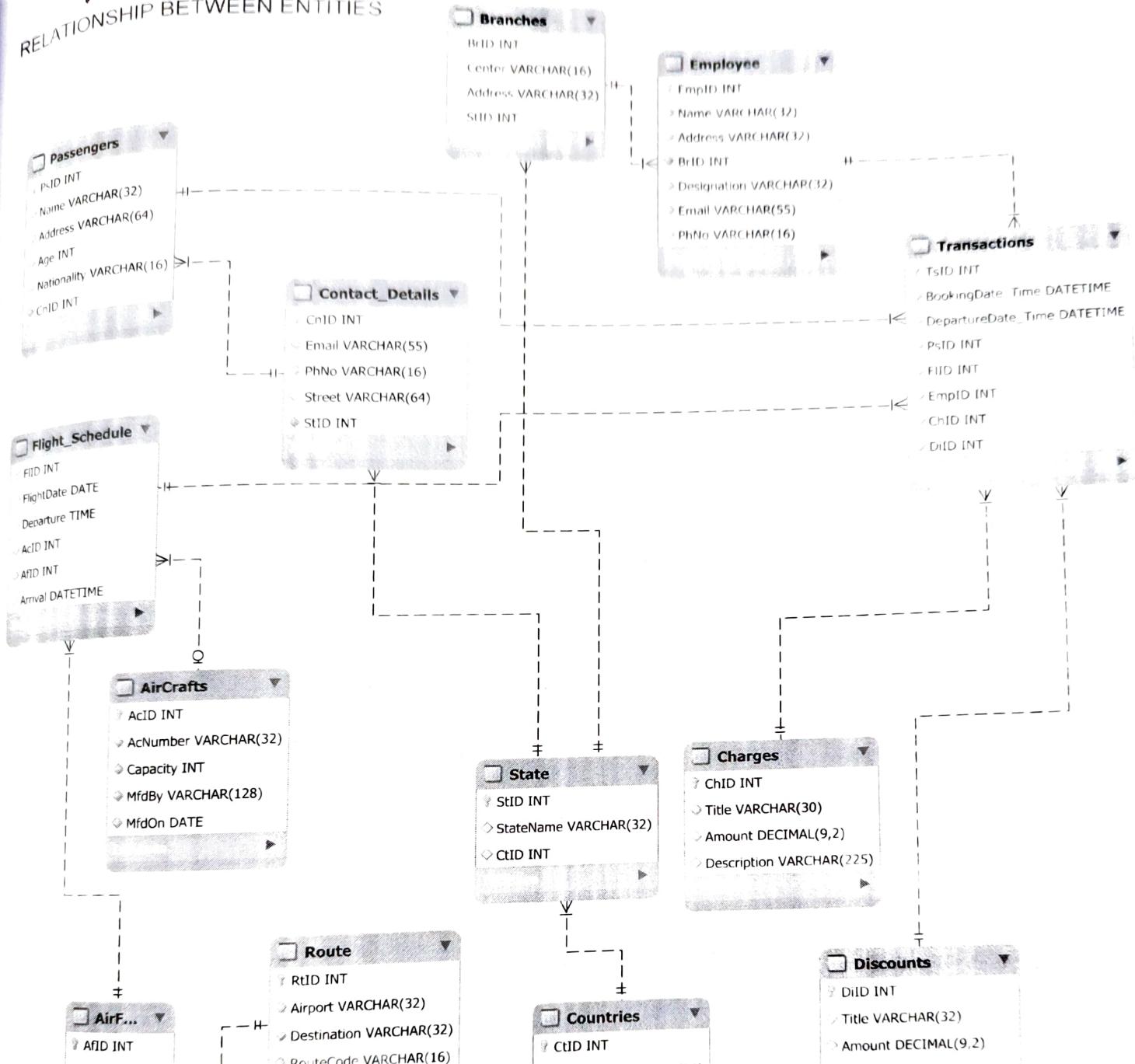
DATA TYPES USED

1. **CHAR(size)** - A FIXED length string (can contain letters, numbers, and special characters). The *size* parameter specifies the column length in characters - can be from 0 to 255. Default is 1
2. **VARCHAR(size)** - A VARIABLE length string (can contain letters, numbers, and special characters). The *size* parameter specifies the maximum column length in characters - can be from 0 to 65535
3. **INT** - A medium integer. Signed range is from -2147483648 to 2147483647. Unsigned range is from 0 to 4294967295. The *size* parameter specifies the maximum display width (which is 255)
4. **DATE** - A date. Format: YYYY-MM-DD. The supported range is from '1000-01-01' to '9999-12-31'
5. **DATETIME** - A date and time combination. Format: YYYY-MM-DD hh:mm:ss. The supported range is from '1000-01-01 00:00:00' to '9999-12-31 23:59:59'. Adding DEFAULT and ON UPDATE in the column definition to get automatic initialization and updating to the current date and time
6. **TIMESTAMP** - TIMESTAMP values are stored as the number of seconds since the Unix epoch ('1970-01-01 00:00:00' UTC). Format: YYYY-MM-DD hh:mm:ss. Automatic initialization and updating to the current date and time can be specified using DEFAULT CURRENT_TIMESTAMP and ON UPDATE CURRENT_TIMESTAMP in the column definition
7. **DECIMAL** - An exact fixed-point number. The total number of digits is specified in *size*. The number of digits after the decimal point is specified in the *d* parameter. The maximum number for *size* is 65.

ER-DIAGRAM



RELATIONSHIP BETWEEN ENTITIES



mysql> desc Branches;					
Field	Type	Null	Key	Default	Extra
BRID	int	NO	PRI	NULL	
Center	varchar(16)	NO		NULL	
Address	varchar(32)	NO		NULL	
STD	int	YES	MUL	NULL	

rows in set (0.00 sec)

mysql> desc Employee;					
Field	Type	Null	Key	Default	Extra
EmpID	int	NO	PRI	NULL	
Name	varchar(32)	NO		NULL	
Address	varchar(32)	NO		NULL	
BRID	int	NO	MUL	NULL	
Designation	varchar(32)	NO		NULL	
Email	varchar(55)	NO		NULL	
PhNo	varchar(16)	NO		NULL	

7 rows in set (0.00 sec)

mysql> desc Transactions;

Field	Type	Null	Key	Default	Extra
TsID	int	NO	PRI	NULL	
BookingDate_Time	datetime	NO		now()	
departureDate_Time	datetime	YES		NULL	
PSID	int	YES	MUL	NULL	
FID	int	YES	MUL	NULL	
EMPID	int	YES	MUL	NULL	
CHID	int	YES	MUL	NULL	
DIID	int	YES	MUL	NULL	

8 rows in set (0.00 sec)

TABLES AFTER INSERTING VALUES:

mysql> select * from AirCrafts;

ACID	ACNumber	Capacity	MfdBy	Mfdon
101	AG-101	3000	AIRBUS	2003-04-10
102	AG-102	2000	ROLLS ROYEE	2003-05-25
103	AG-103	4000	HAVEUS	2006-08-28
104	AG-104	6000	BOEING	2002-07-30
105	AG-105	4500	BEECHCRAFT	2015-06-18

5 rows in set (0.00 sec)

mysql> select * from Route;

RtID	Airport	Destination	RouteCode
701	DELHI	BENGALURU	DEL-BEN
708	CHICAGO	ROME	CHI-ROM
712	ATLANTA	FRANKFURT	ATL-FRA
718	NEW YORK	LONDON	NEW-LON
750	SYDNEY	MELBOURNE	SYD-MEL

5 rows in set (0.00 sec)

```
mysql> select * from AirFare;
```

AfID	RtID	Fare	FSC
16412	712	320	880
70171	708	230	760
75632	718	440	920
82195	701	150	700
85806	750	600	1200

5 rows in set (0.00 sec)

```
mysql> select * from Flight_schedule;
```

FID	FlightDate	Departure	Arrival	AcID	AfID
52576	2022-12-20	09:00:00	15:00:00	102	70171
55838	2022-12-20	11:15:00	18:00:00	101	82195
56097	2022-12-22	13:00:00	20:00:00	103	16412
58762	2022-12-24	06:00:00	16:00:00	104	75632
69758	2022-12-25	12:00:00	23:00:00	105	85806

5 rows in set (0.00 sec)

```
mysql> select * from Discounts;
```

DID	Title	Amount	Description
1	offer	2.00	Rupees 2 Special offer discount to all.
340	children	5.00	Rupees 5 Discount is provide to all children under age of 10.
365	womens	3.00	Rupees 3 Discount is provide to all the womens

3 rows in set (0.00 sec)

```
mysql> select * from charges;
```

ChID	Title	Amount	Description
344	urgent cancellation	10.00	Rupees 10 will be charged for cancellation for booking within 11 hrs from flight time

1 row in set (0.00 sec)

```
mysql> select * from Countries;
```

CtID	CountryName
211340	INDIA
211400	AUSTRALIA
211439	UNITED STATES

3 rows in set (0.00 sec)

```
mysql> select * from state;
```

STID	StateName	CtID
111	DELHI	211340
222	ALASKA	211439
255	UP	211340
333	VICTORIA	211400

4 rows in set (0.00 sec)

```
mysql> select * from Contact_Details;
```

CnID	Email	PhNo	Street	StID
1947	hello@gmail.com	8219516419	RAJOURI GARDEN	111
1950	welcome@gmail.com	8580641909	SESAME STREET	222
1975	namaste@gmail.com	7017175639	VICTORIA STREET	333

3 rows in set (0.00 sec)

```
mysql> select * from Passengers;
```

PsID	Name	Address	Age	Nationality	CnID
20001	SHIVAM THAKUR	SUNDERNAGAR-21	19	INDIAN	1947
20002	SHAURYA KASHYAP	NORTH KIERLAND	27	AMERICAN	1950
20003	AKSHARA THAKUR	NEW WHYALLA	22	AUSTRALIAN	1975

3 rows in set (0.00 sec)

```
mysql> select * from Branches;
```

BrID	Center	Address	StID
130431	AIRBUS CANADA	NEW ATLANTIS	333
133104	ROYAL AIR FORCE	NEW ROAD KATHMANDU	111
136201	AVIATION TRENDS	KINGSTON NEW YORK	222

3 rows in set (0.00 sec)

```
mysql> select * from Employee;
```

EmpID	Name	Address	BrID	Designation	Email	PhNo
251122	AAYUSH	MP INDIA	133104	PILOT	roman@gmail.com	9816079682
262233	KARAN	LOS ANGELES	136201	PILOT	seth@gmail.com	9816881523
273344	DHRUV	CASTLEREAGH STREET	130431	SECURITY	brock@gmail.com	8217916034

3 rows in set (0.00 sec)

```
mysql> select * from Transactions;
```

TsID	BookingDate_Time	DepartureDate_Time	PsID	FID	EmpID	ChID	DiID
54322	2022-12-04 11:27:11	2022-12-20 11:15:00	20001	55838	251122	NULL	NULL
54328	2022-12-04 11:27:19	2022-12-20 09:00:00	20002	52576	262233	344	NULL
54330	2022-12-04 11:27:31	2022-12-22 13:00:00	20003	56097	273344	NULL	365

3 rows in set (0.00 sec)

FUNCTIONAL DEPENDENCIES

AIRCRAFTS

(AcId, AcNumber, Capacity, mfdBy, mfdOn)

R(A B C D E)

AB → C D E

ROUTE

(RtId, Airport, destination, RouteCode)

R(A B C D)

AD → BC

AIRFARE

(AfId, RtId, Fare, FSC)

R(A B C D)

AB → C D

DISCOUNTS

(diId, title, amount, description)

R(A B C D)

A → B C D

COUNTRIES

(ctId, countryName)

R(A B)

A → B

~~C~~

I CONTACT_DETAILS

(CnId, Email, PhNo, Street, StId)

R(A B C D E)

A → BCDE

I FLIGHT_SCHEDULE

(FlId, FlightDate, Departure, Arrival, AcId,
AbId)

R(A B C D E F)

A → BCDEF

I CHARGES

(ChId, Title, Amount, Description)

R(A B C D)

A → BCD

STATE

(StId, StateName, CtId)

R(A B C)

AB → C

PASSENGERS

(PsId, Name, Address, Age, Nationality, CnId)

R(A B C D E F)

AF → BCDE

BCNF - BOYCE CODD NORMAL FORM

A relation is in BCNF if in every non-trivial functional dependency

$$x \rightarrow y$$

x is a superkey

AIRCRAFTS

(AcId, AcNumber, capacity, mbBy, mfdon)

(ABCDE)
 $B \rightarrow CDE$

(AB+ is a candidate key)

ROUTE

(RtId, Airport, destination, RouteCode)

(ABCD)
 $D \rightarrow BC$

(AD+ is a superkey)

AIRFARE

(AbId, RtId, Fare, FSC)

(ABCD)
 $B \rightarrow CD$

(AB+ is a superkey)

DISCOUNTS

(DiId, Title, amount, description)

(ABCD)
 $\rightarrow BCD$

(A+ is a superkey)

COUNTRIES

(CtId, CountryName)

(A B)

(A+ is a superkey)

CONTACT- DETAILS

(CnId, Email, phNo, street, stId)

(ABCDE)
 $\rightarrow C$

(A+ is a superkey)

FLIGHT-SCHEDULE

R(FId, FlightDate, Departure, Arrival, ScId,
 JobId)
 (ABCDEF)
 $A \rightarrow BCDEF$ (A+ is a Superkey)

CHARGES

(ChId, Title, Amount, Description)
 (ABCD)
 $A \rightarrow BCD$ (A+ is a Superkey)

STATE

StId, StateName, CtId)
 ABC)
 $B \rightarrow C$ (AB+ is a Superkey)

PASSENGERS

PsId, Name, Address, Age, Nationality, CnId)
 (ABCDEF)
 $F \rightarrow BCDE$ (AF+ is a Superkey)

BRANCHES

BnId, Center, Address, CtId)
 (ABCD)
 $D \rightarrow BC$ (AD+ is a Superkey)

EMPLOYEE

EmpId, Name, Address, BnId, designation,
 Email, PhNo)
 (ABCDEFG)
 $G \rightarrow ABCDE$ (FG+ is a Superkey)

XIII TRANSACTIONS

R (T8 Id, Booking Date-Time, Departure Date-Time,
P8 Id, Fil Id, Emp Id, ch Id, di Id)
R (A B C D E F G H)
 $AD \rightarrow BCEFGH$ (AD+ is a superkey)

REMARKS : all the tables satisfy
BCNF normal form. H.p

QUERIES

QUERIES:

- Find aircraft number, pickup and destination place and route code for which flight is scheduled after 2022-12-22.

```
select AcNumber, Airport, Destination, RouteCode
from Aircrafts a, Route r, Airfare aa, Flight_Schedule f
where(FlightDate > "2022-12-22") and
a.AcID=f.AcID and r.RtID=aa.RtID and aa.AfID=f.AfID;
```

AcNumber	Airport	Destination	RouteCode
AG-104	NEW YORK	LONDON	NEW-LON
AG-105	SYDNEY	MELBOURNE	SYD-MEL

2 rows in set (0.06 sec)

- Find the name, age, email, Phno of PASSENGERS those who are from INDIA or AUSTRALIA.

```
select Name, Age, Email, PhNo
from Passengers p, Contact_Details c, State s, Countries o
where(o.CountryName="INDIA" or
o.CountryName="AUSTRALIA") and
c.StID=s.StID and p.CnID=c.CnID and s.CtID=o.CtID;
c.StID=s.StID and p.CnID=c.CnID and s.CtID=o.CtID;
```

Name	Age	Email	PhNo
SHIVAM THAKUR	19	hello@gmail.com	8219516419
AKSHARA THAKUR	22	namaste@gmail.com	7017175639

2 rows in set (0.00 sec)

3. Find the name, Phno, email and designation of employees whose Center is ROYAL AIR FORCE.

select Name, PhNo, Email, Designation
from Employee e Branches b
where e BrID=b BrID AND
(b Center="ROYAL AIR FORCE");

Name	PhNo	Email	Designation
AYUSH	9816079682	roman@gmail.com	PILOT

1 row in set (0.00 sec)

4. Use cross join on tables - AirCrafts and Flight_Schedule

select AirCrafts.AcID, AirCrafts.AcNumber, AirCrafts.Capacity,
Flight_schedule.FlightDate, Flight_Schedule.Departure,
Flight_Schedule.Arrival from AirCrafts
cross join Flight_Schedule
where AirCrafts.AcID=Flight_Schedule.AcID;

AcID	AcNumber	Capacity	FlightDate	Departure	Arrival
101	AG-101	3000	2022-12-20	11:15:00	18:00:00
102	AG-102	2000	2022-12-20	09:00:00	15:00:00
103	AG-103	4000	2022-12-22	13:00:00	20:00:00
104	AG-104	6000	2022-12-24	06:00:00	16:00:00
105	AG-105	4500	2022-12-25	12:00:00	23:00:00

5 rows in set (0.00 sec)

5. Find the Aircraft numbers and Capacity as NO_OF_PASSENGERS to travel having more than 3000 seats.

select AcNumber, Capacity as NO_OF_PASSENGERS
FROM AirCrafts
group by AcID
having Capacity > 3000;

AcNumber	NO_OF_PASSENGERS
AG-103	4000
AG-104	6000
AG-105	4500

3 rows in set (0.00 sec)