

King Abdul-Aziz International Airport



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Introduction

Phase1:

problem description :

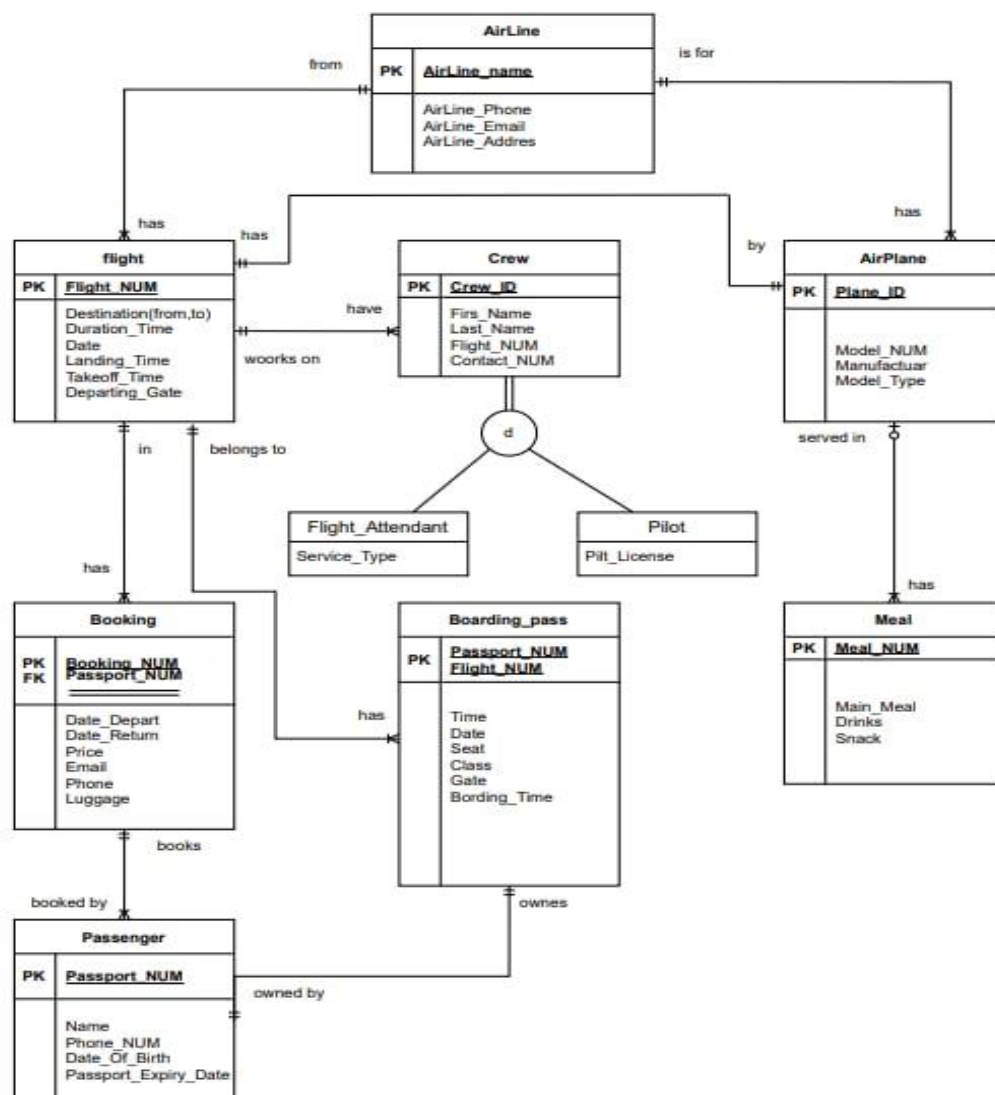
King Abdelaziz airport needs a new database system to organize online booking and make it easier for the passengers to book their flights this database will help the passenger to be able to find information about their flights and keep them updated and help the staff analyse the flights and the passengers and make it easier to deal with the knowledge of the passengers and the flights.

Entities:

- 1- Airline
- 2- Airplane
- 3- Flight
- 4- Booking
- 5- Meal
- 6- Boarding_pass
- 7- Passenger
- 8 -Crew

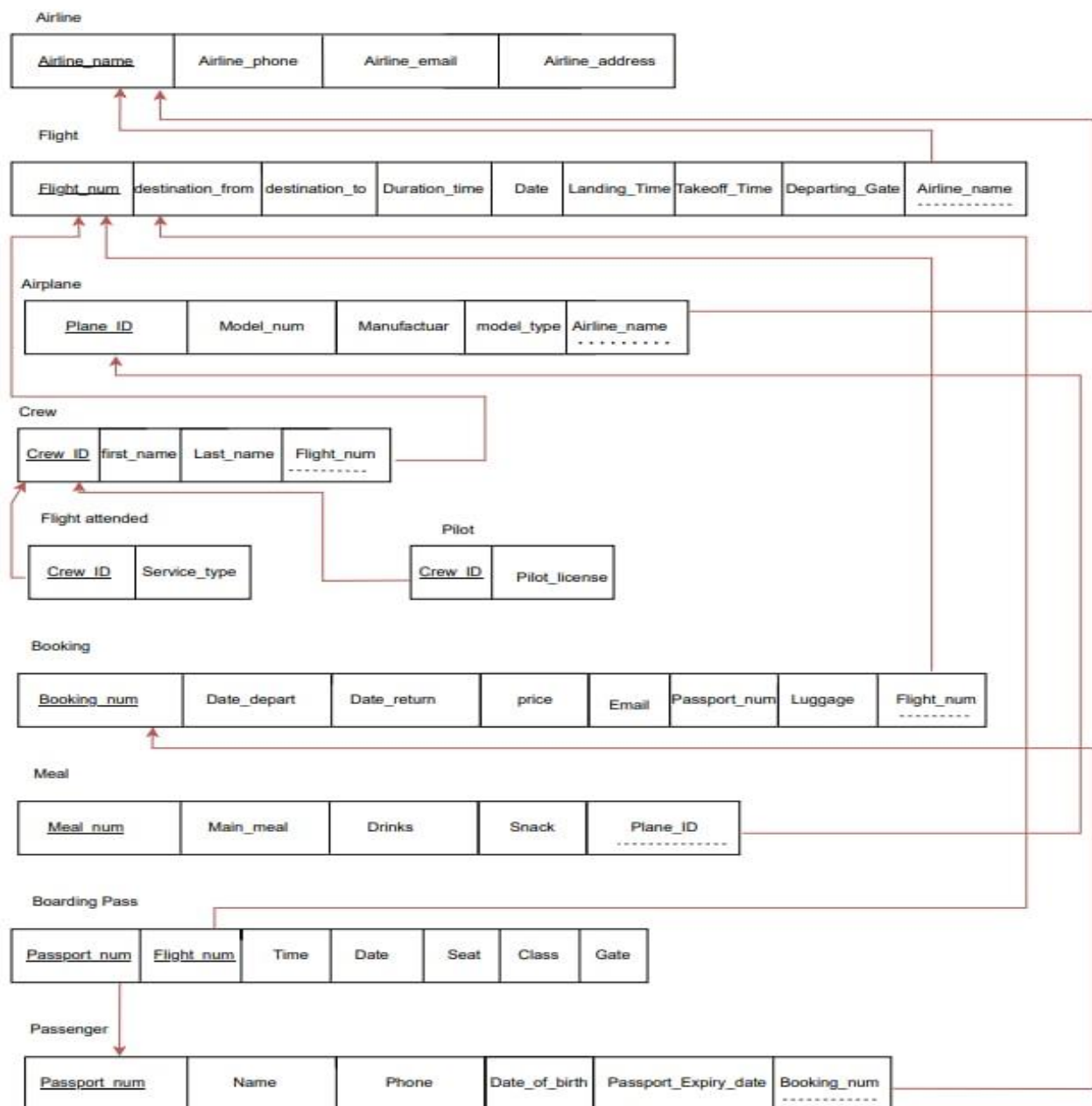


Phase2:





Phase 3:





Normalization:

The condition for 1NF:

- 1-All relation must have unique primary key.
- 2-Remove repeating group or remove multi value attribute.
- 3-remove composite attribute

The flight entity has a composite attribute Destination (to, from)

When we turned the er diagram to relation the composite attribute was broken into two separate entities.

The condition for 2NF:

- 1-Remove partial functional dependencies.
already in 2NF.

The condition for 3NF:

- 1-Remove transitive dependencies.
already in 3NF; No transitive dependency



Phase4:

code:

1- Airline Table

Live SQL

SQL Worksheet

```

1 CREATE TABLE Airline
2 (
3   AirLine_name varchar2(30) primary key,
4   Airline_phone number(20),
5   Airline_Email varchar2(40),
6   Airline_Addres varchar2(30)
7 );
8
9 describe Airline;
10 insert into Airline values('Etihad','0097160055666','etihad@hotmail.com','Abu Dhabi');
11 insert into Airline values('Emirates','18007773999','emirates@hotmail.com','Emirates');
12 insert into Airline values('Egypt air','920022222','egyptair@hotmail.com','Egypt');
13 insert into Airline values('SAUDIA','920022222','alfursan@hotmail.com','Saudia');
14 insert into Airline values('flynas','090070000','egypt@hotmail.com','Saudia');
15 SELECT*from Airline;

```

AIRLINE_NAME	AIRLINE_PHONE	AIRLINE_EMAIL	AIRLINE_ADDRES
Etihad	97160055666	etihad@hotmail.com	Abu Dhabi
Emirates	18007773999	emirates@hotmail.com	Emirates
Egypt air	920022222	egyptair@hotmail.com	Egypt
SAUDIA	920022222	alfursan@hotmail.com	Saudia
flynas	90070000	egypt@hotmail.com	Saudia

Download CSV
5 rows selected.

2- Airplane Table

Live SQL

SQL Worksheet

```

16 CREATE TABLE Airplane
17 (
18   Plane_ID number(20) primary key,
19   Model_num varchar2(30),
20   Manufactuar varchar2(30),
21   model_type varchar2(30),
22   Airline_name varchar2(30),
23   constraint Airline_name foreign key( AirLine_name) references Airline( AirLine_name)
24 );
25
26 DESCRIBE Airplane;
27 insert into Airplane values(501,'Boeing-487','canada','Air Bus','Etihad');
28 insert into Airplane values(300,'Boeing-487','Italy','mid-size-jets','Emirates');
29 insert into Airplane values(2001,'Airbus-A330','Japan','Jumbo jets','Egypt air');
30 insert into Airplane values(1111,'Boeing-757','Brazil','jets','SAUDIA');
31 insert into Airplane values(901,'Boeing-747','canada','jets','flynas');
32 SELECT*from Airplane;

```

PLANE_ID	MODEL_NUM	MANUFACTUAR	MODEL_TYPE	AIRLINE_NAME
501	Boeing-487	canada	Air Bus	Etihad
300	Boeing-487	Italy	mid-size-jets	Emirates
2001	Airbus-A330	Japan	Jumbo jets	Egypt air
1111	Boeing-757	Brazil	jets	SAUDIA
901	Boeing-747	canada	jets	flynas

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3- Flight Table

Live SQL

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SQL Worksheet Clear Find Actions Save Run

```

33 CREATE TABLE Flight(
34     Flight_NUM varchar2(30),
35     destination_from VARCHAR2(30),
36     destination_to VARCHAR2(30),
37     duration_time VARCHAR2(30),
38     takeoff_time VARCHAR2(30),
39     landing_time VARCHAR2(30),
40     flight_date DATE,
41     departing_gate VARCHAR2(30),
42     Airline_name varchar2(30),
43     CONSTRAINT FLIGHT_PK PRIMARY KEY (Flight_NUM),
44     CONSTRAINT FLIGHT_FK FOREIGN KEY (AirLine_name) references AirLine( AirLine_name)
45 );
46 DESCRIBE Flight;
47
48 insert into Flight values('CV335','Jeddah','cairo','2:20','5:00','6:20','25-NOV-2022','E71','Etihad');
49 insert into Flight values('EK1','Jeddah','Dubai','2:50','15:40','19:30','26-NOV-2022','G21','Emirates');
50 insert into Flight values('SV1056','Jeddah','Riyadh','1:45','1:30','3:15','27-NOV-2022','F21','Egypt air');
51 insert into Flight values('SV500','Jeddah','Kuwait','2:00','14:00','16:00','30-NOV-2022','H5','SAUDIA');
52 insert into Flight values('SV1642','Jeddah','Abha','1:20','5:55','7:10','10-DEC-2022','F10','flynas');
53 SELECT *from Flight;

```

FLIGHT_NUM	DESTINATION_FROM	DESTINATION_TO	DURATION_TIME	TAKEOFF_TIME	LANDING_TIME	FLIGHT_DATE	DEPARTING_GATE	AIRLINE_NAME
CV335	Jeddah	cairo	2:20	5:00	6:20	25-NOV-22	E71	Etihad
EK1	Jeddah	Dubai	2:50	15:40	19:30	26-NOV-22	G21	Emirates
SV1056	Jeddah	Riyadh	1:45	1:30	3:15	27-NOV-22	F21	Egypt air

4- Crew Table

Live SQL

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```

55 CREATE TABLE Crew (
56     Crew_ID Varchar2(30),
57     first_name VARCHAR2(30),
58     last_name VARCHAR2(30),
59     Flight_NUM varchar2(30),
60     CONSTRAINT CREW_PK PRIMARY KEY (Crew_ID),
61     CONSTRAINT CREW_FK FOREIGN KEY (Flight_NUM) REFERENCES Flight (Flight_NUM)
62 );
63 DESCRIBE Crew;
64 -- FLIGHT ATTENDET INFO
65 insert into Crew values ('ANH178H', 'CLARK', 'KING', 'CV335' );
66 insert into Crew values ('JKW443M', 'MILLER', 'FORD', 'SV1056' );
67 insert into Crew values ('LME284F', 'ALELEN', 'TURNER', 'SV500' );
68 insert into Crew values ('OZQ035Z', 'SMITH', 'BLAKE', 'EK1' );
69 insert into Crew values ('LAW630B', 'JONES', 'TURNER', 'SV1642' );
70 -- PILOT INFO
71 insert into Crew values ('QHE165G', 'ADAM', 'TURNER', 'CV335' );
72 insert into Crew values ('FVH548V', 'JAMES', 'FORD', 'SV1056' );
73 insert into Crew values ('KIS043F', 'SCOTT', 'BLAKE', 'SV500' );
74 insert into Crew values ('DZH364G', 'BLAKE', 'FORD', 'EK1' );
75 insert into Crew values ('LAG829A', 'JONES', 'KING', 'SV1642' );
76 SELECT *FROM Crew;

```

CREW_ID	FIRST_NAME	LAST_NAME	FLIGHT_NUM
ANH178H	CLARK	KING	CV335
JKW443M	MILLER	FORD	SV1056
LME284F	ALELEN	TURNER	SV500



5-Flight Attended Table

Join:

```
SELECT Crew_ID,first_name,last_name,Flight_NUM,service_type
FROM Crew NATURAL JOIN FlightAttended ;
```

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SQL Worksheet

Clear Find Actions Save Run

```

78 CREATE TABLE FlightAttended
79 (
80   Crew_ID Varchar2(30),
81   service_type VARCHAR2(30),
82   CONSTRAINT Fattended_FK FOREIGN KEY (Crew_ID) REFERENCES Crew (Crew_ID)
83 );
84 DESCRIBE FlightAttended;
85 insert into FlightAttended Values ('ANH178H','Full Time Placement');
86 insert into FlightAttended Values ('JKW443M','Temporary Staff');
87 insert into FlightAttended Values ('LME284F','Temporary Staff');
88 insert into FlightAttended Values ('OZQ035Z','Full Time Placement');
89 insert into FlightAttended Values ('LAW630B','Full Time Placement');
90 -- JOIN
91 SELECT Crew_ID,first_name,last_name,Flight_NUM,service_type
92 FROM Crew NATURAL JOIN FlightAttended ;

```

CREW_ID	FIRST_NAME	LAST_NAME	FLIGHT_NUM	SERVICE_TYPE
ANH178H	CLARK	KING	CV335	Full Time Placement
JKW443M	MILLER	FORD	SV1056	Temporary Staff
LME284F	ALELEN	TURNER	SV500	Temporary Staff
OZQ035Z	SMITH	BLAKE	EK1	Full Time Placement
LAW630B	JONES	TURNER	SV1642	Full Time Placement
ANH178H	CLARK	KING	CV335	Full Time Placement
JKW443M	MILLER	FORD	SV1056	Temporary Staff

CREW_ID	FIRST_NAME	LAST_NAME	FLIGHT_NUM	SERVICE_TYPE
ANH178H	CLARK	KING	CV335	Full Time Placement
JKW443M	MILLER	FORD	SV1056	Temporary Staff
LME284F	ALELEN	TURNER	SV500	Temporary Staff
OZQ035Z	SMITH	BLAKE	EK1	Full Time Placement
LAW630B	JONES	TURNER	SV1642	Full Time Placement

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5 rows selected.



6-Pilot Table

Join:

SELECT Crew_ID,first_name,last_name,Pilot_license,Flight_NUM FROM Crew NATURAL JOIN Pilot

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SQL Worksheet Clear Find Actions Save Run

```

93
94
95 CREATE TABLE Pilot(
96   Crew_ID Varchar2(30),
97   Pilot_license VARCHAR2(30),
98   CONSTRAINT Pilot_FK FOREIGN KEY (Crew_ID) REFERENCES Crew (Crew_ID)
99 );
100
101 DESCRIBE Pilot;
102 insert into Pilot Values ('QWE165G', '94398570');
103 insert into Pilot Values ('FVH548V', '63218755');
104 insert into Pilot Values ('KIS043F', '14685485');
105 insert into Pilot Values ('DZM364G', '37548750');
106 insert into Pilot Values ('LAG829A', '03794693');
107
108 -- JOIN
109 SELECT Crew_ID,first_name,last_name,Pilot_license,Flight_NUM FROM Crew NATURAL JOIN Pilot ;

```

CREW_ID	FIRST_NAME	LAST_NAME	PILOT_LICENSE	FLIGHT_NUM
QWE165G	ADAM	TURNER	94398570	CV335
FVH548V	JAMES	FORD	63218755	SV1056
KIS043F	SCOTT	BLAKE	14685485	SV500
DZM364G	BLAKE	FORD	37548750	EK1
LAG829A	JONES	KING	03794693	SV1642

CREW_ID	FIRST_NAME	LAST_NAME	PILOT_LICENSE	FLIGHT_NUM
QWE165G	ADAM	TURNER	94398570	CV335
FVH548V	JAMES	FORD	63218755	SV1056
KIS043F	SCOTT	BLAKE	14685485	SV500
DZM364G	BLAKE	FORD	37548750	EK1
LAG829A	JONES	KING	03794693	SV1642

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5 rows selected.



7-Booking Table

Where:

SELECT Booking_NUM,Date_depart,Date_return,Price,Email,passport_num,Luggage,Flight_NUM FROM Booking WHERE Price > 2500

Live SQL

SQL Worksheet

```

109 CREATE TABLE Booking(
110     Booking_NUM NUMBER(20),
111     Date_depart DATE,
112     Date_return DATE,
113     Price NUMBER(20),
114     Email VARCHAR2(30),
115     passport_num VARCHAR2(30),
116     Luggage NUMBER(20),
117     Flight_NUM VARCHAR2(30),
118
119     CONSTRAINT BookingPK PRIMARY KEY (Booking_NUM),
120     CONSTRAINT FlightBooking_FK FOREIGN KEY (Flight_NUM) REFERENCES Flight (Flight_NUM)
121 );
122 DESCRIBE Booking;
123 insert into Booking values(301,'25-NOV-2022','04-DEC-2022',2000,'h@hotmail.com','T450',2,'CV335');
124 insert into Booking values(302,'26-NOV-2022','05-DEC-2022',2200,'f@hotmail.com','T500',1,'EK1');
125 insert into Booking values(303,'27-NOV-2022','07-DEC-2022',2600,'r@hotmail.com','T550',2,'SV1056');
126 insert into Booking values(304,'30-NOV-2022','10-DEC-2022',2800,'j@hotmail.com','T600',1,'SV500');
127 insert into Booking values(305,'10-DEC-2022','20-DEC-2022',2500,'d@hotmail.com','T700',2,'SV1642');
128 -- WHERE
129 SELECT Booking_NUM,Date_depart,Date_return,Price,Email,passport_num,Luggage,Flight_NUM FROM Booking WHERE Price > 2500;
  
```

BOOKING_NUM	DATE_DEPART	DATE_RETURN	PRICE	EMAIL	PASSPORT_NUM	LUGGAGE	FLIGHT_NUM
303	27-NOV-22	07-DEC-22	2600	r@hotmail.com	T550	2	SV1056
304	30-NOV-22	10-DEC-22	2800	j@hotmail.com	T600	1	SV500

BOOKING_NUM	DATE_DEPART	DATE_RETURN	PRICE	EMAIL	PASSPORT_NUM	LUGGAGE	FLIGHT_NUM
303	27-NOV-22	07-DEC-22	2600	r@hotmail.com	T550	2	SV1056
304	30-NOV-22	10-DEC-22	2800	j@hotmail.com	T600	1	SV500

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2 rows selected.

8- Passenger Table

Order by:

SELECT name_passenger,passport_num,Date_of_birth,passport_expiry_date,phone,Booking_num FROM Passenger ORDER BY Passenger.name_passenger

Live SQL

SQL Worksheet

```

128 -- WHERE
129 SELECT Booking_NUM,Date_depart,Date_return,Price,Email,passport_num,Luggage,Flight_NUM FROM Booking WHERE Price > 2500;
130
131 CREATE TABLE Passenger(
132 passport_num VARCHAR2(30),
133 name_passenger VARCHAR2(30),
134 phone NUMBER(20),
135 Date_of_birth VARCHAR2(30),
136 passport_expiry_date VARCHAR2(30),
137 Booking_num NUMBER(20),
138 CONSTRAINT PASS_PK PRIMARY KEY (passport_num),
139 CONSTRAINT Booking_num FOREIGN KEY (Booking_num) REFERENCES Booking(Booking_num)
140 );
141
142 DESCRIBE Passenger;
143 Insert into Passenger values('T450','Hala sarwi','966561077363','24-SEP-2002','30-JAN-2025',301);
144 Insert into Passenger values('T500','Fatinah Alharatani','966554045353','05-JAN-2001','05-MAY-2025',302);
145 Insert into Passenger values('T550','Reem alsayed','966503004142','07-DEC-2002','07-JAN-2025',303);
146 Insert into Passenger values('T600','Haneen alghamdi','966553559702','10-JUNE-2002','06-JAN-2025',304);
147 Insert into Passenger values('T700','danah bawajeeh','966502433687','10-SEP-2002','30-NOV-2025',305);
148 -- ORDER BY
149 SELECT name_passenger,passport_num,Date_of_birth,passport_expiry_date,phone,Booking_num FROM Passenger ORDER BY Passenger.name_passenger;

```

NAME_PASSENGER	PASSPORT_NUM	DATE_OF_BIRTH	PASSPORT_EXPIRY_DATE	PHONE	BOOKING_NUM
Hala sarwi	T450	24-SEP-2002	30-JAN-2025	966561077363	301
Haneen alghamdi	T600	10-JUNE-2002	06-JAN-2025	966553559702	304

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NAME_PASSENGER	PASSPORT_NUM	DATE_OF_BIRTH	PASSPORT_EXPIRY_DATE	PHONE	BOOKING_NUM
Hala sarwi	T450	24-SEP-2002	30-JAN-2025	966561077363	301
Haneen alghamdi	T600	10-JUNE-2002	06-JAN-2025	966553559702	304
Reem alsayed	T550	07-DEC-2002	07-JAN-2025	966503004142	303
danah bawajeeh	T700	10-SEP-2002	30-NOV-2025	966502433687	305
fatinah Alharatani	T500	05-JAN-2001	05-MAY-2025	966554045353	302

Download CSV

5 rows selected.



9-Passenger Table

SUBQUERY:

SELECT name_passenger,passport_num, passport_expiry_date FROM Passenger WHERE
name_passenger = ANY(SELECT name_passenger FROM Passenger WHERE Booking_num=301)

Live SQL

SQL Worksheet

```

130
131 CREATE TABLE Passenger(
132     passport_num VARCHAR2(30),
133     name_passenger VARCHAR2(30),
134     phone NUMBER(20),
135     Date_of_birth VARCHAR2(30),
136     passport_expiry_date VARCHAR2(30),
137     Booking_num NUMBER(20),
138     CONSTRAINT PASS_PK PRIMARY KEY (passport_num),
139     CONSTRAINT Booking_num FOREIGN KEY (Booking_num) REFERENCES Booking(Booking_num)
140 );
141
142 DESCRIBE Passenger;
143 insert into Passenger values('T450','Hala sarwi',966561077363,'24-SEP-2002','30-JAN-2025',301);
144 insert into Passenger values('T500','Fatimah Alharatani',966554045355,'05-JAN-2001','05-MAY-2025',302);
145 insert into Passenger values('T550','Reem alsayed',966503004142,'07-DEC-2002','07-JAN-2025',303);
146 insert into Passenger values('T600','Hameem alghamdi',96653559702,'10-JUNE-2002','06-JAN-2025',304);
147 insert into Passenger values('T700','danah bawajeih',966502433687,'10-SEP-2002','30-NOV-2025',305);
148 -- ORDER BY
149 SELECT name_passenger,passport_num,Date_of_birth,passport_expiry_date,phone,Booking_num FROM Passenger ORDER BY Passenger.name_passenger;
150 -- SUBQUERY
151 SELECT name_passenger,passport_num, passport_expiry_date FROM Passenger WHERE name_passenger = ANY(SELECT name_passenger FROM Passenger WHERE Booking_num=301);

```

NAME_PASSENGER	PASSPORT_NUM	PASSPORT_EXPIRY_DATE
Hala sarwi	T450	30-JAN-2025

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NAME_PASSENGER	PASSPORT_NUM	PASSPORT_EXPIRY_DATE
Hala sarwi	T450	30-JAN-2025

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10-Bording_pass Table

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SQL Worksheet

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```

152 CREATE TABLE Bording_pass
153 (
154     Passport_num VARCHAR2(30),
155     Flight_num VARCHAR2(30),
156     Bording_Time VARCHAR2(30),
157     Bording_Date date,
158     Seat VARCHAR2(30),
159     Bording_class VARCHAR2(30),
160     Gate VARCHAR2(30),
161     CONSTRAINT BORDING_PK PRIMARY KEY (passport_num,Flight_num)
162 );
163
164 DESCRIBE Bording_pass;
165 insert into Bording_pass values('T450','CV335','2:00','25-NOV-2022','20A','Economic','E71');
166 insert into Bording_pass values('T500','EK1','13:30','26-NOV-2022','1B','First class','G21');
167 insert into Bording_pass values('T550','SV1056','1:00','27-NOV-2022','8C','Business','F21');
168 insert into Bording_pass values('T600','SV500','16:05','30-NOV-2022','10D','Business','H5');
169 insert into Bording_pass values('T700','SV1642','23:40','10-DEC-2022','15B','Economic','F10');
170
171 SELECT*FROM Bording_pass;
172

```

PASSPORT_NUM	FLIGHT_NUM	BORDING_TIME	BORDING_DATE	SEAT	BORDING_CLASS	GATE
T450	CV335	2:00	25-NOV-22	20A	Economic	E71
T500	EK1	13:30	26-NOV-22	1B	First class	G21
T550	SV1056	1:00	27-NOV-22	8C	Business	F21
T600	SV500	16:05	30-NOV-22	10D	Business	H5
T700	SV1642	23:40	10-DEC-22	15B	Economic	F10



11Meal Table:

Aggregate function:

SELECT COUNT(Meal_num) AS MEAL_NUMBER, Main_meal AS MEAL_NAME FROM Meal GROUP BY Main_meal ;

Live SQL

SQL Worksheet

```

170 CREATE TABLE Meal
171 (
172     Meal_num number(20) primary key,
173     Plane_ID number(20),
174     Main_meal varchar(30),
175     Drinks varchar(30),
176     Snacks varchar(30)
177 );
178
179 DESCRIBE Meal;
180 ALTER TABLE Meal add constraint Plane_ID_fk FOREIGN KEY (Plane_ID) REFERENCES Airplane (Plane_ID);
181
182 insert into Meal values(2,501,'Normal Meal','Orange juice','Dark chocolate');
183 insert into Meal values(3,501,'Law calorie meal','Carrot juice','Fruits');
184 insert into Meal values(1,300,'No salt meal','Apples juice','Oat biscuit');
185 insert into Meal values(4,2001,'Child Meal','Apples juice','Chips');
186 insert into Meal values(3,901,'Law calorie meal','Carrot juice','Dark chocolate');
187 -- AGGREGATE FUNCTION / GROUP BY
188 SELECT COUNT(Meal_num) AS MEAL_NUMBER, Main_meal AS MEAL_NAME FROM Meal GROUP BY Main_meal ;
  
```

MEAL_NUMBER	MEAL_NAME
1	No salt meal
1	Normal Meal
1	Child Meal
2	Law calorie meal

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MEAL_NUMBER	MEAL_NAME
1	No salt meal
1	Normal Meal
1	Child Meal
2	Law calorie meal

Download CSV

4 rows selected.