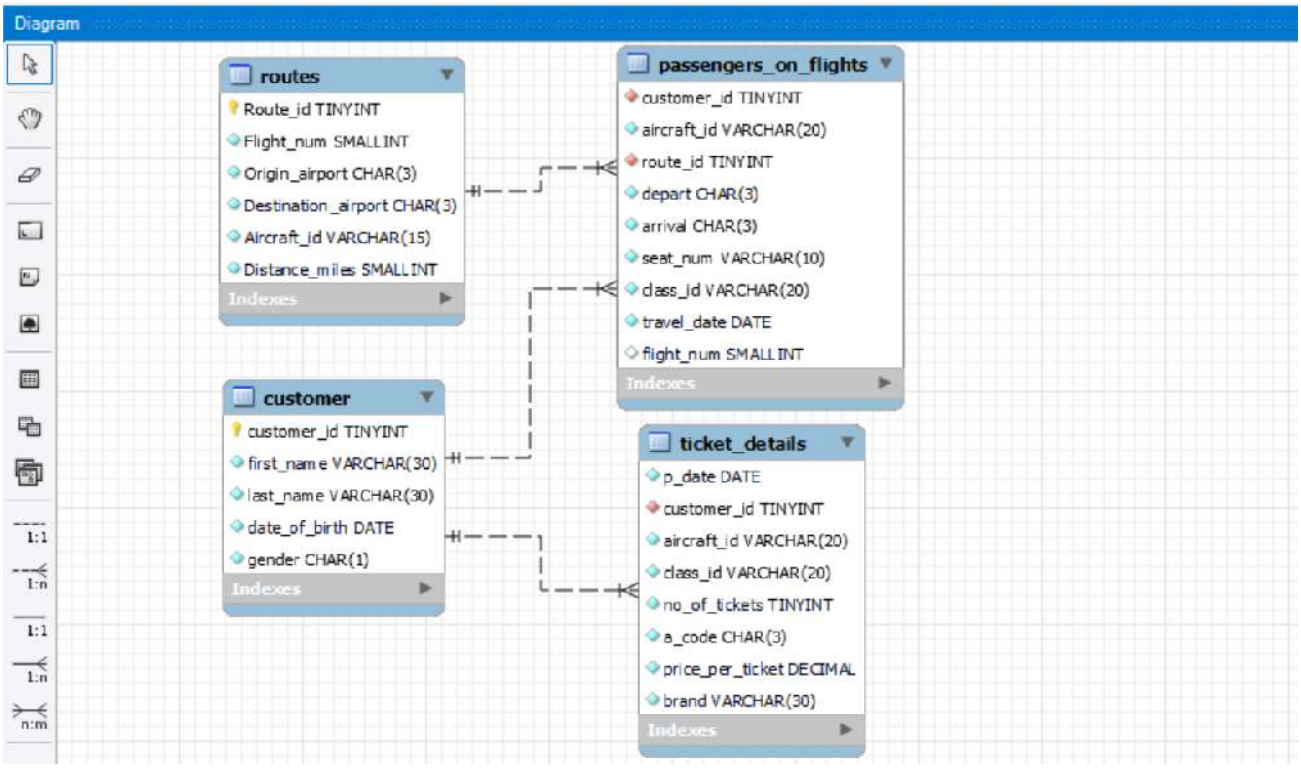
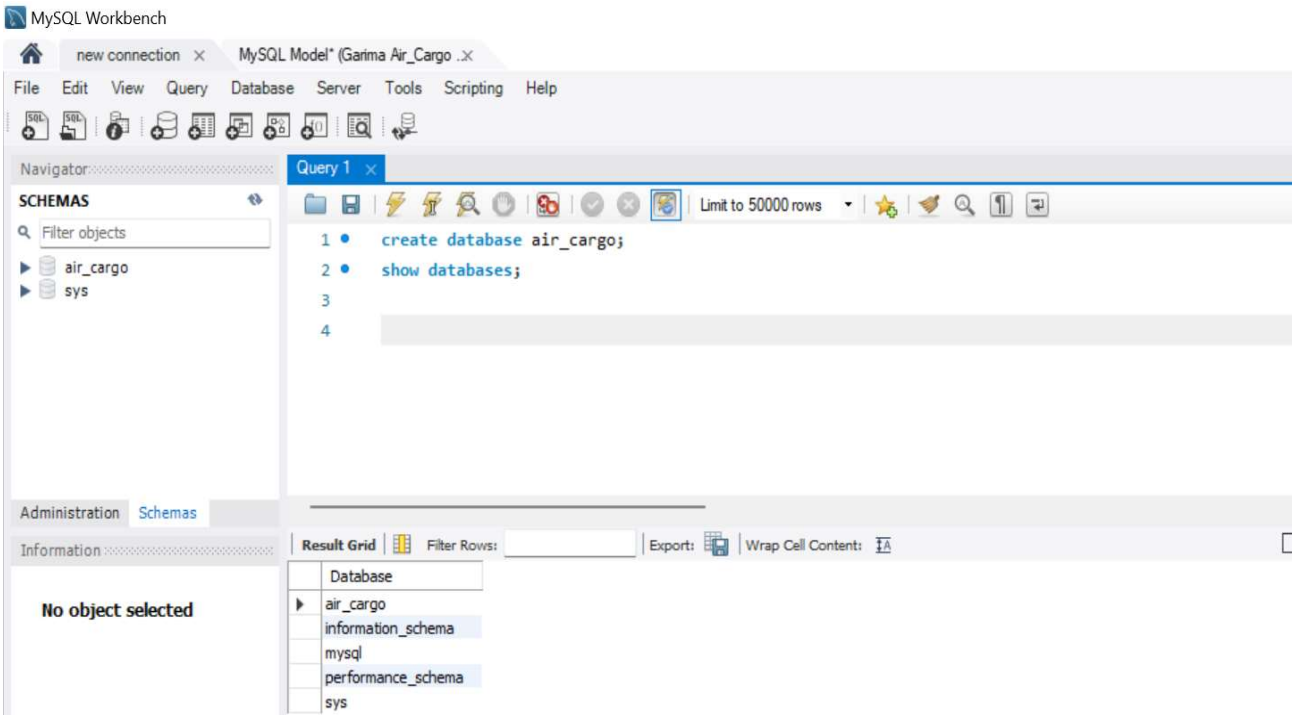
1) Create an ER diagram for the given airlines database.



2) Write a query to create route_details table using suitable data types for the fields, such as route_id, flight_num, origin_airport, destination_airport, aircraft_id, and distance_miles. Implement the check constraint for the flight number and unique constraint for the route_id fields. Also, make sure that the distance miles field is greater than 0.



MySQL Workbench

new connection | MySQL Model* (Garima Air_Cargo .. | EER Diagram

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Navigator

SCHEMAS

Filter objects

- air_cargo
  - Tables
  - Views
  - Stored Procedures
  - Functions
- sys

Administration Schemas

Information

No object selected

Query 1

Limit to 50000 rows

```
use air_cargo;
create table customer (
    customer_id     tinyint not null primary key,
    first_name      varchar(30) not null,
    last_name       varchar(30) not null,
    date_of_birth   date not null,
    gender          char(1) not null
);
describe customer;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Field	Type	Null	Key	Default	Extra
customer_id	tinyint	NO	PRI	NULL	
first_name	varchar(30)	NO		NULL	
last_name	varchar(30)	NO		NULL	
date_of_birth	date	NO		NULL	
gender	char(1)	NO		NULL	

MySQL Workbench

new connection | MySQL Model* (Garima Air_Cargo .. | EER Diagram

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Navigator

SCHEMAS

Filter objects

- air_cargo
  - Tables
  - Views
  - Stored Procedures
  - Functions
- sys

Administration Schemas

Information

No object selected

Query 1

Limit to 50000 rows

```
create table customer (
    customer_id     tinyint not null primary key,
    first_name      varchar(30) not null,
    last_name       varchar(30) not null,
    date_of_birth   date not null,
    gender          char(1) not null
);
describe customer;
select * from customer;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

customer_id	first_name	last_name	date_of_birth	gender
1	Julie	Sam	12-01-1989	F
2	Steve	Ryan	03-04-1983	M
3	Morris	Lois	09-12-1993	M
4	Cathenna	Emily	14-09-1977	F
5	Aaron	Kim	18-02-1991	M
6	Alexander	Scot	12-02-1985	M
7	Anderson	Stewart	11-01-1992	M
8	Floyd	Ted	21-02-1993	M
9	Leo	Travis	22-03-1994	M

```
);
describe customer;
select * from customer;

create table routes (
    Route_id        tinyint not null unique primary key,
    Flight_num      smallint constraint check_1 check (Flight_num is not null),
    Origin_airport  char(3)     not null,
    Destination_airport     char(3) not null,
    Aircraft_id     varchar(15) not null,
    Distance_miles  smallint not null constraint check_2 check (distance_miles > 0)
);
describe routes;
```

Field	Type	Null	Key	Default	Extra
route_id	int	YES		NULL	
flight_num	int	YES		NULL	
origin_airport	text	YES		NULL	
destination_airport	text	YES		NULL	
aircraft_id	text	YES		NULL	
distance_miles	int	YES		NULL	

```
    Flight_num      smallint constraint check_1 check (Flight_num is not null),
    Origin_airport  char(3)     not null,
    Destination_airport     char(3) not null,
    Aircraft_id     varchar(15) not null,
    Distance_miles  smallint not null constraint check_2 check (distance_miles > 0)
);
describe routes;

select * from routes;
```

route_id	flight_num	origin_airport	destination_airport	aircraft_id	distance_miles
1	1111	EWR	HNL	767-301ER	4962
2	1112	HNL	EWR	767-301ER	4962
3	1113	EWR	LHR	A321	3466
4	1114	JFK	LAX	767-301ER	2475
5	1115	LAX	JFK	767-301ER	2475
6	1116	HNL	LAX	767-301ER	2556
7	1117	LAX	ORD	A321	1745
8	1118	ORD	EWR	A321	719
9	1119	DEN	LAX	ERJ142	862
10	1120	HNL	DEN	A321	3365
12	1122	ABI	ADK	767-301ER	4300

MySQL Workbench

new connection | MySQL Model* (Garima Air_Cargo ... | EER Diagram

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Navigator

SCHEMAS

Filter objects

- air_cargo
  - Tables
    - customer
  - Views
  - Stored Procedures
  - Functions
- sys

Administration Schemas

Information

No object selected

Query 1

Limit to 50000 rows

```
26 • create table passengers_on_flights (
27       customer_id     tinyint not null references customer(customer_id),
28       aircraft_id     varchar(20) not null,
29       route_id        tinyint not null references route(route_id),
30       depart          char(3) not null,
31       arrival         char(3) not null,
32       seat_num        varchar(10) not null,
33       class_id        varchar(20) not null,
34       travel_date     date not null,
35       flight_num      smallint not null);
36 • describe passengers_on_flights;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Field	Type	Null	Key	Default	Extra
customer_id	tinyint	NO		NULL	
aircraft_id	varchar(20)	NO		NULL	
route_id	tinyint	NO		NULL	
depart	char(3)	NO		NULL	
arrival	char(3)	NO		NULL	
seat_num	varchar(10)	NO		NULL	
class_id	varchar(20)	NO		NULL	
travel_date	date	NO		NULL	
flight_num	smallint	NO		NULL	

Navigator

SCHEMAS

Filter objects

- air_cargo
  - Tables
    - customer
    - passengers_on_flights
    - routes
  - Views
  - Stored Procedures
  - Functions
- sys

Administration Schemas

Information

No object selected

Query 1

Limit to 50000 rows

```
32       seat_num        varchar(10) not null,
33       class_id        varchar(20) not null,
34       travel_date     date not null,
35       flight_num      smallint not null);
36 • describe passengers_on_flights;
37 • select * from passengers_on_flights;
38
39
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

customer_id	aircraft_id	route_id	depart	arrival	seat_num	class_id	travel_date	flight_num
2	A321	34	CRW	COD	01B	Bussiness	26-01-2019	1117
2	767-301ER	4	JFK	LAX	01E	Economy	02-09-2018	1114
1	ERJ142	9	DEN	LAX	01EP	Economy Plus	26-12-2019	1119
1	CRJ900	30	BUR	STT	01FC	First Class	04-11-2018	1140
5	767-301ER	12	ABI	ADK	02B	Bussiness	02-07-2018	1122
5	ERJ142	18	ANI	BGR	02E	Economy	06-05-2020	1128
8	A321	38	CST	DAL	02EP	Economy Plus	09-08-2020	1148
4	767-301ER	5	LAX	JFX	02FC	First Class	06-04-2020	1115
7	767-301ER	20	AVL	BOI	03B	Bussiness	08-07-2020	1130
5	ERJ142	22	BGR	BJI	03E	Economy	31-05-2020	1132
11	ERJ142	31	BTM	CHA	03EP	Economy Plus	02-08-2018	1141
4	767-301ER	4	JFK	LAX	03FC	First Class	30-04-2020	1114
11	767-301ER	5	LAX	JFX	04B	Bussiness	12-11-2020	1115

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Navigator

SCHEMAS

Filter objects

- air_cargo
  - Tables
    - customer
    - passengers_on_flights
    - routes
  - Views
  - Stored Procedures
  - Functions
- sys

Administration Schemas

Information

No object selected

Query 1

Limit to 50000 rows

```
39 • create table ticket_details (
40       p_date          date not null,
41       customer_id     tinyint not null references customer(customer_id),
42       aircraft_id     varchar(20) not null,
43       class_id        varchar(20) not null,
44       no_of_tickets   tinyint not null,
45       a_code          char(3) not null,
46       price_per_ticket decimal(5,2) not null,
47       brand           varchar(30) not null
48   );
49 • describe ticket_details;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Field	Type	Null	Key	Default	Extra
p_date	date	NO		NULL	
customer_id	tinyint	NO		NULL	
aircraft_id	varchar(20)	NO		NULL	
class_id	varchar(20)	NO		NULL	
no_of_tickets	tinyint	NO		NULL	
a_code	char(3)	NO		NULL	
price_per_ticket	decimal(5,2)	NO		NULL	
brand	varchar(30)	NO		NULL	

MySQL Workbench

new connection | MySQL Model* (Garima Air_Cargo .. | EER Diagram

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Navigator

SCHEMAS

Filter objects

- air_cargo
  - Tables
    - customer
    - passengers_on_flights
    - routes
    - ticket_details
  - Views
  - Stored Procedures
  - Functions
- sys

Administration Schemas

Information

No object selected

Query 1

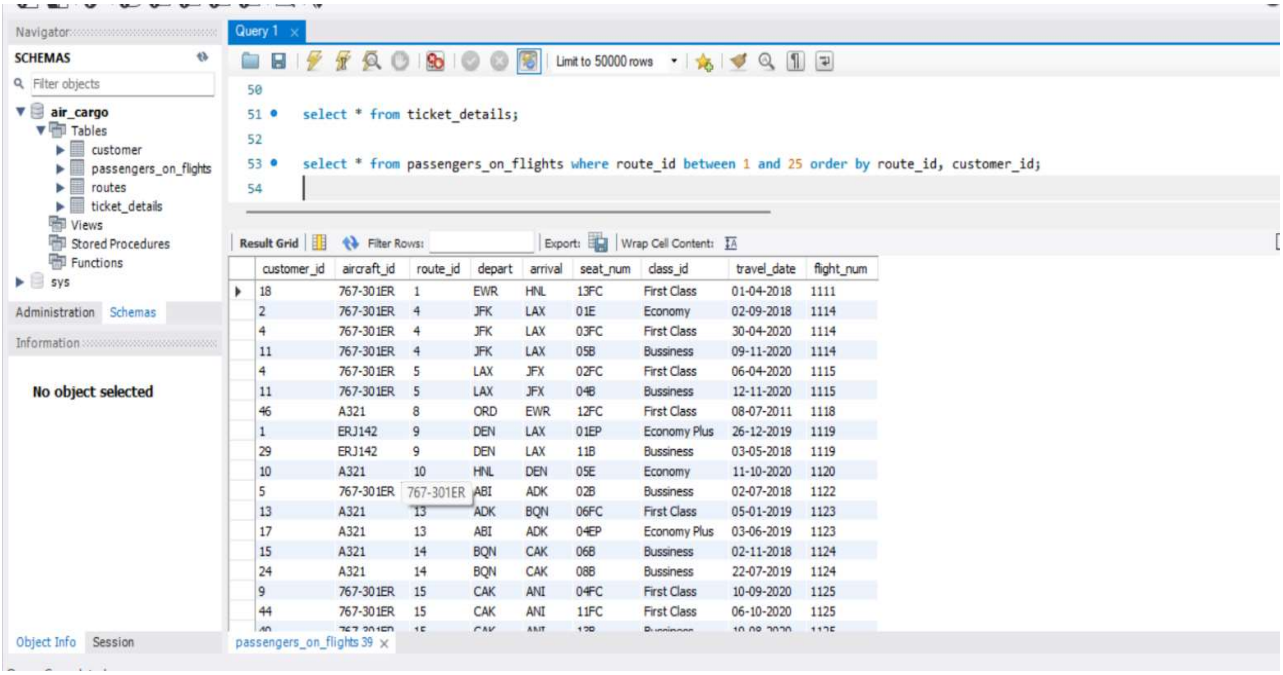
Limit to 50000 rows

```
44       no_of_tickets   tinyint not null,
45       a_code          char(3) not null,
46       price_per_ticket decimal(5,2) not null,
47       brand           varchar(30) not null
48   );
49 • describe ticket_details;
50
51 • select * from ticket_details;
52
```

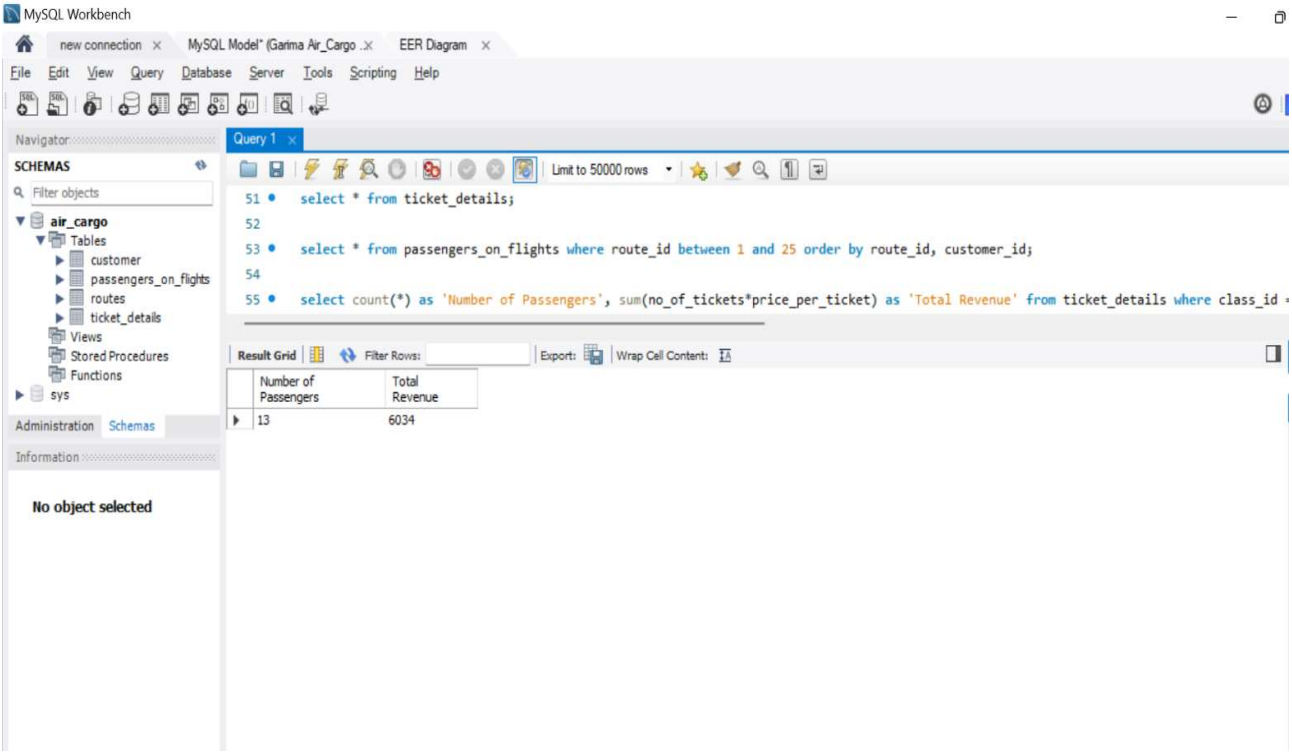
Result Grid | Filter Rows: | Export: | Wrap Cell Content:

p_date	customer_id	aircraft_id	class_id	no_of_tickets	a_code	Price_per_ticket	brand
26-12-2018	27	767-301ER	Economy	1	DAL	130	Emirates
02-02-2020	22	ERJ142	Economy Plus	1	AGB	220	Jet Airways
03-03-2020	21	CRJ900	Bussiness	1	BOH	490	Bristish Airways
04-04-2020	4	767-301ER	First Class	1	AGB	390	Emirates
05-05-2020	5	ERJ142	Economy	1	CTM	120	Jet Airways
07-07-2020	7	767-301ER	Bussiness	1	BFS	430	Emirates
08-08-2020	8	A321	Economy Plus	1	DAL	275	Qatar Airways
09-09-2020	9	767-301ER	First Class	1	BOH	380	Emirates
10-10-2020	10	A321	Economy	1	MCO	135	Qatar Airways
11-11-2020	11	767-301ER	Bussiness	1	AGB	465	Emirates
12-12-2020	19	CRJ900	Economy Plus	1	DEN	225	Bristish Airways
01-01-2019	13	A321	First Class	1	YVR	395	Qatar Airways

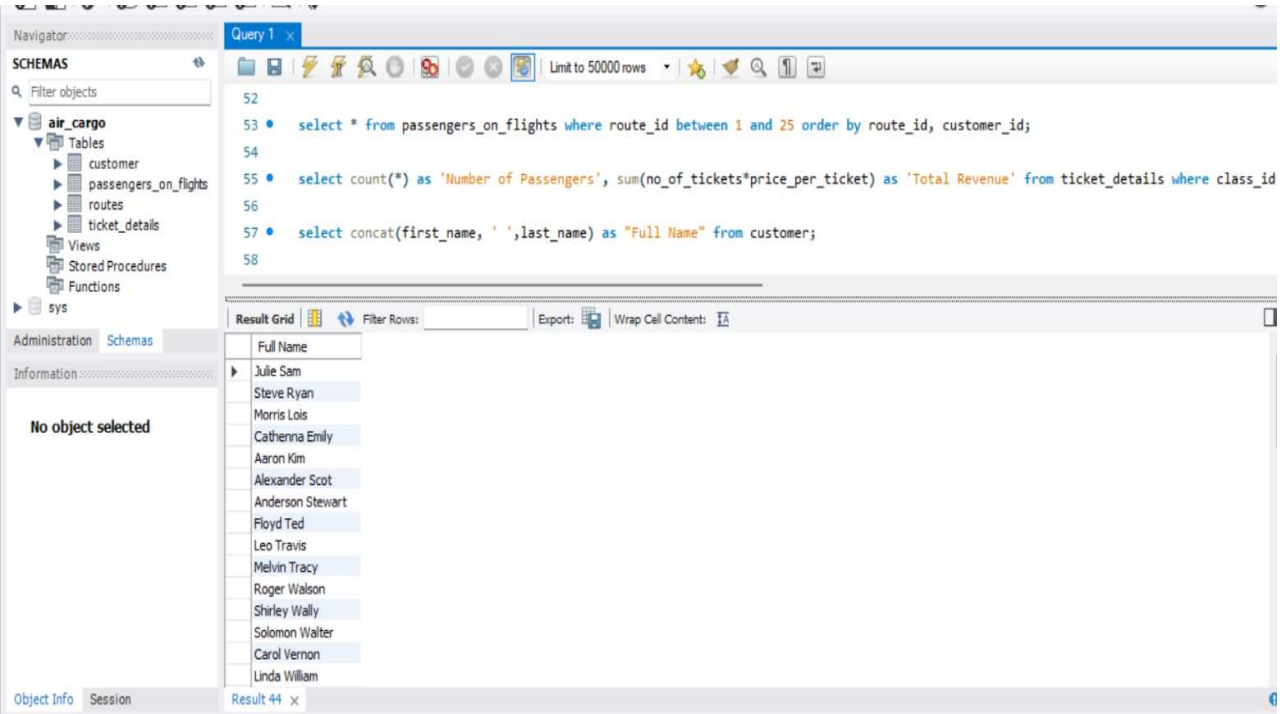
3) Write a query to display all the passengers (customers) who have travelled in routes 01 to 25. Take data from the passengers_on_flights table.



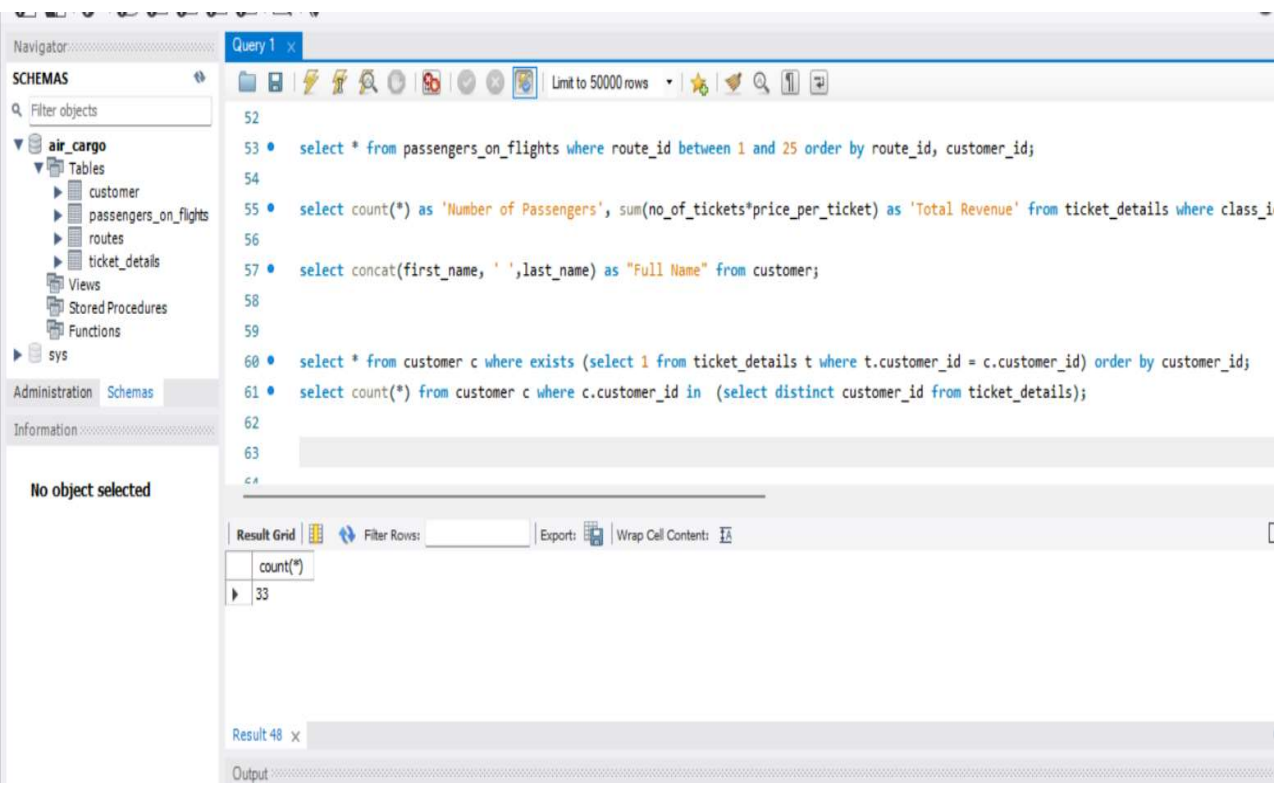
4) Write a query to identify the number of passengers and total revenue in business class from the ticket_details table.



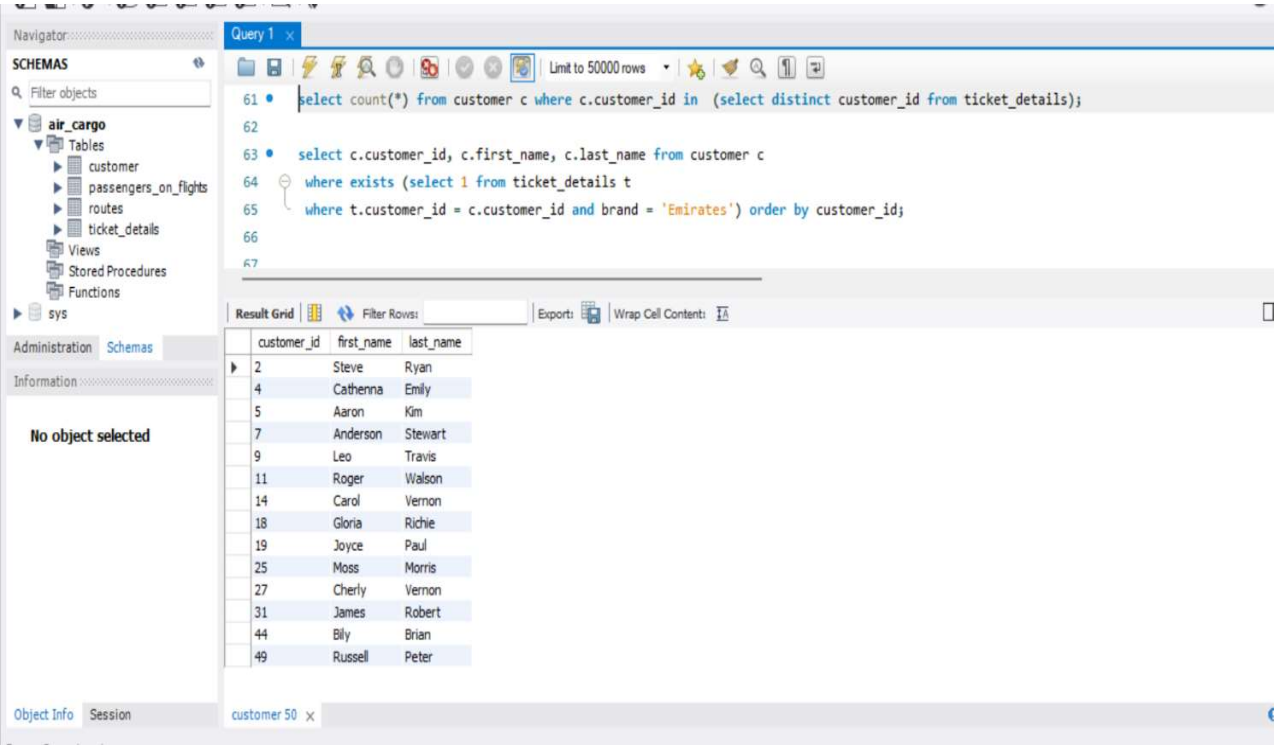
5) Write a query to display the full name of the customer by extracting the first name and last name from the customer table.



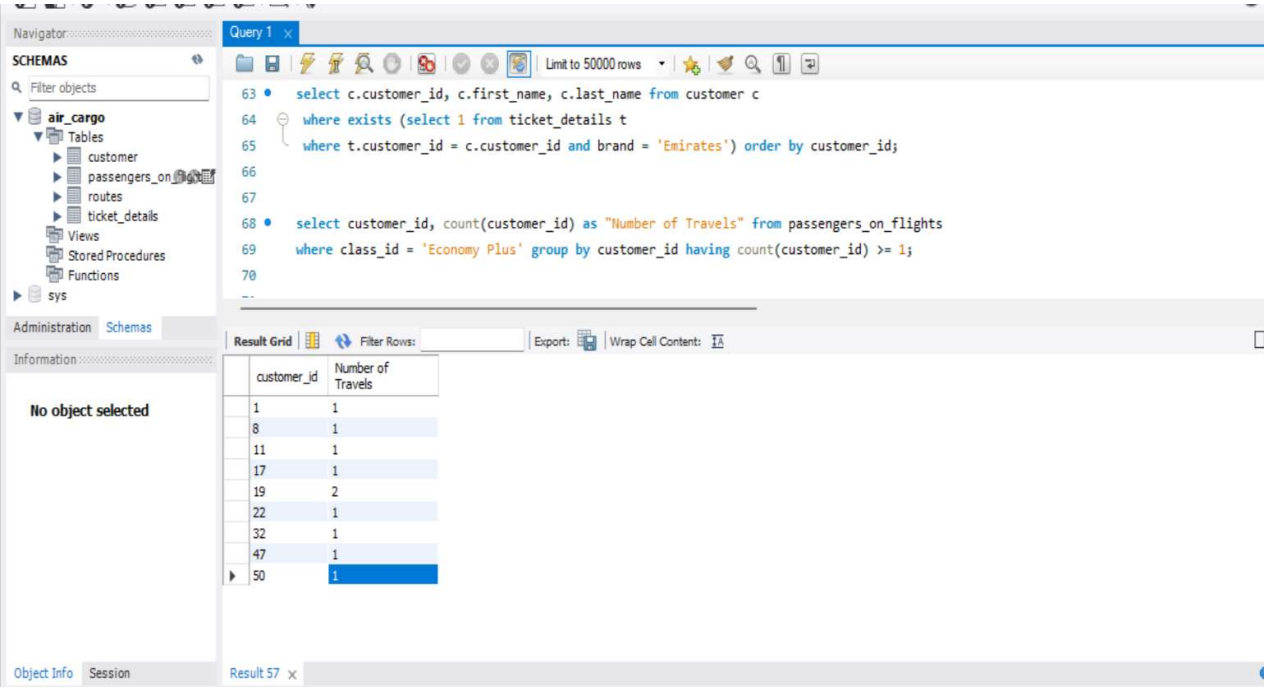
6) Write a query to extract the customers who have registered and booked a ticket. Use data from the customer and ticket_details tables.



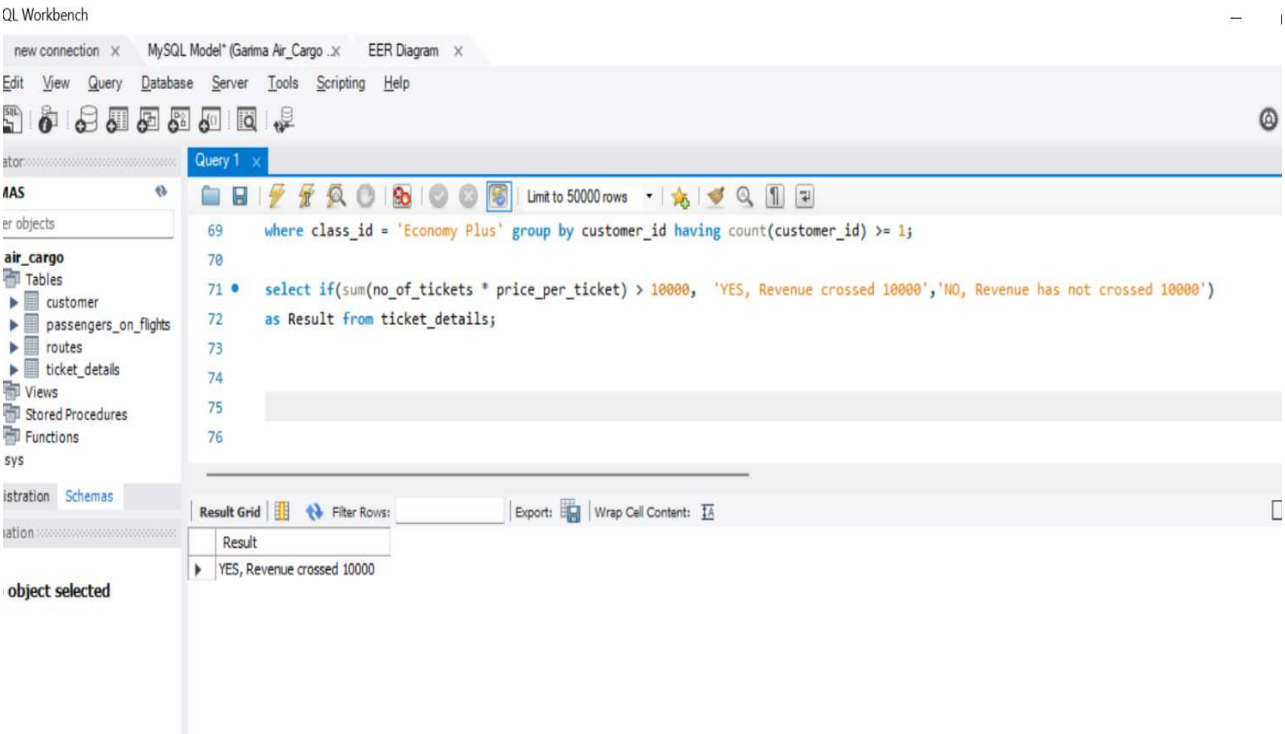
7) Write a query to identify the customer's first name and last name based on their customer ID and brand (Emirates) from the ticket_details table.



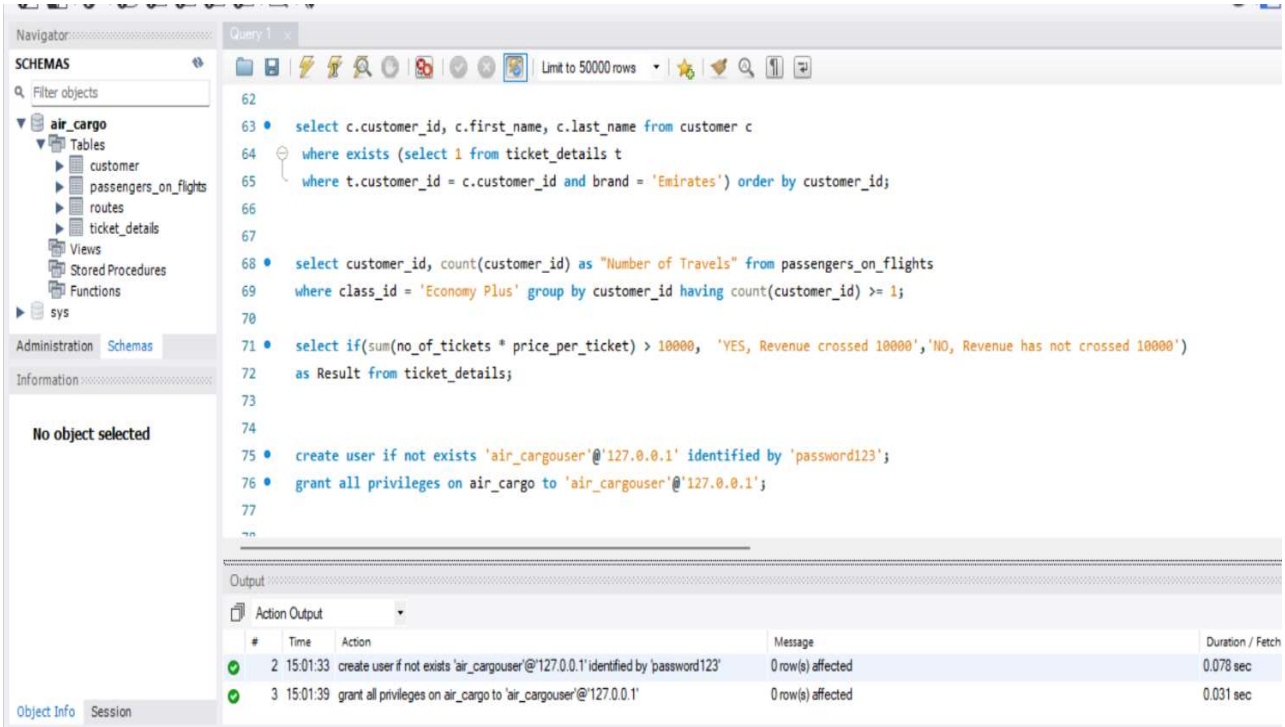
8) Write a query to identify the customers who have travelled by *Economy Plus* class using Group by and Having clause on the passengers_on_flights table.



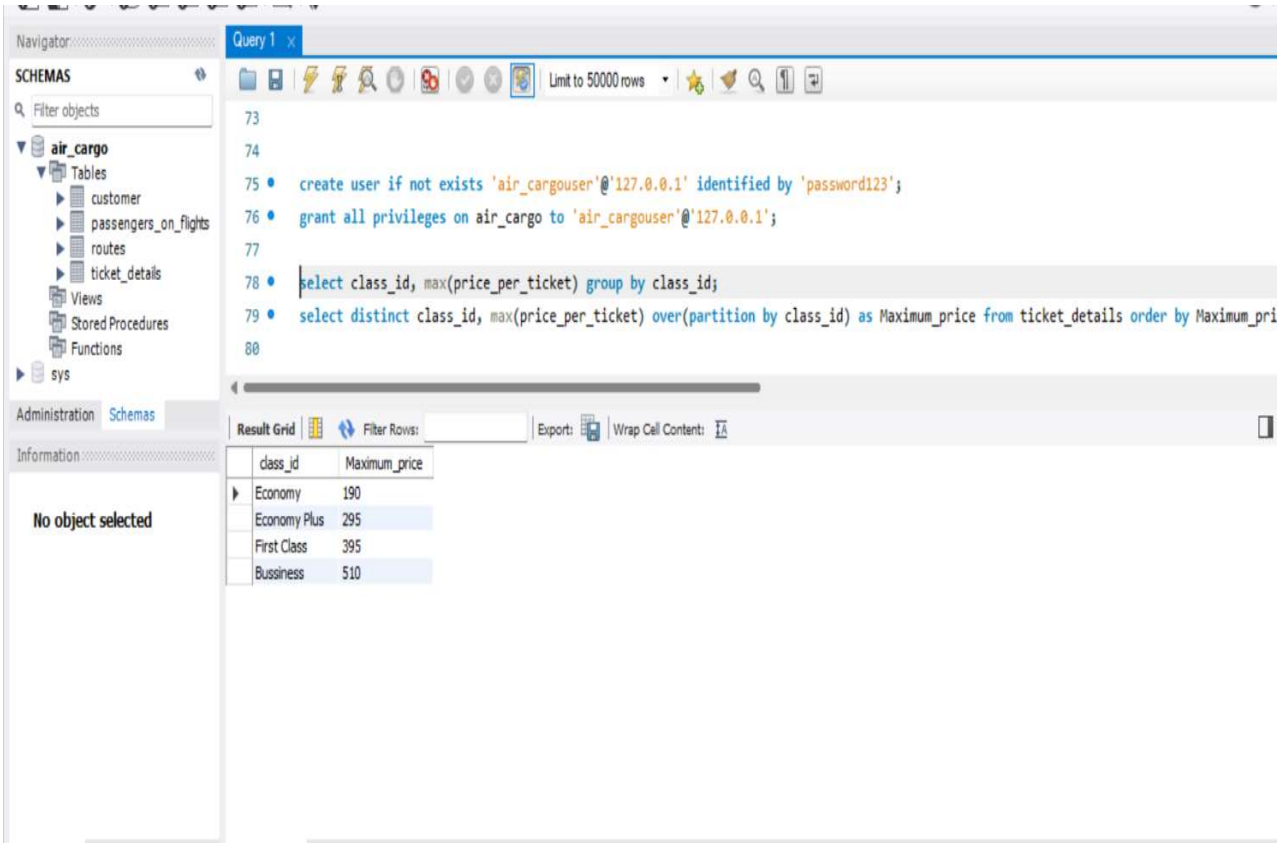
9) Write a query to identify whether the revenue has crossed 10000 using the IF clause on the ticket_details table.



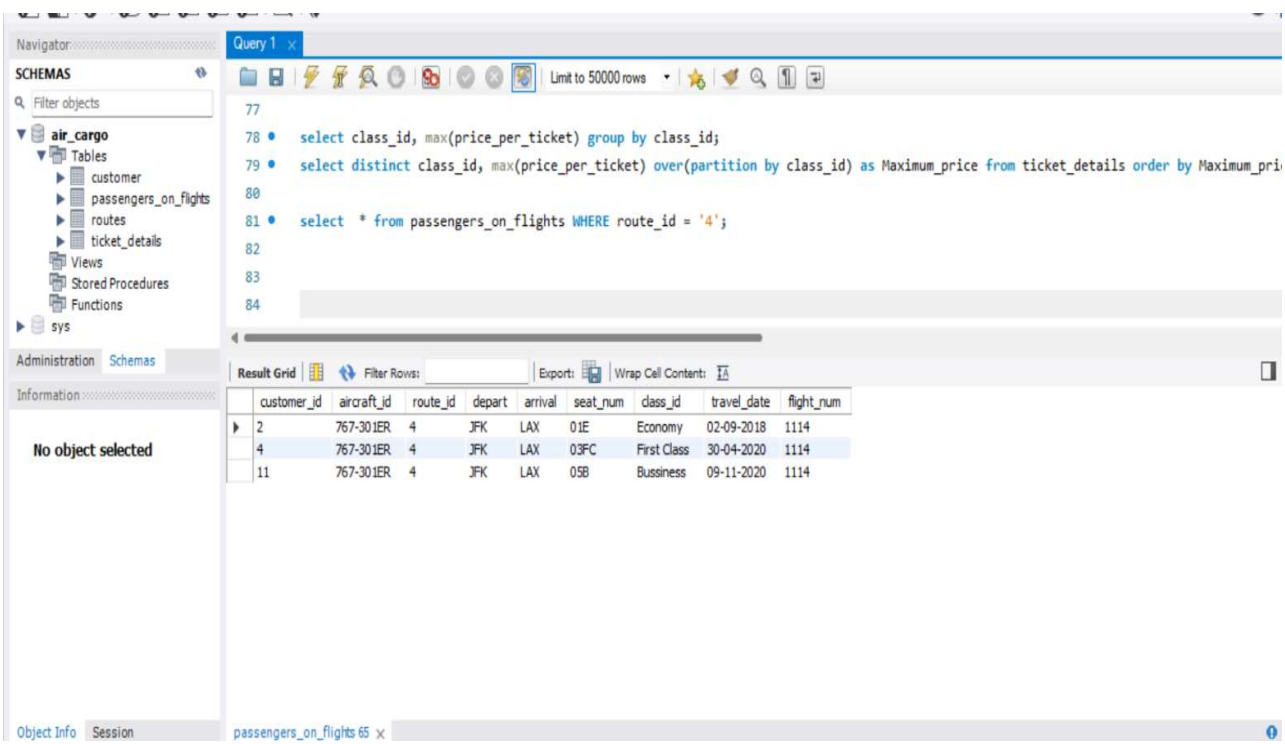
10) Write a query to create and grant access to a new user to perform operations on a database.



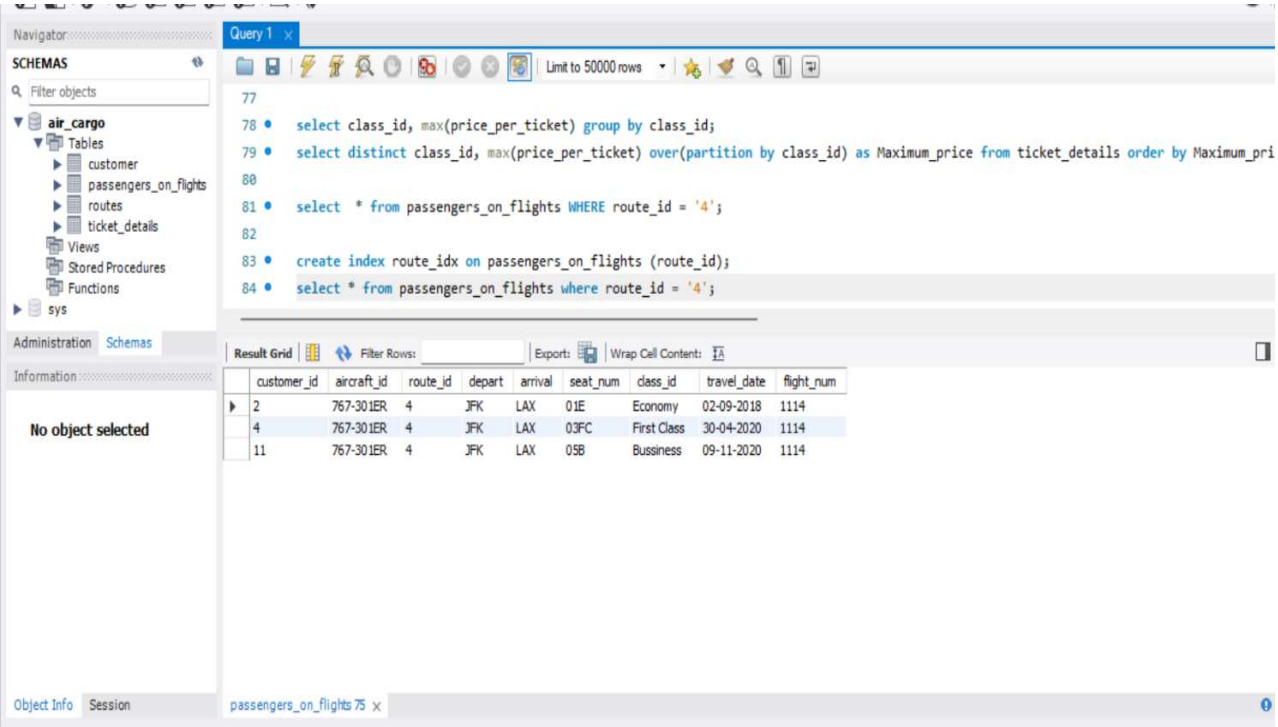
11)Write a query to find the maximum ticket price for each class using window functions on the ticket_details table.



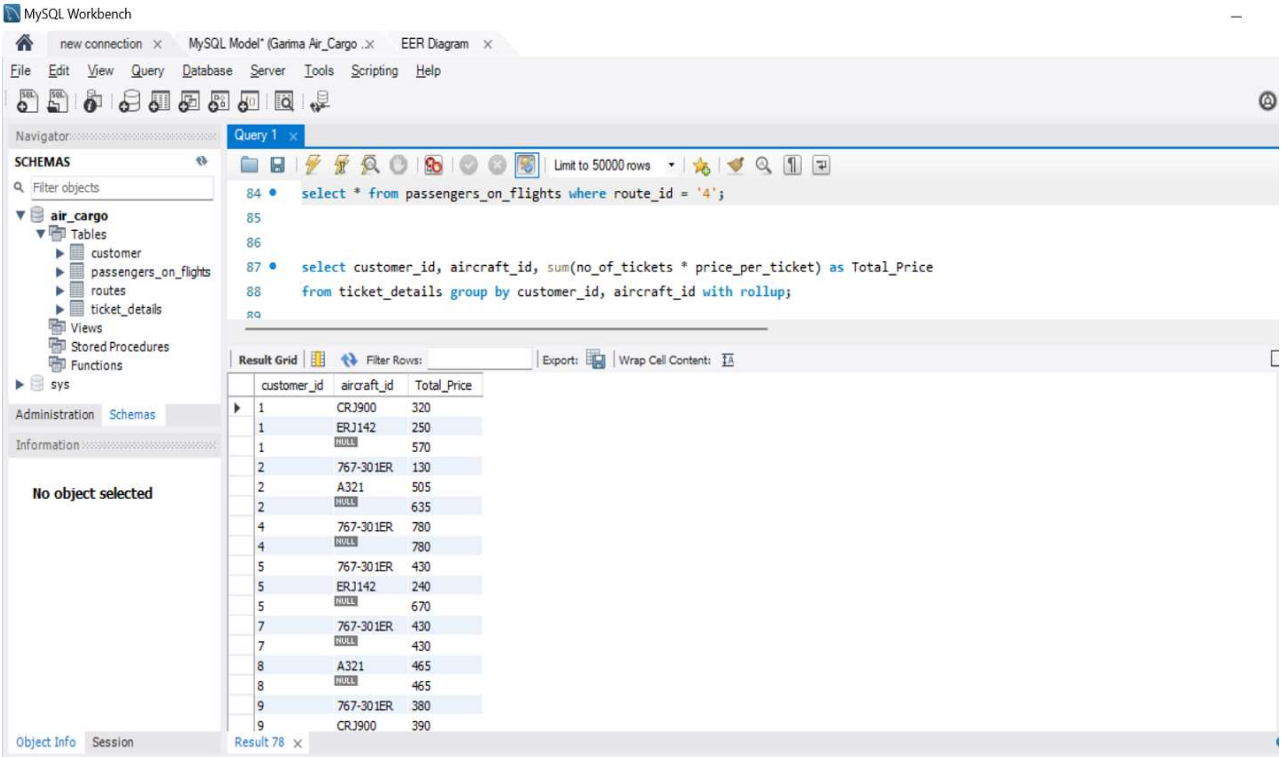
12)Write a query to extract the passengers whose route ID is 4 by improving the speed and performance of the passengers_on_flights table.



13)For the route ID 4, write a query to view the execution plan of the passengers_on_flights table.



14) Write a query to calculate the total price of all tickets booked by a customer across different aircraft IDs using rollup function.



15)Write a query to create a view with only business class customers along with the brand of airlines.

```
from ticket_details group by customer_id, aircraft_id with rollup;

create view Business_classes as
select c. first_name, c. last_name , t. brand from customer c
inner join ticket_details t on c. customer_id = t. customer_id where class_id = "Bussiness"  order by customer_id ;
SELECT * FROM Business_classes;
```

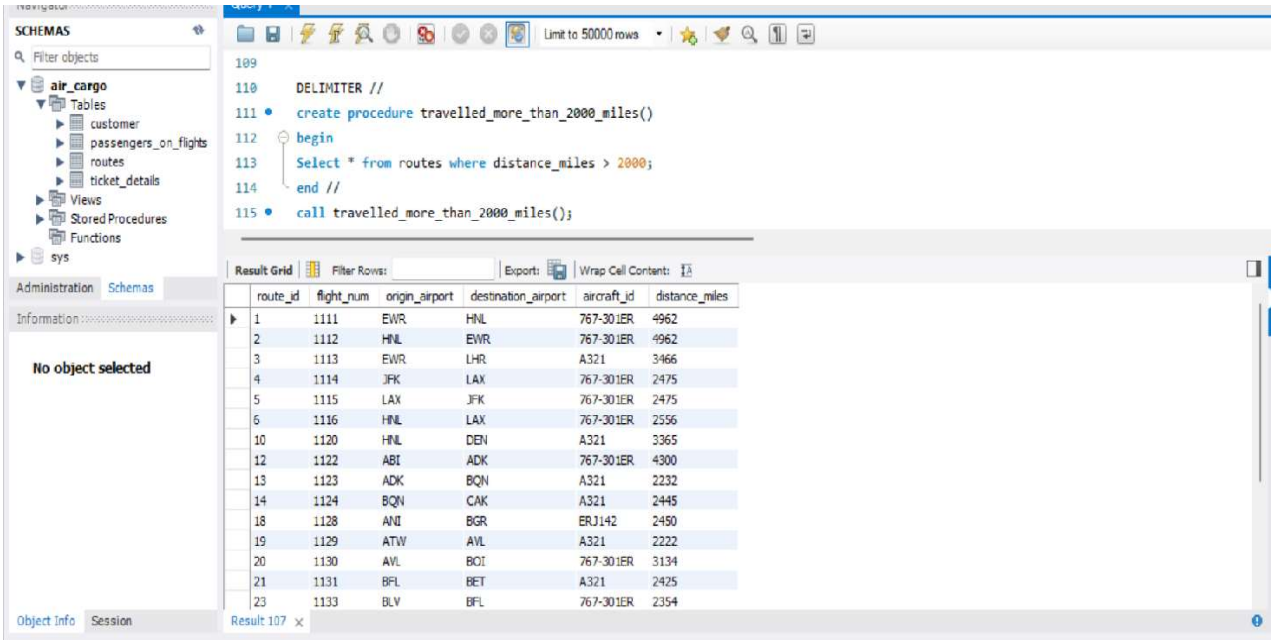
first_name	last_name	brand
Steve	Ryan	Qatar Airways
Aaron	Kim	Emirates
Anderson	Stewart	Emirates
Roger	Walson	Emirates
Roger	Walson	Emirates
Linda	William	Qatar Airways
Chirsty	Josh	Bristish Airways
Calvin	Willis	Qatar Airways
Moss	Morris	Emirates
Watson	Ronald	Jet Airways
Watson	Ronald	Qatar Airways
Mark	Ethan	Bristish Airways
Russell	Peter	Emirates

16)Write a query to create a stored procedure to get the details of all passengers flying between a range of routes defined in run time. Also, return an error message if the table doesn't exist.

```
delimiter $$
create procedure check_routes(in rid VARCHAR (255))
begin
  declare TableNotFound condition for 1146;
declare exit handler for TableNotFound
select 'Please check if table customer / route_id are created - one/both are are missing' Message;
set @query = concat('select * from customer where customer_id in (select distinct customer_id from passengers_on_flights
where route_id in (', rid,'));');
prepare sql_query from @query;
execute sql_query;
end$$
delimiter ;
call check_routes("1,5");
```

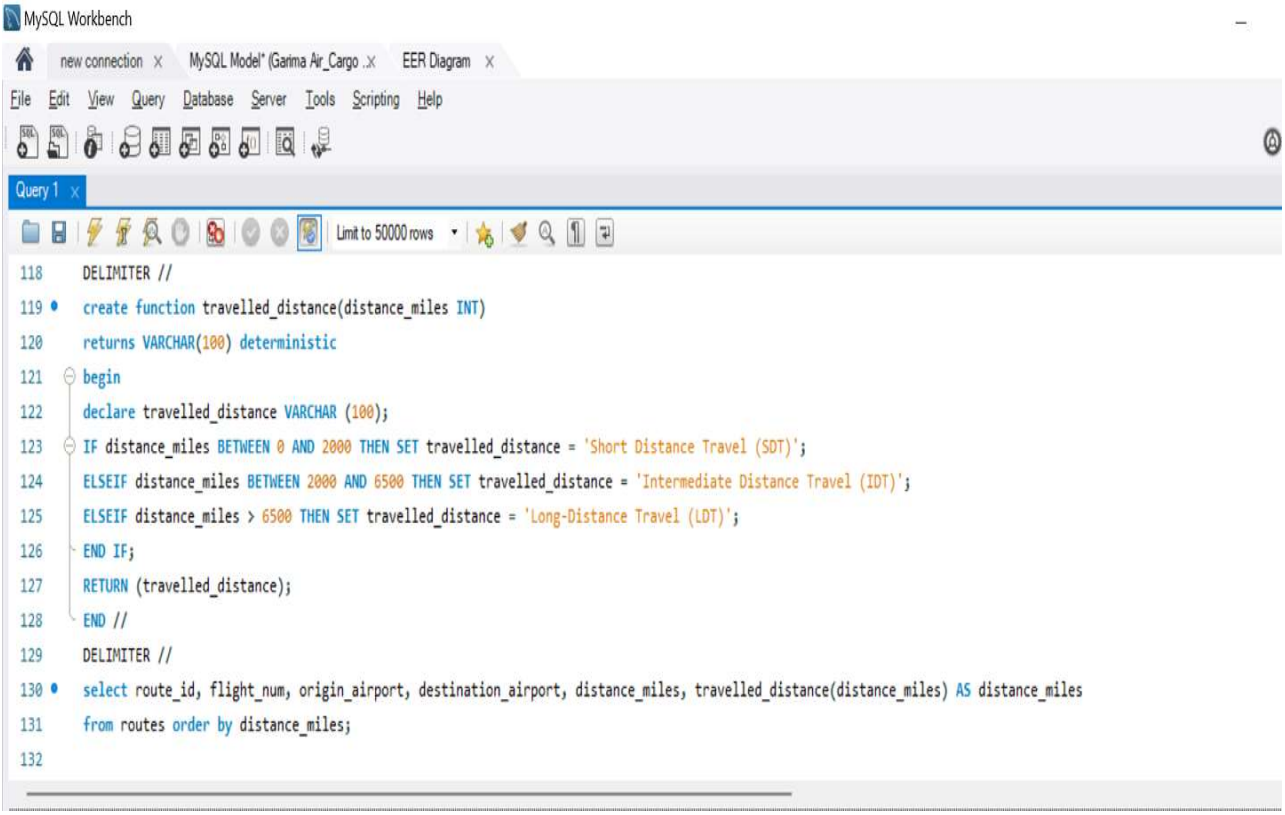
customer_id	first_name	last_name	date_of_birth	gender
4	Cathenna	Emily	14-09-1977	F
11	Roger	Walson	24-05-1996	M
18	Gloria	Richie	04-12-1989	F

17)Write a query to create a stored procedure that extracts all the details from the routes table where the travelled distance is more than 2000 miles.



route_id	flight_num	origin_airport	destination_airport	aircraft_id	distance_miles
1	1111	EWR	HNL	767-301ER	4962
2	1112	HNL	EWR	767-301ER	4962
3	1113	EWR	LHR	A321	3466
4	1114	JFK	LAX	767-301ER	2475
5	1115	LAX	JFK	767-301ER	2475
6	1116	HNL	LAX	767-301ER	2556
10	1120	HNL	DEN	A321	3365
12	1122	ABI	ADK	767-301ER	4300
13	1123	ADK	BQN	A321	2232
14	1124	BQN	CAK	A321	2445
18	1128	ANI	BGR	ERJ142	2450
19	1129	ATW	AVL	A321	2222
20	1130	AVL	BOI	767-301ER	3134
21	1131	BFL	BET	A321	2425
23	1133	BLV	BFL	767-301ER	2354

18)Write a query to create a stored procedure that groups the distance travelled by each flight into three categories. The categories are, short distance travel (SDT) for >=0 AND <= 2000 miles, intermediate distance travel (IDT) for >2000 AND <=6500, and long-distance travel (LDT) for >6500.



Result Grid | Filter Rows: | Export: | Wrap Cell Content:

route_id	flight_num	origin_airport	destination_airport	distance_miles	distance_miles
1	1111	EWR	HNL	4962	Intermediate Distance Travel (IDT)
2	1112	HNL	EWR	4962	Intermediate Distance Travel (IDT)
3	1113	EWR	LHR	3466	Intermediate Distance Travel (IDT)
4	1114	JFK	LAX	2475	Intermediate Distance Travel (IDT)
5	1115	LAX	JFK	2475	Intermediate Distance Travel (IDT)
6	1116	HNL	LAX	2556	Intermediate Distance Travel (IDT)
14	1124	BQN	CAK	2445	Intermediate Distance Travel (IDT)
23	1133	BLV	BFL	2354	Intermediate Distance Travel (IDT)
34	1144	CRW	COD	2452	Intermediate Distance Travel (IDT)
10	1120	HNL	DEN	3365	Intermediate Distance Travel (IDT)
12	1122	ABI	ADK	4300	Intermediate Distance Travel (IDT)
13	1123	ADK	BQN	2232	Intermediate Distance Travel (IDT)
25	1135	RDM	BJI	2425	Intermediate Distance Travel (IDT)
49	1159	DEC	ABI	4533	Intermediate Distance Travel (IDT)
48	1158	SCC	DEN	5645	Intermediate Distance Travel (IDT)
50	1160	DRT	ORD	2445	Intermediate Distance Travel (IDT)
18	1128	ANI	BGR	2450	Intermediate Distance Travel (IDT)

Result 112

19)Write a query to extract ticket purchase date, customer ID, class ID and specify if the complimentary services are provided for the specific class using a stored function in stored procedure on the ticket_details table.

Condition:

- If the class is *Business* and *Economy Plus,* then complimentary services are given as *Yes,* else it is *No*

SCHEMAS

Filter objects

air_cargo
- Tables
  - customer
  - passengers_on_flights
  - routes
  - ticket_details
- Views
- Stored Procedures
- Functions

sys

Administration | Schemas

Information

No object selected

Object Info | Session

Limit to 50000 rows

```
select p_date, customer_id, class_id,
case when class_id in ('Business', 'Economy Plus') then 'Yes'
else "No"
end as complimentary_service from ticket_details;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

p_date	customer_id	class_id	complimentary_service
26-12-2018	27	Economy	No
02-02-2020	22	Economy Plus	Yes
03-03-2020	21	Bussiness	No
04-04-2020	4	First Class	No
05-05-2020	5	Economy	No
07-07-2020	7	Bussiness	No
08-08-2020	8	Economy Plus	Yes
09-09-2020	9	First Class	No
10-10-2020	10	Economy	No
11-11-2020	11	Bussiness	No
12-12-2020	19	Economy Plus	Yes
01-01-2019	13	First Class	No
02-02-2019	14	Economy	No
03-03-2019	25	Bussiness	No

Result 113

Result Grid | Form Editor | Field Types | Query Stats

Read Only

Query Completed

20°C AQI 142 | Search | ENG IN | 02:43 07-12-2022

MySQL Workbench

new connection | MySQL Model* (Garima Air_Cargo ..x | EER Diagram

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Query 1

Limit to 50000 rows

```
140 • create function chk_comp_ser(cls varchar(20))
141   returns char(3)
142   deterministic
143   begin
144   declare comp_ser CHAR(3);
145       if cls in('Bussiness', 'Economy Plus') THEN set comp_ser = 'Yes';
146       else set comp_ser = 'No';
147       end if;
148       return (comp_ser);
149   end $$
150 • create procedure chk_comp_ser_pro()
151   begin
152   select p_date, customer_id, class_id, chk_comp_ser(class_id) as complimentary_service from ticket_details;
153    end $$
154 • call chk_comp_ser_pro();
```

MySQL Workbench

new connection | MySQL Model* (Garima Air_Cargo ..x | EER Diagram

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHEMAS

Filter objects

- air_cargo
  - Tables
    - customer
    - passengers_on_flights
    - routes
    - ticket_details
  - Views
  - Stored Procedures
  - Functions
- sys

Administration | Schemas

Information

No object selected

Object Info | Session

Query 1

Limit to 50000 rows

```
140 • create function chk_comp_ser(cls varchar(20))
141   returns char(3)
142   deterministic
143   begin
144   declare comp_ser CHAR(3);
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

p_date	customer_id	class_id	complimentary_service
26-12-2018	27	Economy	No
02-02-2020	22	Economy Plus	Yes
03-03-2020	21	Bussiness	Yes
04-04-2020	4	First Class	No
05-05-2020	5	Economy	No
07-07-2020	7	Bussiness	Yes
08-08-2020	8	Economy Plus	Yes
09-09-2020	9	First Class	No
10-10-2020	10	Economy	No
11-11-2020	11	Bussiness	Yes
12-12-2020	19	Economy Plus	Yes
01-01-2019	13	First Class	No
02-02-2019	14	Economy	No
03-03-2019	25	Bussiness	Yes
04-04-2019	16	First Class	No
03-05-2019	17	Economy Plus	Yes
06-06-2019	18	Economy	No

Result 114

20)Write a query to extract the first record of the customer whose last name ends with Scott using a cursor from the customer table.