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PROGRAM 5: AIRLINE FLIGHT DATABASE

Consider the following database that keeps track of airline flight information:

FLIGHTS(fno: integer, from: string, to: string, distance: integer, departs: time, arrives: time, price: integer)

AIRCRAFT(aid: integer, aname: string, cruisingrange: integer)

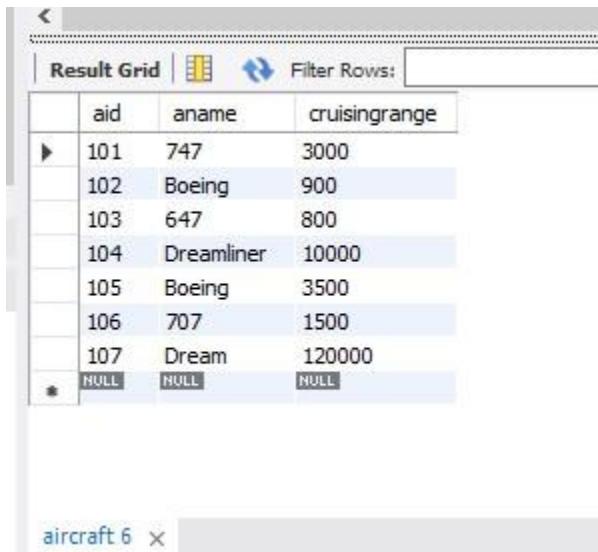
CERTIFIED(eid: integer, aid: integer)

EMPLOYEES(eid: integer, ename: string, salary: integer)

Note that the Employees relation describes pilots and other kinds of employees as well; Every pilot is certified for some aircraft, and only pilots are certified to fly.

Write each of the following queries in SQL.

select * from aircraft;



The screenshot shows a database interface with a 'Result Grid' tab selected. It displays the results of the SQL query 'select * from aircraft;'. The grid has four columns: 'aid', 'aname', and 'cruisingrange'. There are eight rows of data, with the last row containing three NULL values. A status bar at the bottom indicates 'aircraft 6' with a close button.

| | aid | aname | cruisingrange |
|---|------|------------|---------------|
| ▶ | 101 | 747 | 3000 |
| | 102 | Boeing | 900 |
| | 103 | 647 | 800 |
| | 104 | Dreamliner | 10000 |
| | 105 | Boeing | 3500 |
| | 106 | 707 | 1500 |
| | 107 | Dream | 120000 |
| * | NULL | NULL | NULL |

aircraft 6 ×

select * from flights;

| | fno | fromplace | toplace | distance | departs | arrives | price |
|---|------|-----------|-----------|----------|---------------------|---------------------|-------|
| ▶ | 101 | Banglore | Delhi | 2500 | 2005-05-13 07:15:31 | 2005-05-13 07:15:31 | 5000 |
| | 102 | Banglore | Lucknow | 3000 | 2005-05-13 07:15:31 | 2005-05-13 11:15:31 | 6000 |
| | 103 | Lucknow | Delhi | 500 | 2005-05-13 12:15:31 | 2005-05-13 17:15:31 | 3000 |
| | 104 | Banglore | Frankfrut | 8500 | 2005-05-13 07:15:31 | 2005-05-13 23:15:31 | 75000 |
| | 105 | Kolkata | Delhi | 3400 | 2005-05-13 07:15:31 | 2005-05-13 09:15:31 | 7000 |
| | 107 | Banglore | Frankfrut | 8000 | 2005-05-13 07:15:31 | 2005-05-13 22:15:31 | 60000 |
| * | NULL | NULL | NULL | NULL | NULL | NULL | NULL |

select * from employees;

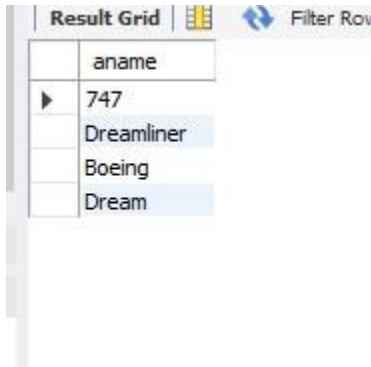
| | eid | ename | salary |
|---|------|-------|--------|
| ▶ | 701 | A | 50000 |
| | 702 | B | 100000 |
| | 703 | C | 150000 |
| | 704 | D | 90000 |
| | 705 | E | 40000 |
| | 706 | F | 60000 |
| | 707 | G | 90000 |
| * | NULL | NULL | NULL |

select * from certified;

| Result Grid | | Filter Rows: |
|---------------|-----|--------------|
| | eid | aid |
| ▶ | 701 | 101 |
| | 701 | 102 |
| | 701 | 106 |
| | 701 | 105 |
| | 702 | 104 |
| | 703 | 104 |
| | 704 | 104 |
| | 702 | 107 |
| | 703 | 107 |
| | 704 | 107 |
| | 702 | 101 |
| | 703 | 105 |
| | 704 | 105 |
| | 705 | 103 |
| certified 9 × | | |

Find the names of aircraft such that all pilots certified to operate them have salaries more than Rs.80,000

```
select distinct A.aname from aircraft A where A.aid in (select C.aid from certified C,Employees E where C.eid=E.eid and not exists (select * from employees E1 where E1.eid=E.eid and E1.salary<80000));
```

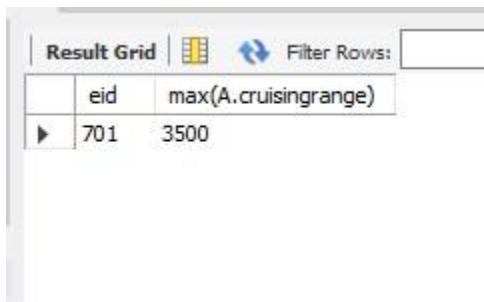


The screenshot shows a 'Result Grid' window with a 'Filter Rows' button. The grid contains a single column labeled 'aname' with the following rows: 747, Dreamliner, Boeing, and Dream.

| aname |
|------------|
| 747 |
| Dreamliner |
| Boeing |
| Dream |

For each pilot who is certified for more than three aircraft, find the eid and the maximum cruisingrange of the aircraft for which she or he is certified.

```
select C.eid ,max(A.cruisingrange) from certified C,aircraft A where C.aid=A.aid group by C.eid having count(*)>3;
```

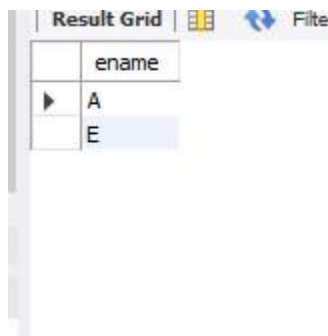


The screenshot shows a 'Result Grid' window with a 'Filter Rows' button. The grid contains two columns: 'eid' and 'max(A.cruisingrange)'. The first row shows the value 701 for 'eid' and 3500 for 'max(A.cruisingrange)'.

| eid | max(A.cruisingrange) |
|-----|----------------------|
| 701 | 3500 |

Find the names of pilots whose salary is less than the price of the cheapest route from Bengaluru to Frankfurt.

```
select distinct E.ename from employees E where E.salary <(select min(F.price) from flights F where F.fromplace="Bangalore" and F.toplace="Frankfrut");
```

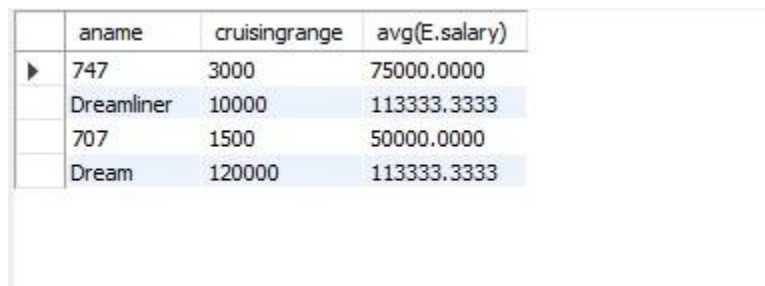


The screenshot shows a 'Result Grid' window with a table containing two rows of pilot names. The first row is 'A' and the second row is 'E'. The window has a 'Filter' button and a 'Result Grid' tab.

| ename |
|-------|
| A |
| E |

For all aircraft with cruisingrange over 1000 Kms, find the name of the aircraft and the average salary of all pilots certified for this aircraft.

```
select A.aname,A.cruisingrange,avg(E.salary) from aircraft A,employees E,Certified C where C.eid=E.eid and C.aid=A.aid group by A.aname having A.cruisingrange>1000;
```



The screenshot shows a 'Result Grid' window with a table containing four rows of aircraft data. The columns are 'aname', 'cruisingrange', and 'avg(E.salary)'. The rows are: 747 (3000, 75000.0000), Dreamliner (10000, 113333.3333), 707 (1500, 50000.0000), and Dream (120000, 113333.3333). The window has a 'Filter' button and a 'Result Grid' tab.

| aname | cruisingrange | avg(E.salary) |
|------------|---------------|---------------|
| 747 | 3000 | 75000.0000 |
| Dreamliner | 10000 | 113333.3333 |
| 707 | 1500 | 50000.0000 |
| Dream | 120000 | 113333.3333 |

Find the names of pilots certified for some Boeing aircraft.

```
select distinct E.ename from employees E,certified C,aircraft A where E.eid = C.eid and C.aid =A .aid and A.aname LIKE "Boeing";
```

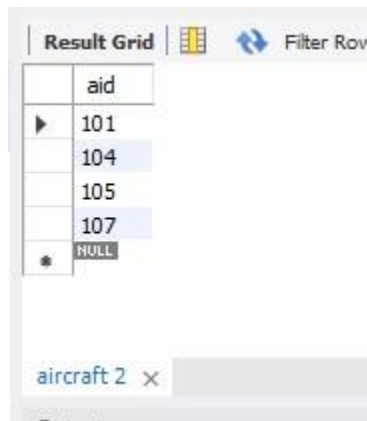


The screenshot shows a 'Result Grid' window with a table containing three rows of pilot names. The first row is 'A', the second row is 'C', and the third row is 'D'. The window has a 'Filter' button and a 'Result Grid' tab. Below the table, there is a 'Result 1' tab.

| ename |
|-------|
| A |
| C |
| D |

Find the aids of all aircraft that can be used on routes from Bengaluru to New Delhi

**select A.aid from aircraft A where A.cruisingrange > (select min(F.distance) from flights F
where F.fromplace = "Banglore" and F.toplace = "Delhi");**



The screenshot shows a database query result grid. The grid has a single column labeled 'aid'. The rows contain the values 101, 104, 105, 107, and NULL. The row with 104 is highlighted. Below the grid, there is a tab labeled 'aircraft 2' with a close button (X).

| aid |
|------|
| 101 |
| 104 |
| 105 |
| 107 |
| NULL |