Database Final Project: Airline System

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Highlights

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Security Concern	Use md5() to encode password in database			
Additional View	Use views on top agent/top customers to prevent repeat query request			
Procedures and Triggers	Procedures to get staff airline instead of queries, triggers on insert constraint			
User-friendly API	Clear search bar, pie/bar-chart, login/register forms			
Extra Functionality	Agent can request limited information from customers they served before			
Optimized SQL Queries	Optimization on join, select and indexing			





l. Use Join On instead of Cartesian Product

```
/FlightSearch
# enter departure airport and arrival city
```

```
SELECT airline_name, flight_num, departure_airport, arrival_airport, departure_time, arrival_time, price, status

FROM airport AS a, flight AS b

WHERE a.airport_name = b.arrival_airport

AND b.departure_airport = 'NRT'

AND a.airport_city = 'Shanghai'

AND departure time LIKE '2000-12-13%'
```

```
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```

SELECT airline_name, flight_num, departure_airport, arrival_airport, departure_time, arrival_time, price, status FROM airport AS a, flight AS b
WHERE a.airport_name = b.arrival_airport AND b.departure_airport = 'NRT' AND a.airport_city = 'Shanghai' AND departure_time LIKE '2000-12-13%';

l. Use Join On instead of Cartesian Product

```
# enter departure airport and arrival city

SELECT airline_name, flight_num, departure_airport, arrival_airport, departure_time, arrival_time, price, status

FROM flight_AS b_JOIN_airport_AS a
```

```
On (a.airport_name = b.arrival_airport)
WHERE
b.departure_airport = 'NRT'
AND a.airport_city = 'Shanghai'
```

/FlightSearch

AND departure time LIKE '2000-12-13%'



```
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SELECT airline_name, flight_num, departure_airport, arrival_airport, departure_time, arrival_time, price, status FROM flight AS b JOIN airport AS a on (a.airport_name = b.arrival_airport) WHERE b.departure_airport = 'NRT' AND a.airport_city = 'Shanghai' AND departure_time LIKE '2000-12-13%';
```

2. Use Small Table as Outer Table During JOIN

```
/FlightSearch
# enter departure airport and arrival city
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```
SELECT airline_name, flight_num, departure_airport, arrival_airport, departure_time, arrival_time, price, status

FROM airport AS a JOIN flight AS b

on (a.airport_name = b.arrival_airport)

WHERE

b.departure_airport = 'NRT'

AND a.airport_city = 'Shanghai'

AND departure_time LIKE '2000-12-13%'
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SELECT airline_name, flight_num, departure_airport, arrival_airport, departure_time, arrival_time, price, status FROM airport AS a JOIN flight AS b on (a.airport_name = b.arrival_airport) WHERE b.departure_airport = 'NRT' AND a.airport_city = 'Shanghai' AND departure_time LIKE '2000-12-13%';

3. Remove Filtering from Group By

/StaffComparison

Get direct sales in one year

SELECT IFNULL(sum(price),0) as direct_sum from purchases NATURAL JOIN ticket NATURAL JOIN flight

WHERE airline_name = 'All Nippon Airways' and purchase_date BETWEEN '2000-01-01' and '2024-01-01'

GROUP BY booking agent id

HAVING booking agent id is Null

Original

✓ MySQL 返回的查询结果为空(即零行)。(查询花费 0.0010 秒。)

SELECT IFNULL(sum(price),0) as direct_sum from purchases NATURAL JOIN ticket NATURAL JOIN flight WHERE airline_name = 'All Nippon Airways' and purchase_date BETWEEN '2000-01-01' and '2024-01-01' GROUP BY booking_agent_id HAVING booking_agent_id is Null;

3. Remove Filtering from Group By

/StaffComparison

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WHERE airline name = 'All Nippon Airways' and purchase_date BETWEEN '2000-01-01' and '2024-01-01'

and booking agent id is Null

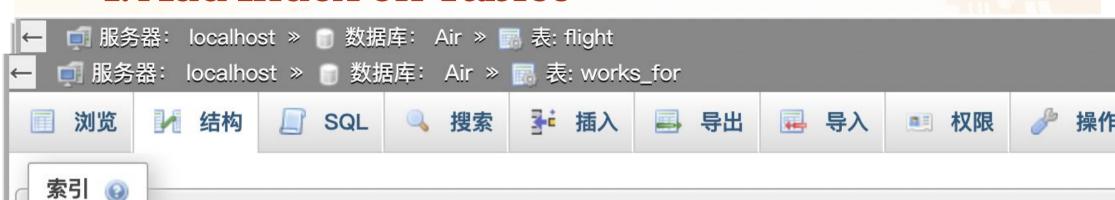
GROUP BY booking agent id



✓ MySQL 返回的查询结果为空(即零行)。(查询花费 0.0002 秒。)

SELECT IFNULL(sum(price),0) as direct_sum from purchases NATURAL JOIN ticket NATURAL JOIN flight WHERE airline_name = 'All Nippon Airways' and purchase_date BETWEEN '2000-01-01' and '2024-01-01' and booking_agent_id is Null GROUP BY booking_agent_id;

4. Add Index on Tables





4. Add Index on Tables

Use Explain to see whether the index is actually being used....

您的 SQL 语句已成功运行。

EXPLAIN SELECT IFNULL(sum(price),0) as direct_sum from purchases NATURAL JOIN ticket NATURAL JOIN flight WHERE airline_name = 'All Nippon Airways' and purchase_date BETWEEN '2000-01-01' and '2024-01-01' and booking_agent_id is not Null GROUP BY booking_agent_id;

[编辑内嵌][编辑][略过解析 SQL][分析解释了mariadb.org][创建 PHP 代码]

额外选项

id select_ty	pe table	type	possible_keys	key	key_len	ref	rows	Extra
1 SIMPLE	ticket	ref	PRIMARY,airline_name	airline_name	52	const	2	Using where; Using index; Using temporary; Using f