Database Project: TAME's database state

M. Molina, A. Riofrío, E.Vega, L.Rueda

Yachay Tech University

Friday, 28th of July of 2017

Outline

Conceptual Model

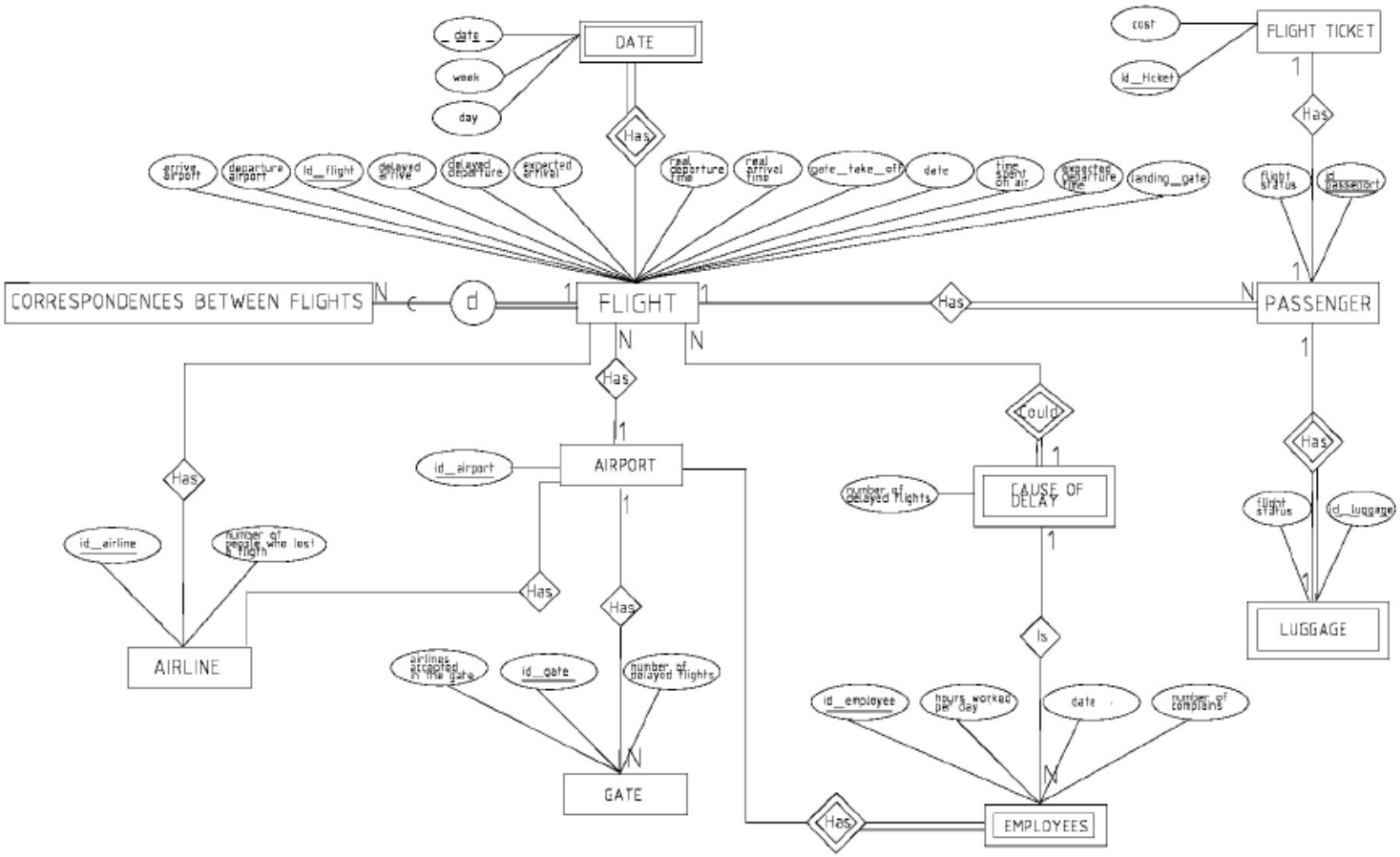

Figure 1: Enty relationship diagram of airline

Tables and dependencies

- **Table FLIGHT**
  Attributes of *FLIGHT*

$$FLIGHT = (\underline{id\_flight},\ landing\_gate,\ gate\_take\_off)$$

  Functional Dependences of *FLIGHT*

$$\{\underline{id\_flight}\} \rightarrow \{landing\_gate,\ gate\_take\_off\}$$

- **Table AIRLINE**
  Attributes of *AIRLINE*

$$AIRLINE = (\underline{id\_airline},\ name)$$

  Functional Dependences of *AIRLINE*

$$\{\underline{id\_airline}\} \rightarrow \{name\}$$

Tables and dependencies

- **Table GATE**
  Attributes of *GATE*

$$GATE = (\underline{id\_gate}, real\_time, expected\_time)$$

  Functional Dependence of *GATE*

$$\{\underline{id\_gate}\} \rightarrow \{real\_time, expected\_time\}$$

- **Table AIRPORT**
  Attributes of *AIRPORT*

$$AIRPORT = (\underline{id\_airport}, name)$$

  Functional Dependence of *AIRPORT*

$$\{\underline{id\_airport}\} \rightarrow \{name\}$$

Conceptual/logical model without normalization

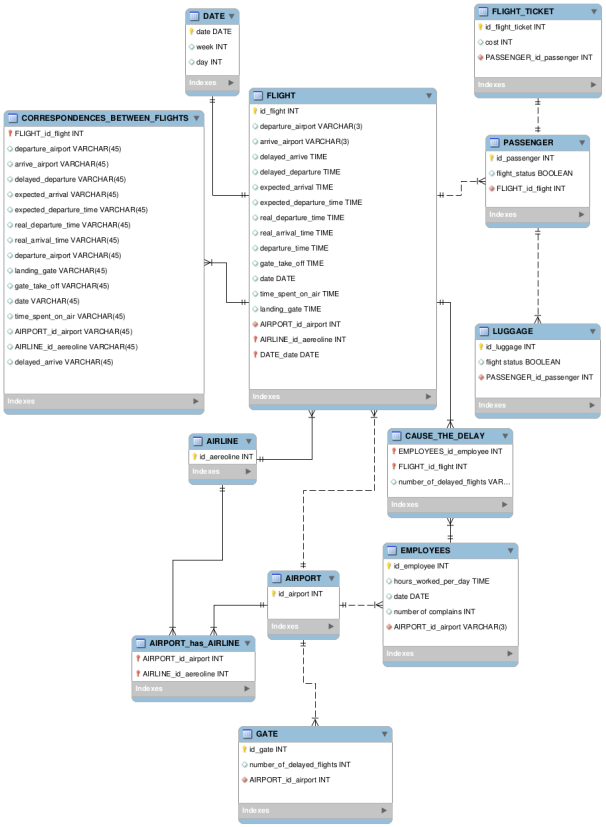

Figure 2: Model without normalization.

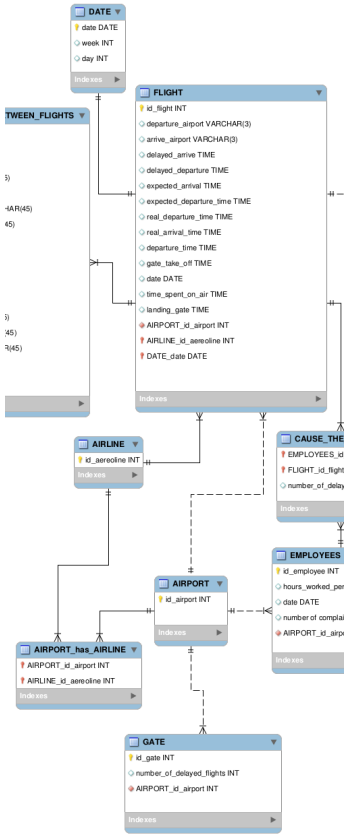

Figure 3: Tables with which we made the query

Conceptual/logical model with normalization

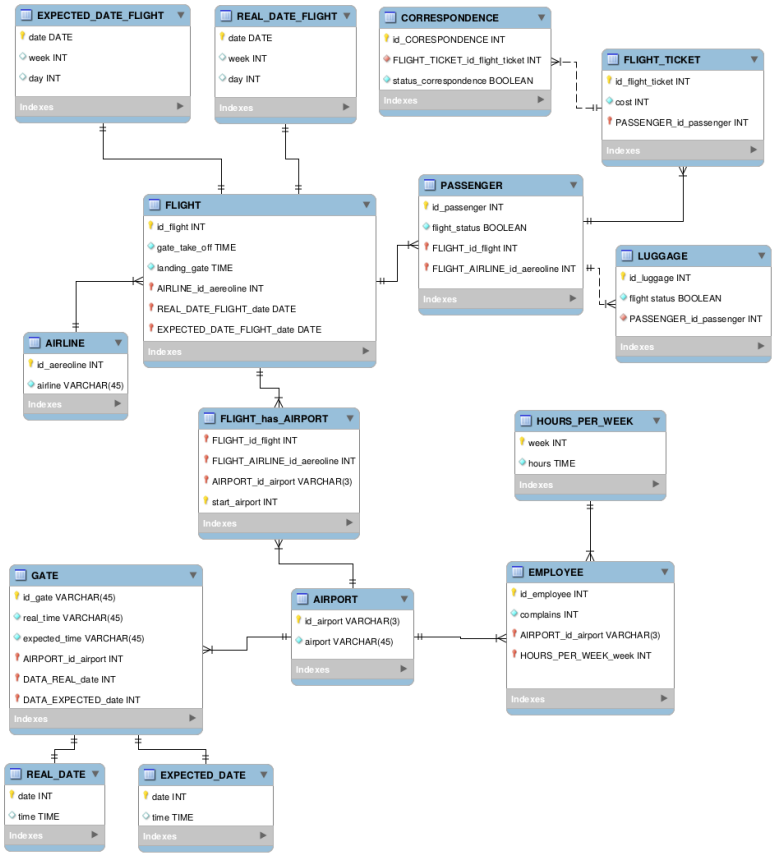

Figure 4: Model with normalization.

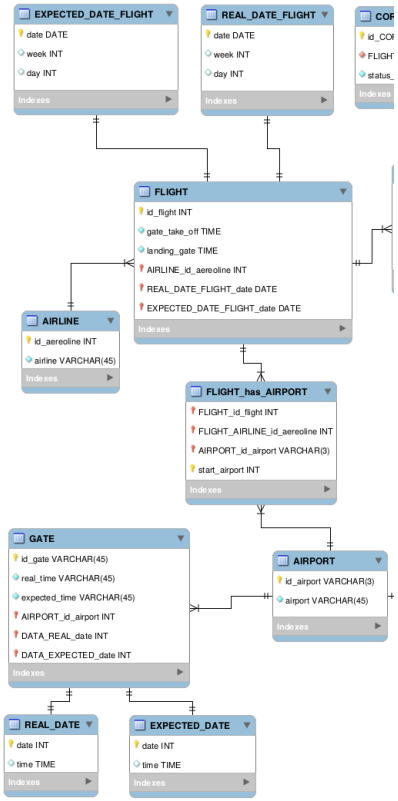

Figure 5: Tables with which we made the query

Database State

Query

Retrieve the start and end airports from every flight of TAME's group

FLIGHT-HAS-AIRPORT

FLIGHT_id_flight	FLIGHT_AIRLINE_id_airline	AIRPORT_id_airport	start_airport
1	100	ABL	1
1	100	ABQ	0
2	104	ABG	1
2	104	ABL	0
3	105	ABT	1
3	105	ABG	0
4	106	ABM	1
4	106	ABI	0
5	107	ABL	1
5	107	ABI	0
6	108	ABQ	1
6	108	ABT	0

Figure 6: Possible database state for FLIGHT HAS AIRPORT table

SQL query

```
SELECT id_Flight, Start_Air, AIRPORT_id_airport AS Final_Air
from FLIGHT_has_AIRPORT,
    (
    SELECT FLIGHT_AIRLINE_id_aereoline AS id_Airline,FLIGHT_id_flight AS id_Flight, AIRPORT_id_airport AS Start_Air
    from FLIGHT_has_AIRPORT
    where start_airport=1
    ) Start_A
where start_airport=0  AND Start_A.id_Airline=FLIGHT_AIRLINE_id_aereoline
```

Figure 7: MySql query.

id_Flight	Start_Air	Final_Air
1	ABL	ABQ
2	ABG	ABL
3	AST	ABG
4	ABM	ABI
5	ABL	ABI
6	ABQ	AST

Figure 8: MySql query.

Optimization of the query with algebra

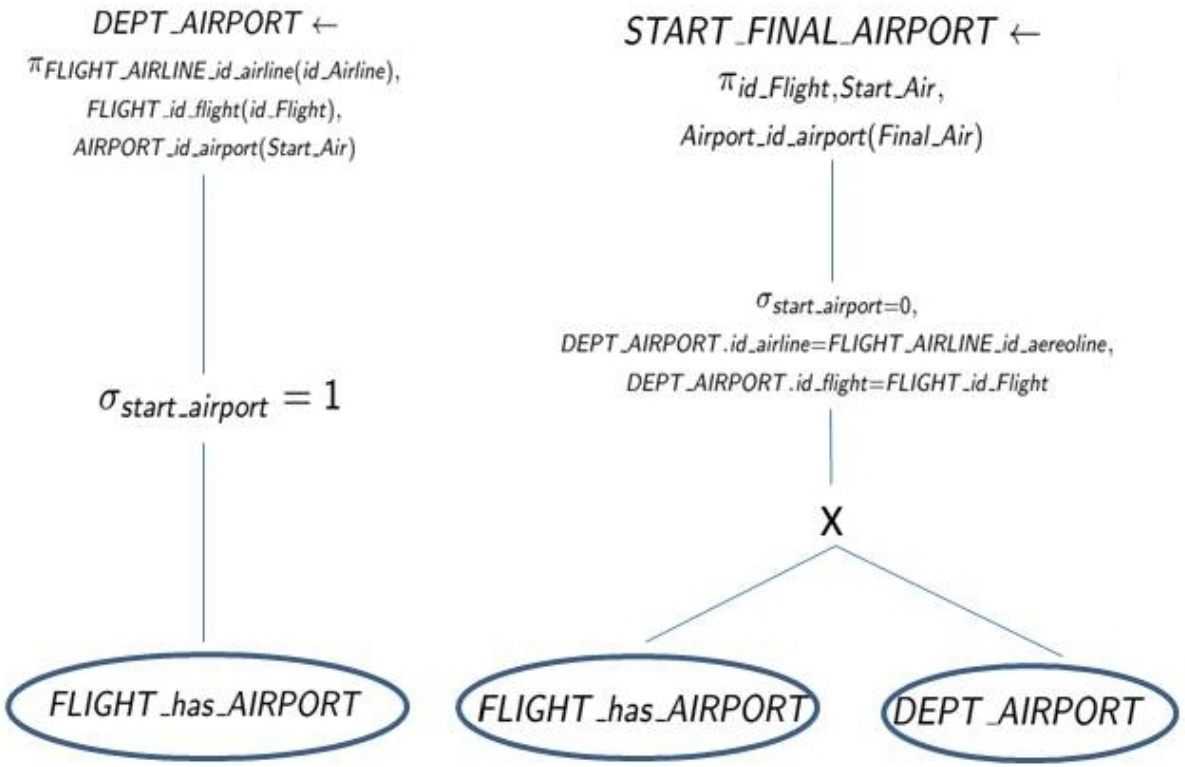

Figure 9: Optimization of start and final airports query.

Optimization of the query with algebra

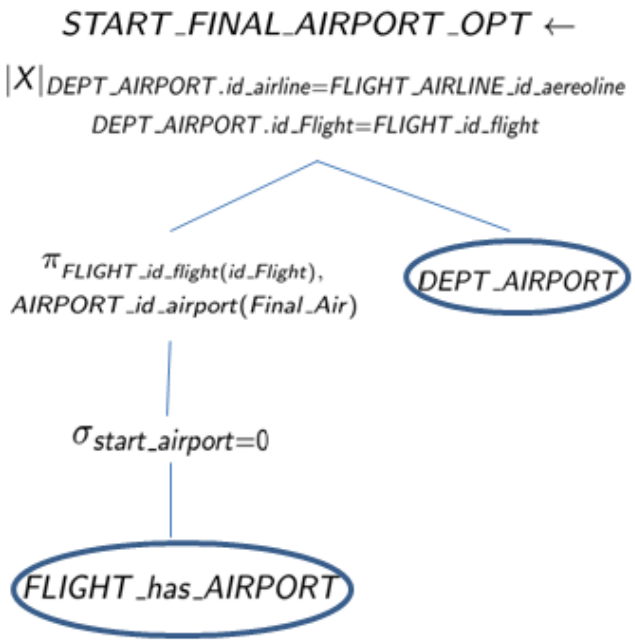

Figure 10: Optimization of start and final airports query.

Optimization of the query in MySql

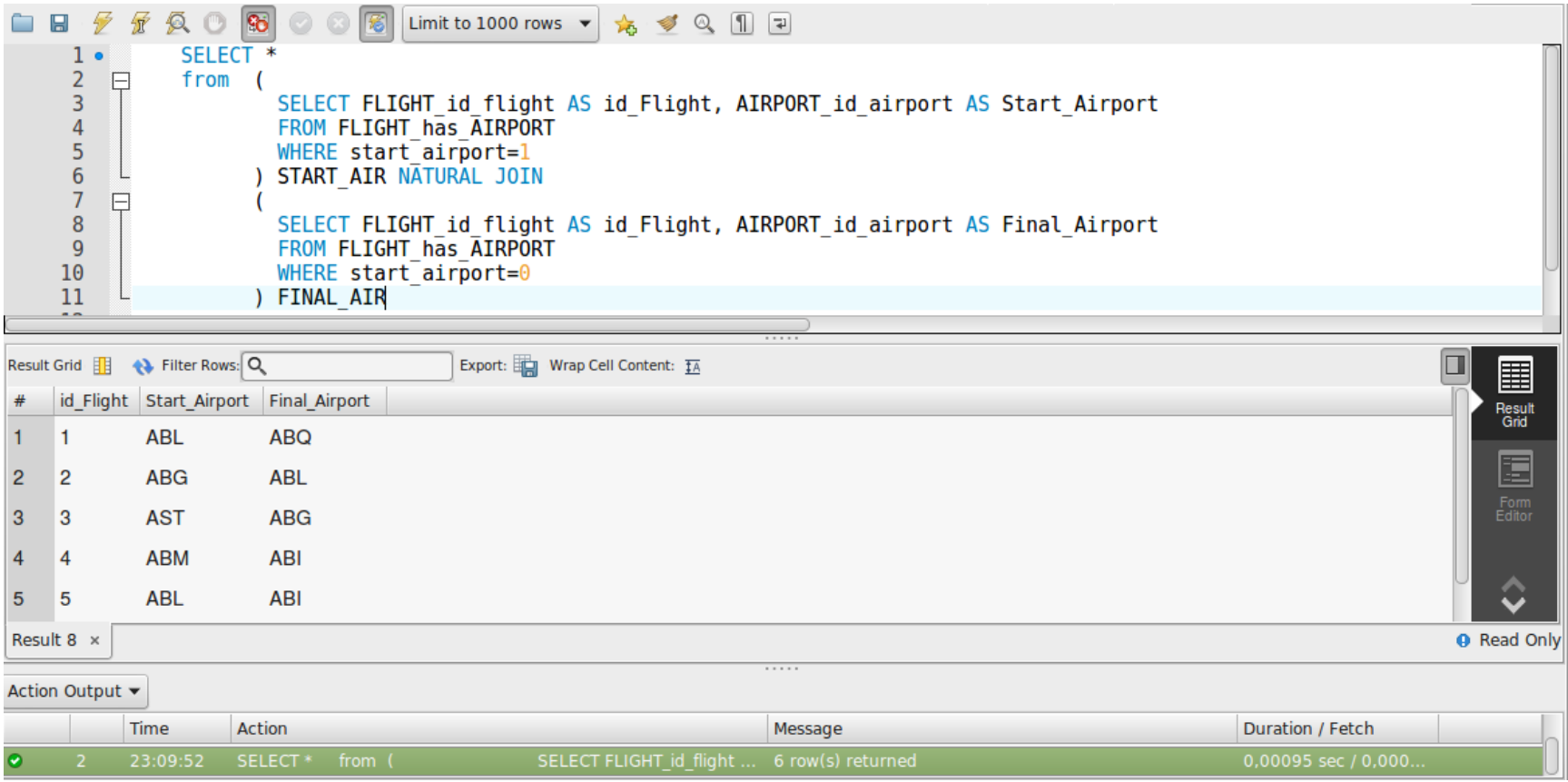

Figure 11: MySql optimization of the start and final airports query.