Project Report

Data Analysis and Integration – 2022/2023

Group: 2

Students: Francisco Ribeiro (95578) and Diogo Lopes (96732)

Index

Data Warehouse SQL

airports_dw.sql

```sql
DROP DATABASE IF EXISTS airports_dw;

CREATE DATABASE airports_dw;

USE airports_dw;


CREATE TABLE dim_airport (
    AIRPORT_ID INT,
    AIRPORT_NAME VARCHAR(255),
    CITY VARCHAR(255),
    COUNTRY VARCHAR(255),
    PRIMARY KEY (AIRPORT_ID)
);

CREATE TABLE dim_departure (
    TIME_ID DATETIME,
    YEAR_ID INT,
    MONTH_ID INT,
    MONTH_NAME VARCHAR(255),
    DAY_ID INT,
    PRIMARY KEY (TIME_ID)
);

CREATE TABLE dim_arrival (
    TIME_ID DATETIME,
    YEAR_ID INT,
    MONTH_ID INT,
    MONTH_NAME VARCHAR(255),
    DAY_ID INT,
    PRIMARY KEY (TIME_ID)
);

CREATE TABLE dim_airplane (
    AIRPLANE_ID INT,
    AIRPLANE_TYPE INT,
    PRIMARY KEY (AIRPLANE_ID)
);

CREATE TABLE dim_airline (
    AIRLINE_ID INT,
    AIRLINE_NAME VARCHAR(255),
    PRIMARY KEY (AIRLINE_ID)
);
```

```
CREATE TABLE fact_flight (
    FLIGHT_ID INT,
    TOTALBOOKINGS INT,
    REVENUE DECIMAL(65,2),
    AIRLINE_ID INT,
    AIRPLANE_ID INT,
    ORIGIN_ID INT,
    DESTINATION_ID INT,
    DEPARTURE DATETIME,
    ARRIVAL DATETIME,
    PRIMARY KEY (FLIGHT_ID),
    FOREIGN KEY (AIRLINE_ID) REFERENCES dim_airline (AIRLINE_ID),
    FOREIGN KEY (AIRPLANE_ID) REFERENCES dim_airplane (AIRPLANE_ID),
    FOREIGN KEY (ORIGIN_ID) REFERENCES dim_airport (AIRPORT_ID),
    FOREIGN KEY (DESTINATION_ID) REFERENCES dim_airport (AIRPORT_ID),
    FOREIGN KEY (DEPARTURE) REFERENCES dim_departure (TIME_ID),
    FOREIGN KEY (ARRIVAL) REFERENCES dim_arrival (TIME_ID)
)
```

Transformations

dim_airline

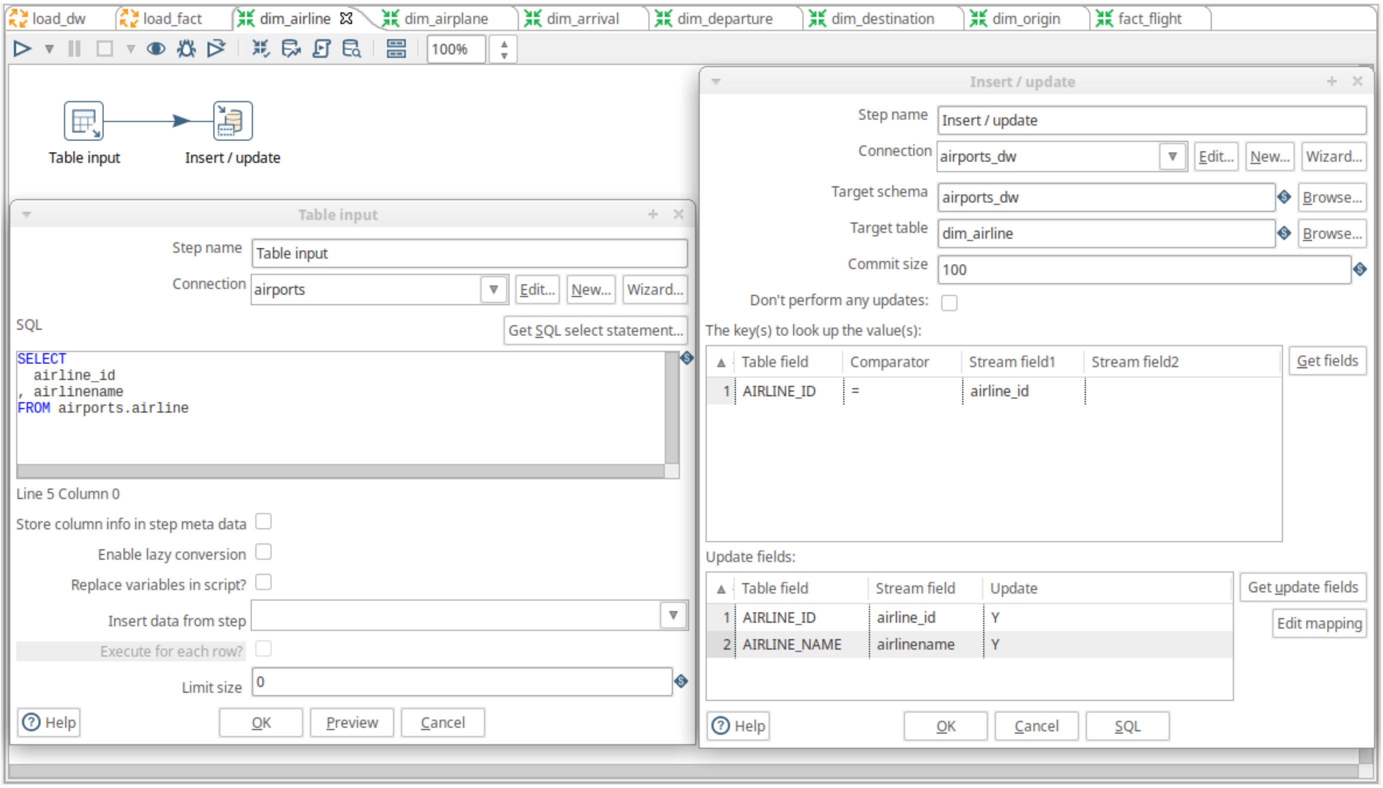


Table input

Step name: Table input

Connection: airports

SQL

```
SELECT
  airline_id
, airlinename
FROM airports.airline
```

Line 5 Column 0

Store column info in step meta data □

Enable lazy conversion □

Replace variables in script? □

Insert data from step:

Execute for each row? □

Limit size: 0

Insert / update

Step name: Insert / update

Connection: airports_dw

Target schema: airports_dw

Target table: dim_airline

Commit size: 100

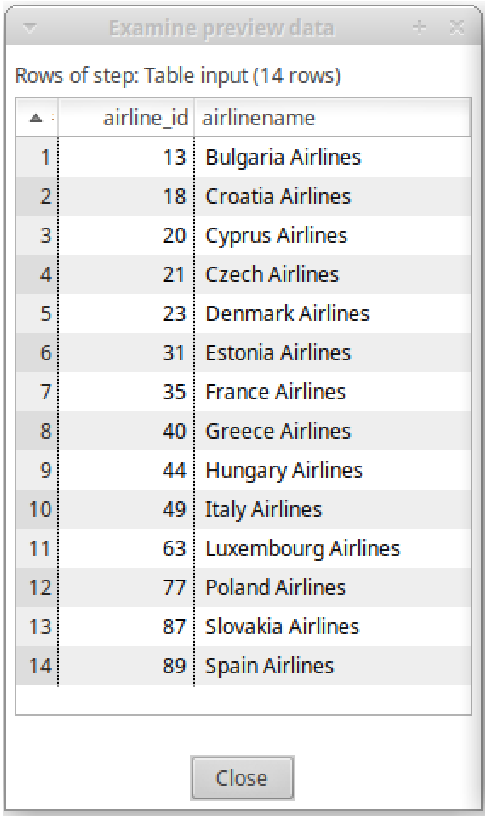
Don't perform any updates: □

The key(s) to look up the value(s):

	Table field	Comparator	Stream field1	Stream field2
1	AIRLINE_ID	=	airline_id	

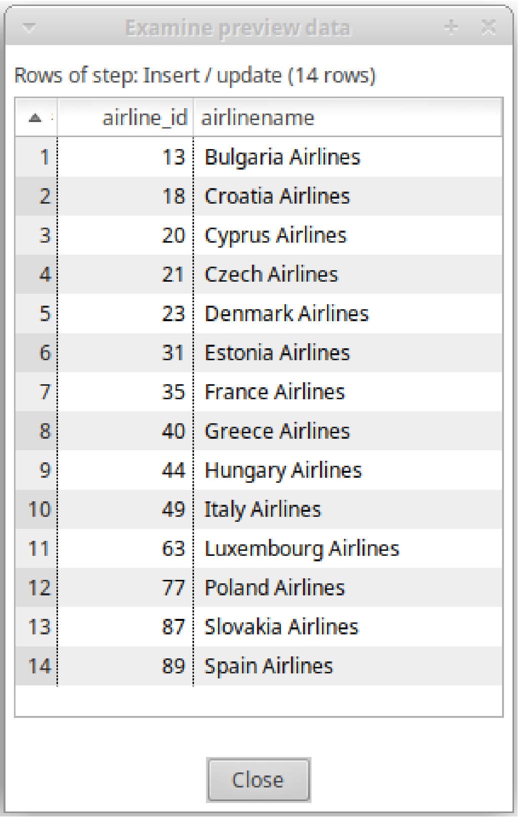
Update fields:

	Table field	Stream field	Update
1	AIRLINE_ID	airline_id	Y
2	AIRLINE_NAME	airlinename	Y


Examine preview data

Rows of step: Table input (14 rows)

	airline_id	airlinename
1	13	Bulgaria Airlines
2	18	Croatia Airlines
3	20	Cyprus Airlines
4	21	Czech Airlines
5	23	Denmark Airlines
6	31	Estonia Airlines
7	35	France Airlines
8	40	Greece Airlines
9	44	Hungary Airlines
10	49	Italy Airlines
11	63	Luxembourg Airlines
12	77	Poland Airlines
13	87	Slovakia Airlines
14	89	Spain Airlines


Examine preview data

Rows of step: Insert / update (14 rows)

	airline_id	airlinename
1	13	Bulgaria Airlines
2	18	Croatia Airlines
3	20	Cyprus Airlines
4	21	Czech Airlines
5	23	Denmark Airlines
6	31	Estonia Airlines
7	35	France Airlines
8	40	Greece Airlines
9	44	Hungary Airlines
10	49	Italy Airlines
11	63	Luxembourg Airlines
12	77	Poland Airlines
13	87	Slovakia Airlines
14	89	Spain Airlines

dim_airplane

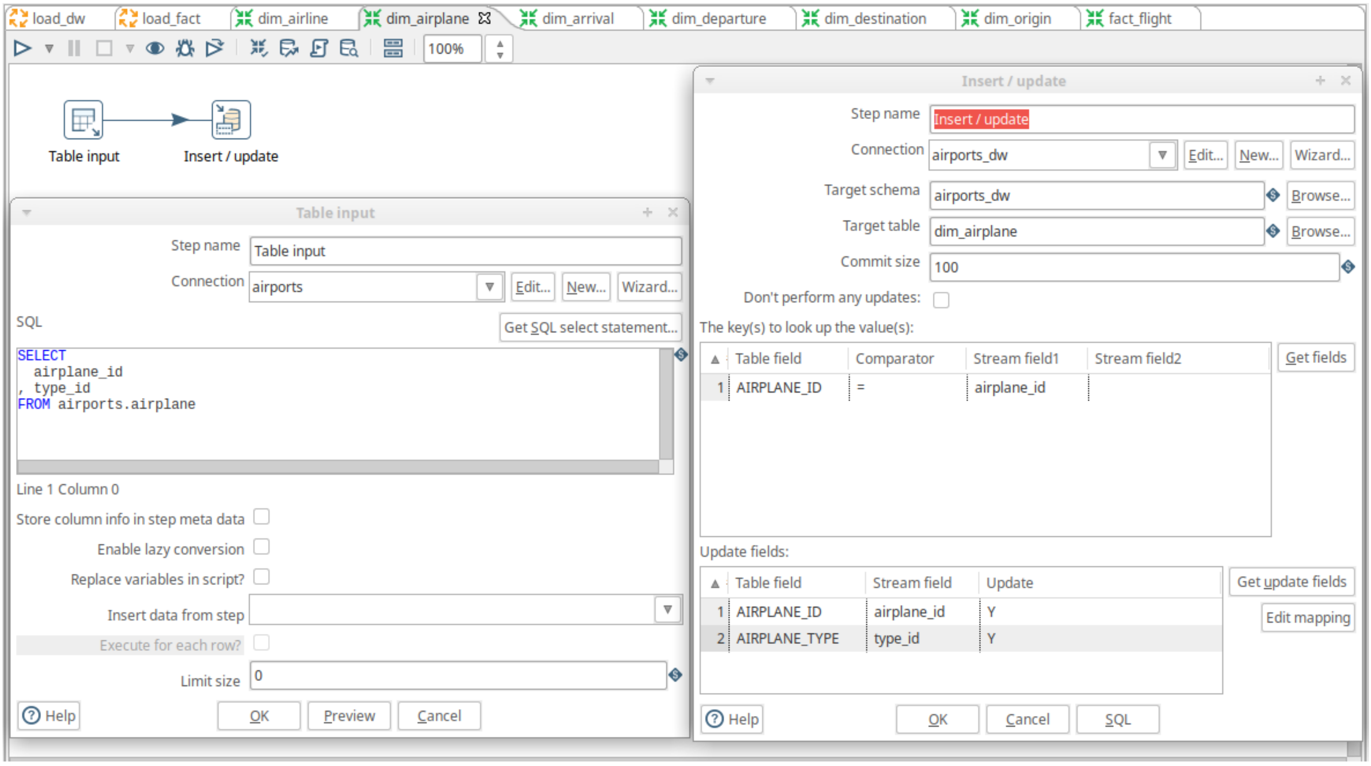


Table input

Step name: Table input

Connection: airports

```
SELECT
  airplane_id
, type_id
FROM airports.airplane
```

Line 1 Column 0

Store column info in step meta data □

Enable lazy conversion □

Replace variables in script? □

Insert data from step:

Execute for each row? □

Limit size: 0

Insert / update

Step name: Insert / update

Connection: airports_dw

Target schema: airports_dw

Target table: dim_airplane

Commit size: 100

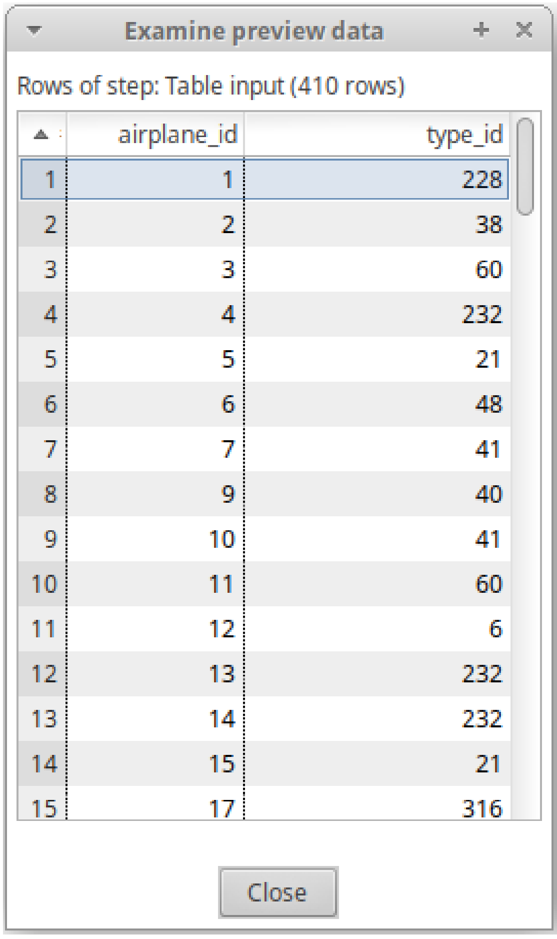
Don't perform any updates: □

The key(s) to look up the value(s):

	Table field	Comparator	Stream field1	Stream field2
1	AIRPLANE_ID	=	airplane_id	

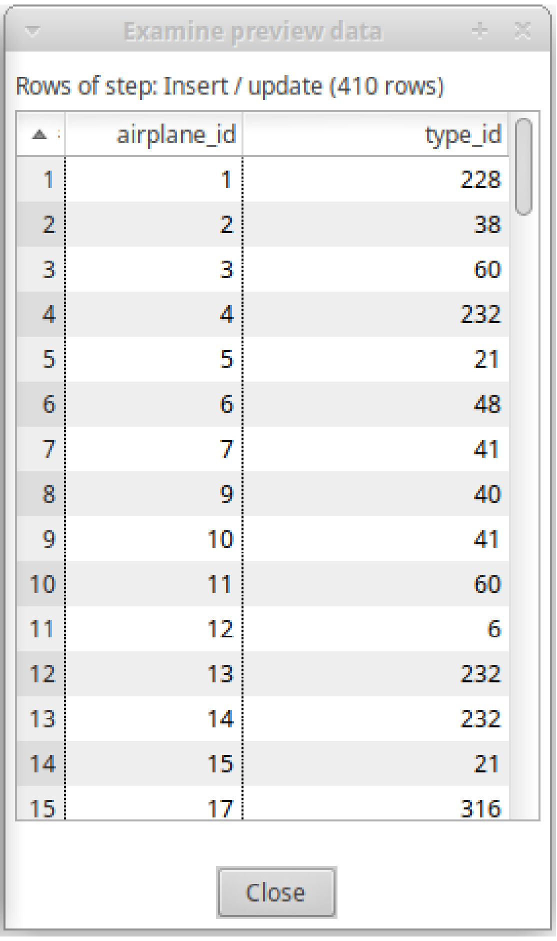
Update fields:

	Table field	Stream field	Update
1	AIRPLANE_ID	airplane_id	Y
2	AIRPLANE_TYPE	type_id	Y



Rows of step: Table input (410 rows)

	airplane_id	type_id
1	1	228
2	2	38
3	3	60
4	4	232
5	5	21
6	6	48
7	7	41
8	9	40
9	10	41
10	11	60
11	12	6
12	13	232
13	14	232
14	15	21
15	17	316



Rows of step: Insert / update (410 rows)

	airplane_id	type_id
1	1	228
2	2	38
3	3	60
4	4	232
5	5	21
6	6	48
7	7	41
8	9	40
9	10	41
10	11	60
11	12	6
12	13	232
13	14	232
14	15	21
15	17	316

dim_arrival

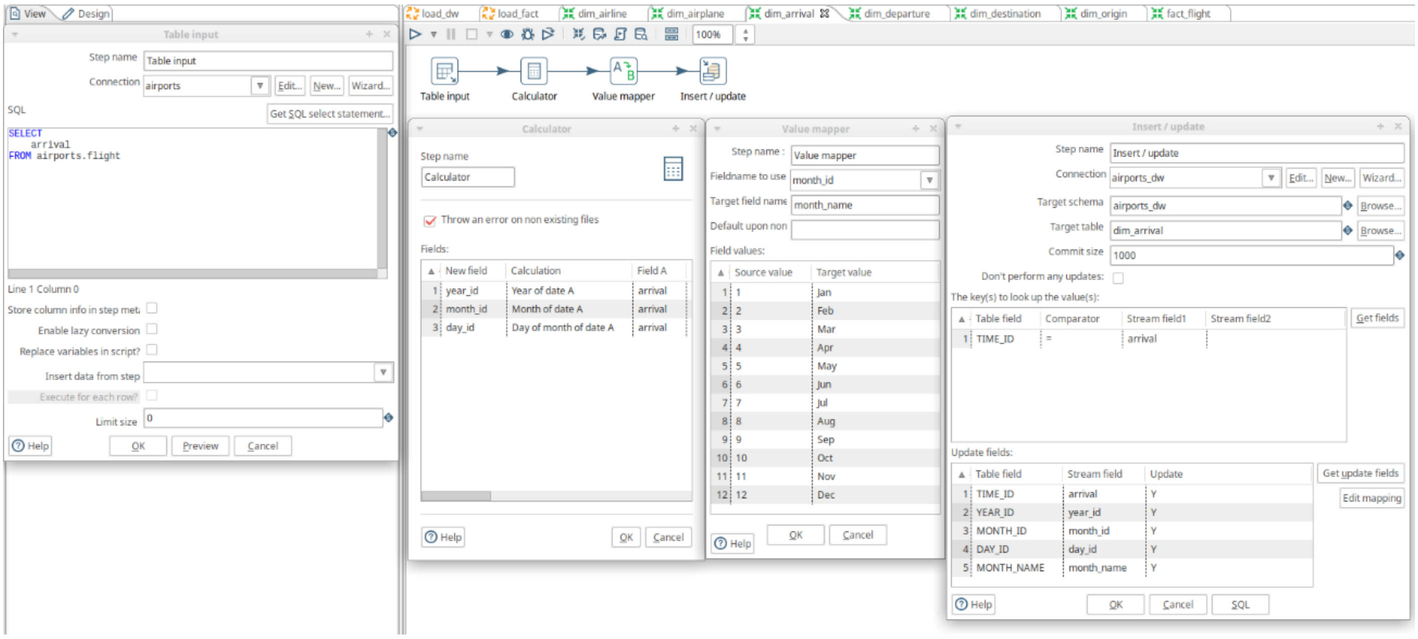


Table input

Step name: Table input

Connection: airports

SQL

```
SELECT
    arrival
FROM airports.flight
```

Line 1 Column 0

Store column info in step meta □

Enable lazy conversion □

Replace variables in script? □

Insert data from step

Execute for each row? □

Limit size: 0

Calculator

Step name: Calculator

☑ Throw an error on non existing files

Fields:

	New field	Calculation	Field A
1	year_id	Year of date A	arrival
2	month_id	Month of date A	arrival
3	day_id	Day of month of date A	arrival

Value mapper

Step name : Value mapper

Fieldname to use: month_id

Target field name: month_name

Default upon non

Field values:

	Source value	Target value
1	1	Jan
2	2	Feb
3	3	Mar
4	4	Apr
5	5	May
6	6	Jun
7	7	Jul
8	8	Aug
9	9	Sep
10	10	Oct
11	11	Nov
12	12	Dec

Insert / update

Step name: Insert / update

Connection: airports_dw

Target schema: airports_dw

Target table: dim_arrival

Commit size: 1000

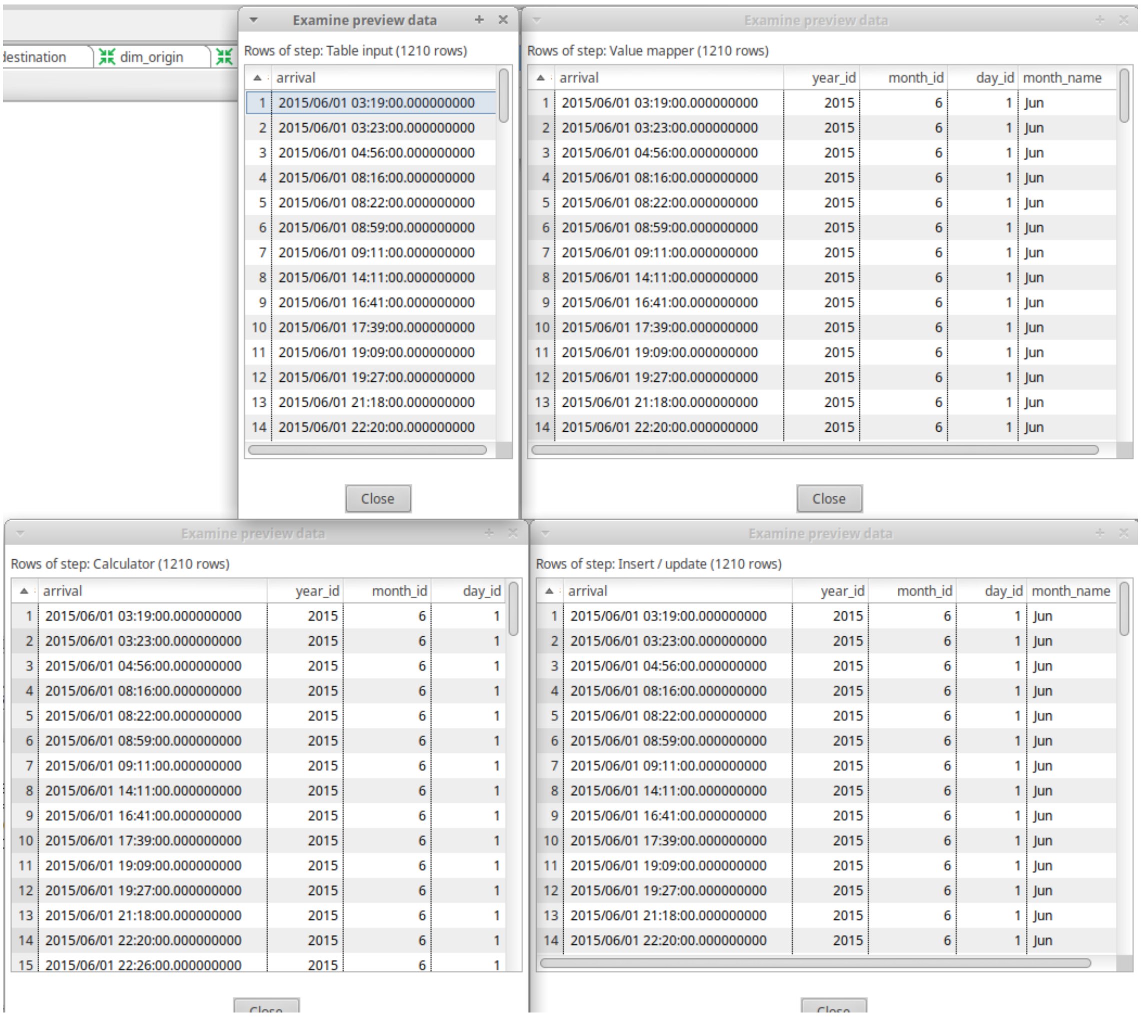
Don't perform any updates: □

The key(s) to look up the value(s):

	Table field	Comparator	Stream field1	Stream field2
1	TIME_ID	=	arrival	

Update fields:

	Table field	Stream field	Update
1	TIME_ID	arrival	Y
2	YEAR_ID	year_id	Y
3	MONTH_ID	month_id	Y
4	DAY_ID	day_id	Y
5	MONTH_NAME	month_name	Y



Rows of step: Table input (1210 rows)

	arrival
1	2015/06/01 03:19:00.000000000
2	2015/06/01 03:23:00.000000000
3	2015/06/01 04:56:00.000000000
4	2015/06/01 08:16:00.000000000
5	2015/06/01 08:22:00.000000000
6	2015/06/01 08:59:00.000000000
7	2015/06/01 09:11:00.000000000
8	2015/06/01 14:11:00.000000000
9	2015/06/01 16:41:00.000000000
10	2015/06/01 17:39:00.000000000
11	2015/06/01 19:09:00.000000000
12	2015/06/01 19:27:00.000000000
13	2015/06/01 21:18:00.000000000
14	2015/06/01 22:20:00.000000000

Rows of step: Value mapper (1210 rows)

	arrival	year_id	month_id	day_id	month_name
1	2015/06/01 03:19:00.000000000	2015	6	1	Jun
2	2015/06/01 03:23:00.000000000	2015	6	1	Jun
3	2015/06/01 04:56:00.000000000	2015	6	1	Jun
4	2015/06/01 08:16:00.000000000	2015	6	1	Jun
5	2015/06/01 08:22:00.000000000	2015	6	1	Jun
6	2015/06/01 08:59:00.000000000	2015	6	1	Jun
7	2015/06/01 09:11:00.000000000	2015	6	1	Jun
8	2015/06/01 14:11:00.000000000	2015	6	1	Jun
9	2015/06/01 16:41:00.000000000	2015	6	1	Jun
10	2015/06/01 17:39:00.000000000	2015	6	1	Jun
11	2015/06/01 19:09:00.000000000	2015	6	1	Jun
12	2015/06/01 19:27:00.000000000	2015	6	1	Jun
13	2015/06/01 21:18:00.000000000	2015	6	1	Jun
14	2015/06/01 22:20:00.000000000	2015	6	1	Jun

Rows of step: Calculator (1210 rows)

	arrival	year_id	month_id	day_id
1	2015/06/01 03:19:00.000000000	2015	6	1
2	2015/06/01 03:23:00.000000000	2015	6	1
3	2015/06/01 04:56:00.000000000	2015	6	1
4	2015/06/01 08:16:00.000000000	2015	6	1
5	2015/06/01 08:22:00.000000000	2015	6	1
6	2015/06/01 08:59:00.000000000	2015	6	1
7	2015/06/01 09:11:00.000000000	2015	6	1
8	2015/06/01 14:11:00.000000000	2015	6	1
9	2015/06/01 16:41:00.000000000	2015	6	1
10	2015/06/01 17:39:00.000000000	2015	6	1
11	2015/06/01 19:09:00.000000000	2015	6	1
12	2015/06/01 19:27:00.000000000	2015	6	1
13	2015/06/01 21:18:00.000000000	2015	6	1
14	2015/06/01 22:20:00.000000000	2015	6	1
15	2015/06/01 22:26:00.000000000	2015	6	1

Rows of step: Insert / update (1210 rows)

	arrival	year_id	month_id	day_id	month_name
1	2015/06/01 03:19:00.000000000	2015	6	1	Jun
2	2015/06/01 03:23:00.000000000	2015	6	1	Jun
3	2015/06/01 04:56:00.000000000	2015	6	1	Jun
4	2015/06/01 08:16:00.000000000	2015	6	1	Jun
5	2015/06/01 08:22:00.000000000	2015	6	1	Jun
6	2015/06/01 08:59:00.000000000	2015	6	1	Jun
7	2015/06/01 09:11:00.000000000	2015	6	1	Jun
8	2015/06/01 14:11:00.000000000	2015	6	1	Jun
9	2015/06/01 16:41:00.000000000	2015	6	1	Jun
10	2015/06/01 17:39:00.000000000	2015	6	1	Jun
11	2015/06/01 19:09:00.000000000	2015	6	1	Jun
12	2015/06/01 19:27:00.000000000	2015	6	1	Jun
13	2015/06/01 21:18:00.000000000	2015	6	1	Jun
14	2015/06/01 22:20:00.000000000	2015	6	1	Jun

dim_departure

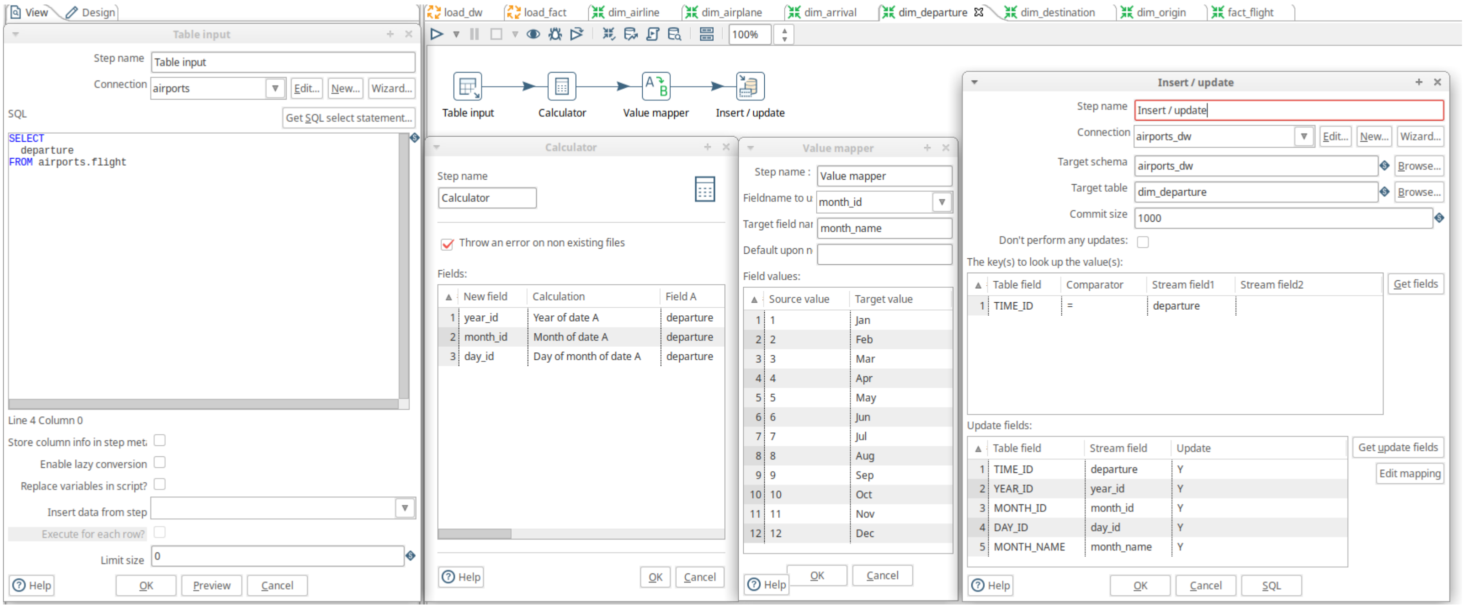


Table input

Step name: Table input

Connection: airports

SQL

```
SELECT
  departure
FROM airports.flight
```

Line 4 Column 0

Store column info in step met: □

Enable lazy conversion □

Replace variables in script? □

Insert data from step

Execute for each row? □

Limit size 0

Calculator

Step name: Calculator

☑ Throw an error on non existing files

Fields:

	New field	Calculation	Field A
1	year_id	Year of date A	departure
2	month_id	Month of date A	departure
3	day_id	Day of month of date A	departure

Value mapper

Step name : Value mapper

Fieldname to u: month_id

Target field nar: month_name

Default upon n:

Field values:

	Source value	Target value
1	1	Jan
2	2	Feb
3	3	Mar
4	4	Apr
5	5	May
6	6	Jun
7	7	Jul
8	8	Aug
9	9	Sep
10	10	Oct
11	11	Nov
12	12	Dec

Insert / update

Step name: Insert / update

Connection: airports_dw

Target schema: airports_dw

Target table: dim_departure

Commit size: 1000

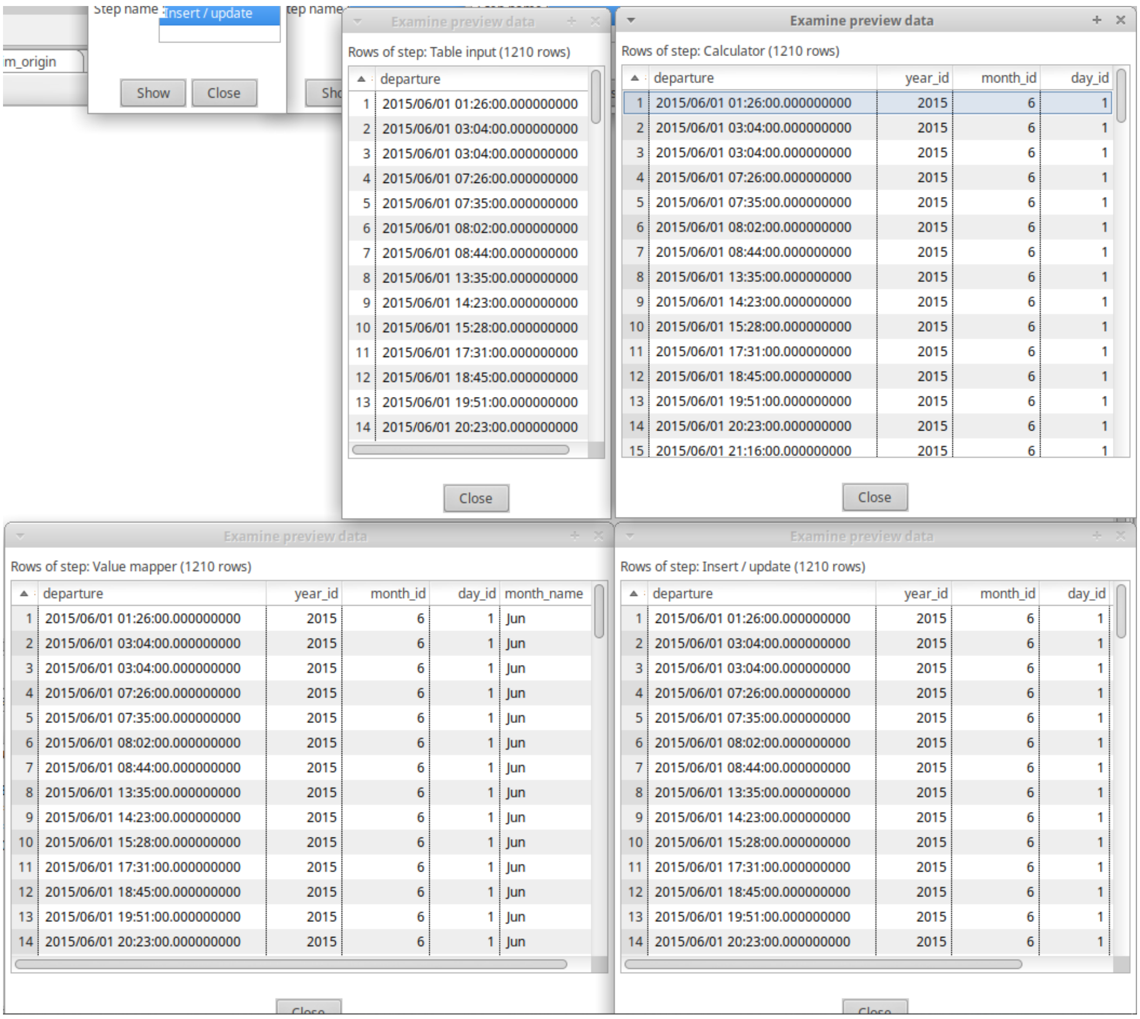
Don't perform any updates: □

The key(s) to look up the value(s):

	Table field	Comparator	Stream field1	Stream field2
1	TIME_ID	=	departure	

Update fields:

	Table field	Stream field	Update
1	TIME_ID	departure	Y
2	YEAR_ID	year_id	Y
3	MONTH_ID	month_id	Y
4	DAY_ID	day_id	Y
5	MONTH_NAME	month_name	Y



Rows of step: Table input (1210 rows)

	departure
1	2015/06/01 01:26:00.000000000
2	2015/06/01 03:04:00.000000000
3	2015/06/01 03:04:00.000000000
4	2015/06/01 07:26:00.000000000
5	2015/06/01 07:35:00.000000000
6	2015/06/01 08:02:00.000000000
7	2015/06/01 08:44:00.000000000
8	2015/06/01 13:35:00.000000000
9	2015/06/01 14:23:00.000000000
10	2015/06/01 15:28:00.000000000
11	2015/06/01 17:31:00.000000000
12	2015/06/01 18:45:00.000000000
13	2015/06/01 19:51:00.000000000
14	2015/06/01 20:23:00.000000000

Rows of step: Calculator (1210 rows)

	departure	year_id	month_id	day_id
1	2015/06/01 01:26:00.000000000	2015	6	1
2	2015/06/01 03:04:00.000000000	2015	6	1
3	2015/06/01 03:04:00.000000000	2015	6	1
4	2015/06/01 07:26:00.000000000	2015	6	1
5	2015/06/01 07:35:00.000000000	2015	6	1
6	2015/06/01 08:02:00.000000000	2015	6	1
7	2015/06/01 08:44:00.000000000	2015	6	1
8	2015/06/01 13:35:00.000000000	2015	6	1
9	2015/06/01 14:23:00.000000000	2015	6	1
10	2015/06/01 15:28:00.000000000	2015	6	1
11	2015/06/01 17:31:00.000000000	2015	6	1
12	2015/06/01 18:45:00.000000000	2015	6	1
13	2015/06/01 19:51:00.000000000	2015	6	1
14	2015/06/01 20:23:00.000000000	2015	6	1
15	2015/06/01 21:16:00.000000000	2015	6	1

Rows of step: Value mapper (1210 rows)

	departure	year_id	month_id	day_id	month_name
1	2015/06/01 01:26:00.000000000	2015	6	1	Jun
2	2015/06/01 03:04:00.000000000	2015	6	1	Jun
3	2015/06/01 03:04:00.000000000	2015	6	1	Jun
4	2015/06/01 07:26:00.000000000	2015	6	1	Jun
5	2015/06/01 07:35:00.000000000	2015	6	1	Jun
6	2015/06/01 08:02:00.000000000	2015	6	1	Jun
7	2015/06/01 08:44:00.000000000	2015	6	1	Jun
8	2015/06/01 13:35:00.000000000	2015	6	1	Jun
9	2015/06/01 14:23:00.000000000	2015	6	1	Jun
10	2015/06/01 15:28:00.000000000	2015	6	1	Jun
11	2015/06/01 17:31:00.000000000	2015	6	1	Jun
12	2015/06/01 18:45:00.000000000	2015	6	1	Jun
13	2015/06/01 19:51:00.000000000	2015	6	1	Jun
14	2015/06/01 20:23:00.000000000	2015	6	1	Jun

Rows of step: Insert / update (1210 rows)

	departure	year_id	month_id	day_id
1	2015/06/01 01:26:00.000000000	2015	6	1
2	2015/06/01 03:04:00.000000000	2015	6	1
3	2015/06/01 03:04:00.000000000	2015	6	1
4	2015/06/01 07:26:00.000000000	2015	6	1
5	2015/06/01 07:35:00.000000000	2015	6	1
6	2015/06/01 08:02:00.000000000	2015	6	1
7	2015/06/01 08:44:00.000000000	2015	6	1
8	2015/06/01 13:35:00.000000000	2015	6	1
9	2015/06/01 14:23:00.000000000	2015	6	1
10	2015/06/01 15:28:00.000000000	2015	6	1
11	2015/06/01 17:31:00.000000000	2015	6	1
12	2015/06/01 18:45:00.000000000	2015	6	1
13	2015/06/01 19:51:00.000000000	2015	6	1
14	2015/06/01 20:23:00.000000000	2015	6	1

dim_airport

(Note: *dim_origin* and *dim_destination* were replaced by *dim_airport*.)

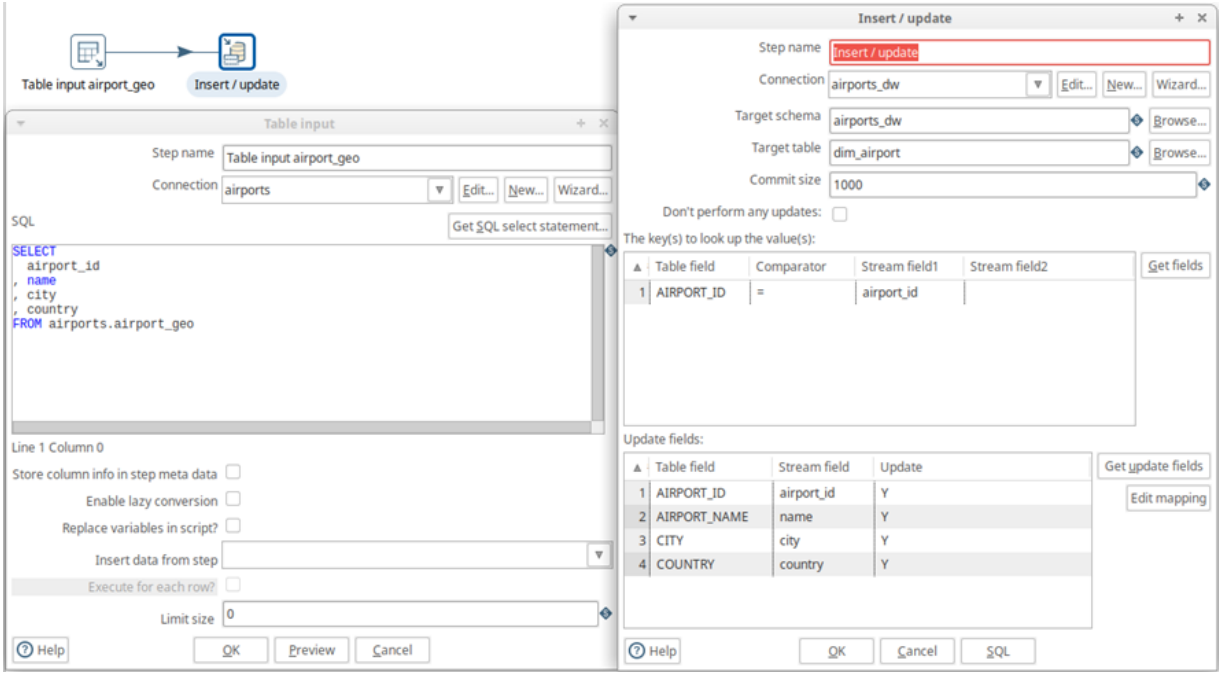


Table input

Step name: Table input airport_geo

Connection: airports

SQL

```
SELECT
  airport_id
, name
, city
, country
FROM airports.airport_geo
```

Line 1 Column 0

Store column info in step meta data □

Enable lazy conversion □

Replace variables in script? □

Insert data from step:

Execute for each row? □

Limit size: 0

Insert / update

Step name: Insert / update

Connection: airports_dw

Target schema: airports_dw

Target table: dim_airport

Commit size: 1000

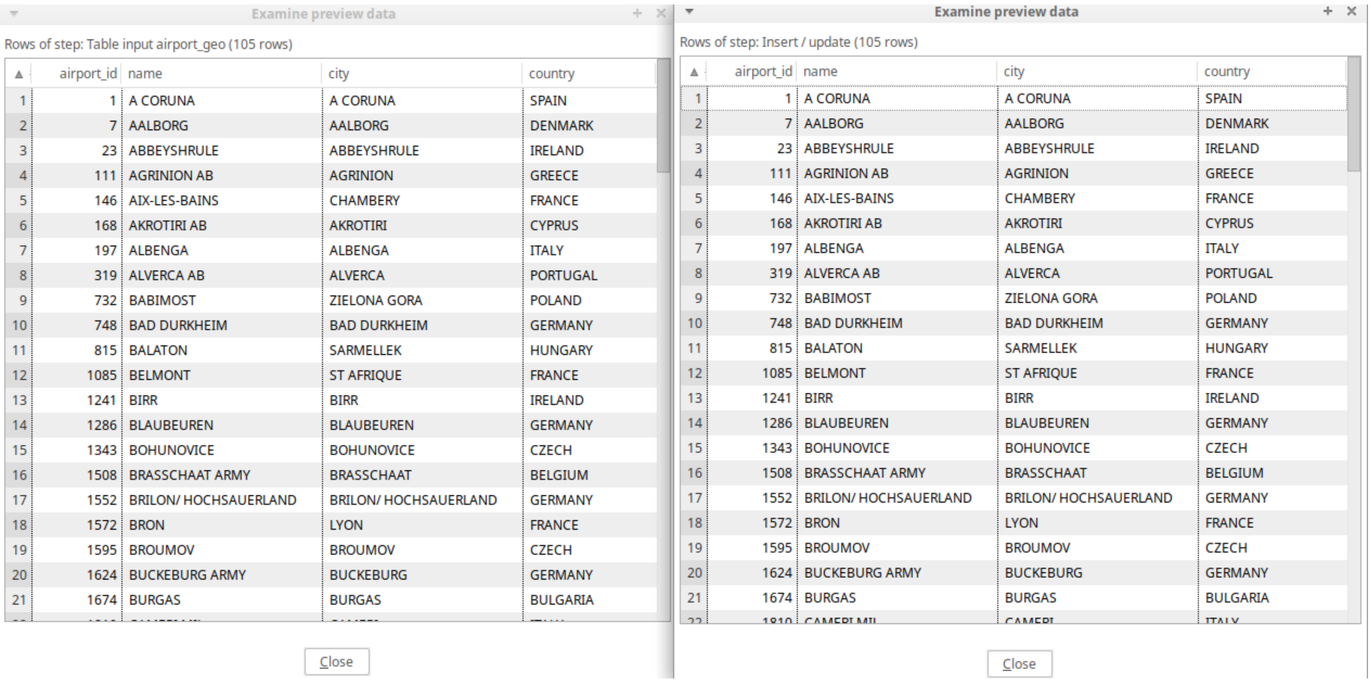
Don't perform any updates: □

The key(s) to look up the value(s):

	Table field	Comparator	Stream field1	Stream field2
1	AIRPORT_ID	=	airport_id	

Update fields:

	Table field	Stream field	Update
1	AIRPORT_ID	airport_id	Y
2	AIRPORT_NAME	name	Y
3	CITY	city	Y
4	COUNTRY	country	Y



Examine preview data

Rows of step: Table input airport_geo (105 rows)

	airport_id	name	city	country
1	1	A CORUNA	A CORUNA	SPAIN
2	7	AALBORG	AALBORG	DENMARK
3	23	ABBEYSHRULE	ABBEYSHRULE	IRELAND
4	111	AGRINION AB	AGRINION	GREECE
5	146	AIX-LES-BAINS	CHAMBERY	FRANCE
6	168	AKROTIRI AB	AKROTIRI	CYPRUS
7	197	ALBENGA	ALBENGA	ITALY
8	319	ALVERCA AB	ALVERCA	PORTUGAL
9	732	BABIMOST	ZIELONA GORA	POLAND
10	748	BAD DURKHEIM	BAD DURKHEIM	GERMANY
11	815	BALATON	SARMELLEK	HUNGARY
12	1085	BELMONT	ST AFRIQUE	FRANCE
13	1241	BIRR	BIRR	IRELAND
14	1286	BLAUBEUREN	BLAUBEUREN	GERMANY
15	1343	BOHUNOVICE	BOHUNOVICE	CZECH
16	1508	BRASSCHAAT ARMY	BRASSCHAAT	BELGIUM
17	1552	BRILON/ HOCHSAUERLAND	BRILON/ HOCHSAUERLAND	GERMANY
18	1572	BRON	LYON	FRANCE
19	1595	BROUMOV	BROUMOV	CZECH
20	1624	BUCKEBURG ARMY	BUCKEBURG	GERMANY
21	1674	BURGAS	BURGAS	BULGARIA

Examine preview data

Rows of step: Insert / update (105 rows)

	airport_id	name	city	country
1	1	A CORUNA	A CORUNA	SPAIN
2	7	AALBORG	AALBORG	DENMARK
3	23	ABBEYSHRULE	ABBEYSHRULE	IRELAND
4	111	AGRINION AB	AGRINION	GREECE
5	146	AIX-LES-BAINS	CHAMBERY	FRANCE
6	168	AKROTIRI AB	AKROTIRI	CYPRUS
7	197	ALBENGA	ALBENGA	ITALY
8	319	ALVERCA AB	ALVERCA	PORTUGAL
9	732	BABIMOST	ZIELONA GORA	POLAND
10	748	BAD DURKHEIM	BAD DURKHEIM	GERMANY
11	815	BALATON	SARMELLEK	HUNGARY
12	1085	BELMONT	ST AFRIQUE	FRANCE
13	1241	BIRR	BIRR	IRELAND
14	1286	BLAUBEUREN	BLAUBEUREN	GERMANY
15	1343	BOHUNOVICE	BOHUNOVICE	CZECH
16	1508	BRASSCHAAT ARMY	BRASSCHAAT	BELGIUM
17	1552	BRILON/ HOCHSAUERLAND	BRILON/ HOCHSAUERLAND	GERMANY
18	1572	BRON	LYON	FRANCE
19	1595	BROUMOV	BROUMOV	CZECH
20	1624	BUCKEBURG ARMY	BUCKEBURG	GERMANY
21	1674	BURGAS	BURGAS	BULGARIA

fact_flight

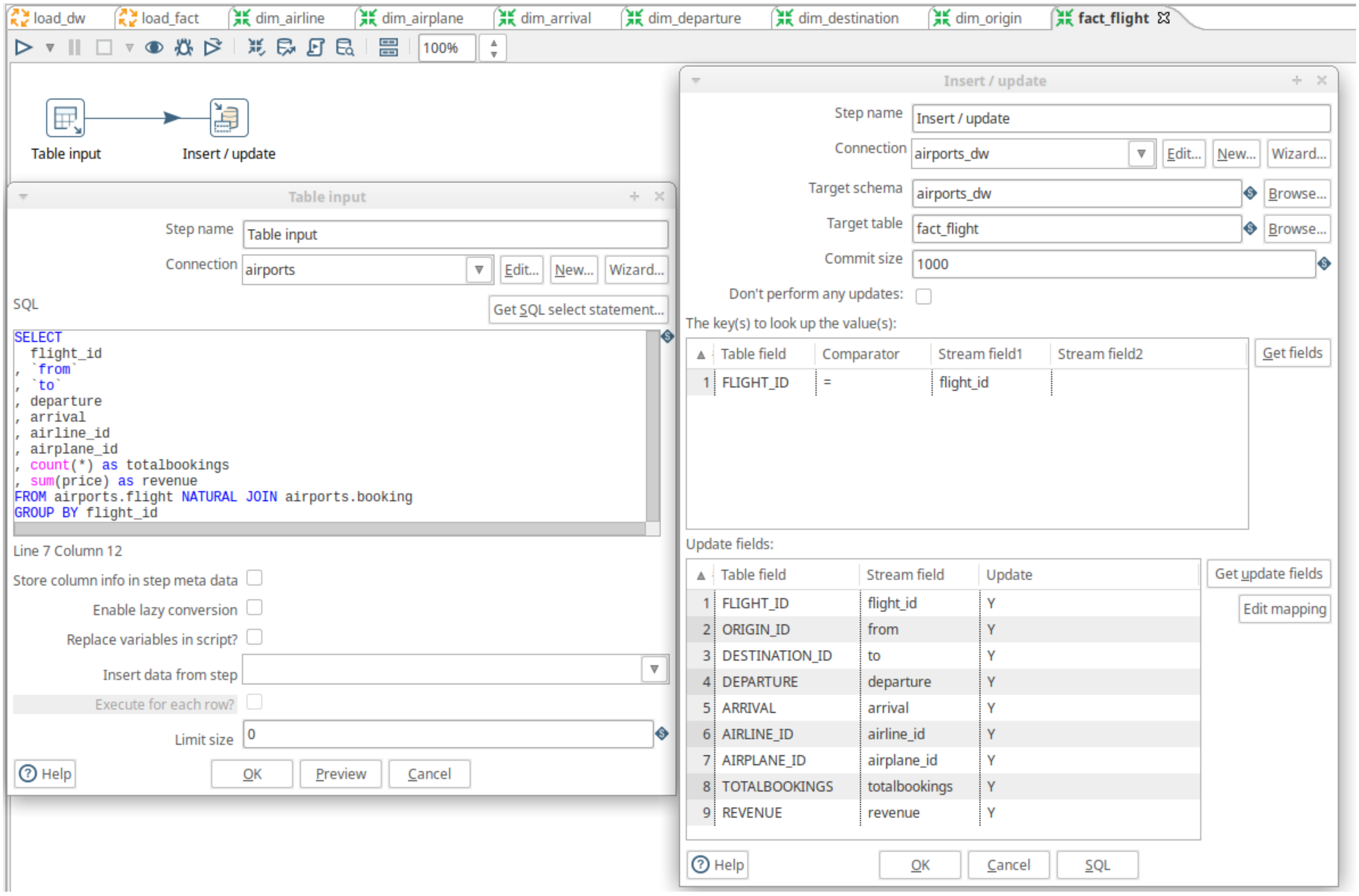


Table input

Step name: Table input

Connection: airports

SQL

```
SELECT
  flight_id
, `from`
, `to`
, departure
, arrival
, airline_id
, airplane_id
, count(*) as totalbookings
, sum(price) as revenue
FROM airports.flight NATURAL JOIN airports.booking
GROUP BY flight_id
```

Line 7 Column 12

Store column info in step meta data □

Enable lazy conversion □

Replace variables in script? □

Insert data from step:

Execute for each row? □

Limit size: 0

Insert / update

Step name: Insert / update

Connection: airports_dw

Target schema: airports_dw

Target table: fact_flight

Commit size: 1000

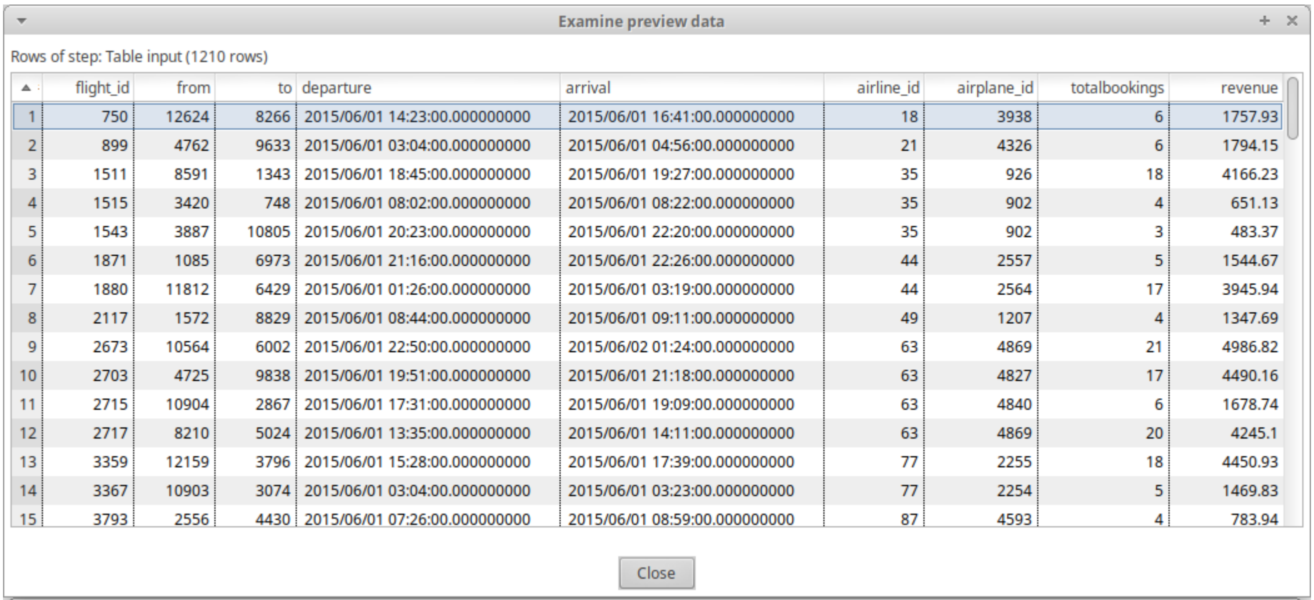
Don't perform any updates: □

The key(s) to look up the value(s):

#	Table field	Comparator	Stream field1	Stream field2
1	FLIGHT_ID	=	flight_id	

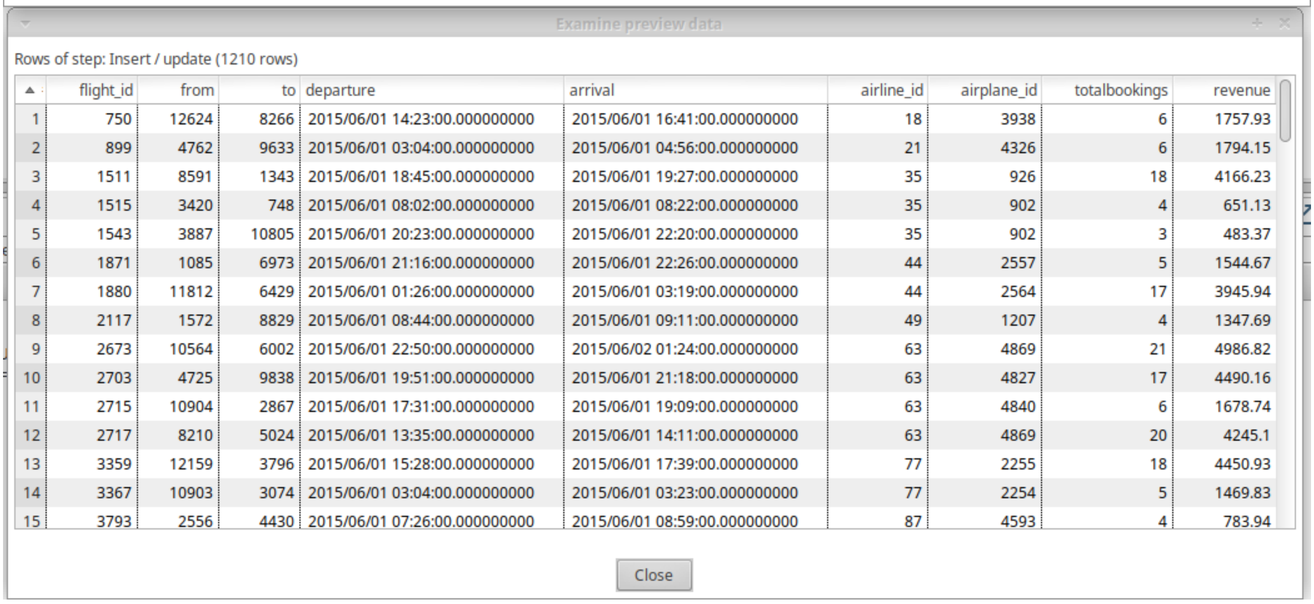
Update fields:

#	Table field	Stream field	Update
1	FLIGHT_ID	flight_id	Y
2	ORIGIN_ID	from	Y
3	DESTINATION_ID	to	Y
4	DEPARTURE	departure	Y
5	ARRIVAL	arrival	Y
6	AIRLINE_ID	airline_id	Y
7	AIRPLANE_ID	airplane_id	Y
8	TOTALBOOKINGS	totalbookings	Y
9	REVENUE	revenue	Y



Rows of step: Table input (1210 rows)

	flight_id	from	to	departure	arrival	airline_id	airplane_id	totalbookings	revenue
1	750	12624	8266	2015/06/01 14:23:00.000000000	2015/06/01 16:41:00.000000000	18	3938	6	1757.93
2	899	4762	9633	2015/06/01 03:04:00.000000000	2015/06/01 04:56:00.000000000	21	4326	6	1794.15
3	1511	8591	1343	2015/06/01 18:45:00.000000000	2015/06/01 19:27:00.000000000	35	926	18	4166.23
4	1515	3420	748	2015/06/01 08:02:00.000000000	2015/06/01 08:22:00.000000000	35	902	4	651.13
5	1543	3887	10805	2015/06/01 20:23:00.000000000	2015/06/01 22:20:00.000000000	35	902	3	483.37
6	1871	1085	6973	2015/06/01 21:16:00.000000000	2015/06/01 22:26:00.000000000	44	2557	5	1544.67
7	1880	11812	6429	2015/06/01 01:26:00.000000000	2015/06/01 03:19:00.000000000	44	2564	17	3945.94
8	2117	1572	8829	2015/06/01 08:44:00.000000000	2015/06/01 09:11:00.000000000	49	1207	4	1347.69
9	2673	10564	6002	2015/06/01 22:50:00.000000000	2015/06/02 01:24:00.000000000	63	4869	21	4986.82
10	2703	4725	9838	2015/06/01 19:51:00.000000000	2015/06/01 21:18:00.000000000	63	4827	17	4490.16
11	2715	10904	2867	2015/06/01 17:31:00.000000000	2015/06/01 19:09:00.000000000	63	4840	6	1678.74
12	2717	8210	5024	2015/06/01 13:35:00.000000000	2015/06/01 14:11:00.000000000	63	4869	20	4245.1
13	3359	12159	3796	2015/06/01 15:28:00.000000000	2015/06/01 17:39:00.000000000	77	2255	18	4450.93
14	3367	10903	3074	2015/06/01 03:04:00.000000000	2015/06/01 03:23:00.000000000	77	2254	5	1469.83
15	3793	2556	4430	2015/06/01 07:26:00.000000000	2015/06/01 08:59:00.000000000	87	4593	4	783.94

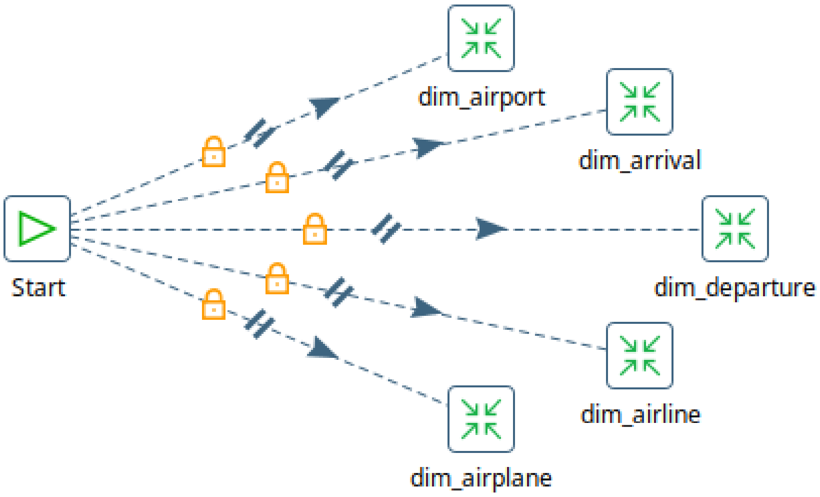


Rows of step: Insert / update (1210 rows)

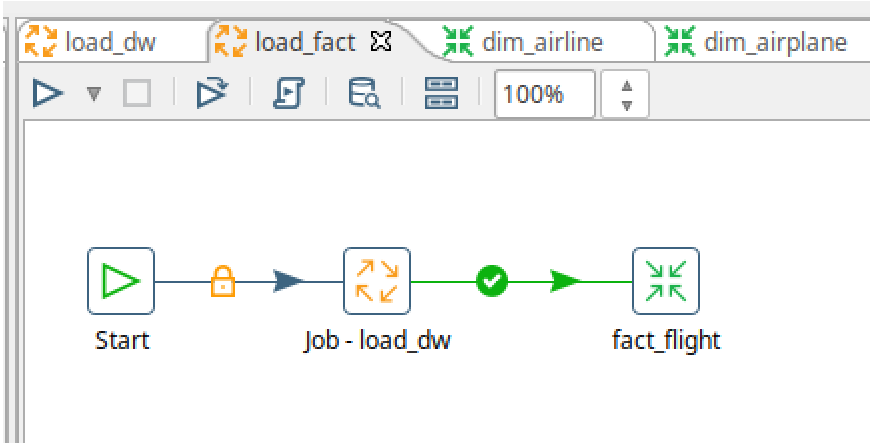
	flight_id	from	to	departure	arrival	airline_id	airplane_id	totalbookings	revenue
1	750	12624	8266	2015/06/01 14:23:00.000000000	2015/06/01 16:41:00.000000000	18	3938	6	1757.93
2	899	4762	9633	2015/06/01 03:04:00.000000000	2015/06/01 04:56:00.000000000	21	4326	6	1794.15
3	1511	8591	1343	2015/06/01 18:45:00.000000000	2015/06/01 19:27:00.000000000	35	926	18	4166.23
4	1515	3420	748	2015/06/01 08:02:00.000000000	2015/06/01 08:22:00.000000000	35	902	4	651.13
5	1543	3887	10805	2015/06/01 20:23:00.000000000	2015/06/01 22:20:00.000000000	35	902	3	483.37
6	1871	1085	6973	2015/06/01 21:16:00.000000000	2015/06/01 22:26:00.000000000	44	2557	5	1544.67
7	1880	11812	6429	2015/06/01 01:26:00.000000000	2015/06/01 03:19:00.000000000	44	2564	17	3945.94
8	2117	1572	8829	2015/06/01 08:44:00.000000000	2015/06/01 09:11:00.000000000	49	1207	4	1347.69
9	2673	10564	6002	2015/06/01 22:50:00.000000000	2015/06/02 01:24:00.000000000	63	4869	21	4986.82
10	2703	4725	9838	2015/06/01 19:51:00.000000000	2015/06/01 21:18:00.000000000	63	4827	17	4490.16
11	2715	10904	2867	2015/06/01 17:31:00.000000000	2015/06/01 19:09:00.000000000	63	4840	6	1678.74
12	2717	8210	5024	2015/06/01 13:35:00.000000000	2015/06/01 14:11:00.000000000	63	4869	20	4245.1
13	3359	12159	3796	2015/06/01 15:28:00.000000000	2015/06/01 17:39:00.000000000	77	2255	18	4450.93
14	3367	10903	3074	2015/06/01 03:04:00.000000000	2015/06/01 03:23:00.000000000	77	2254	5	1469.83
15	3793	2556	4430	2015/06/01 07:26:00.000000000	2015/06/01 08:59:00.000000000	87	4593	4	783.94

Jobs

load_dw – Loads dimensions in parallel.



load_fact – Loads *fact_flight* table after all dimensions are loaded.



Cube Definition

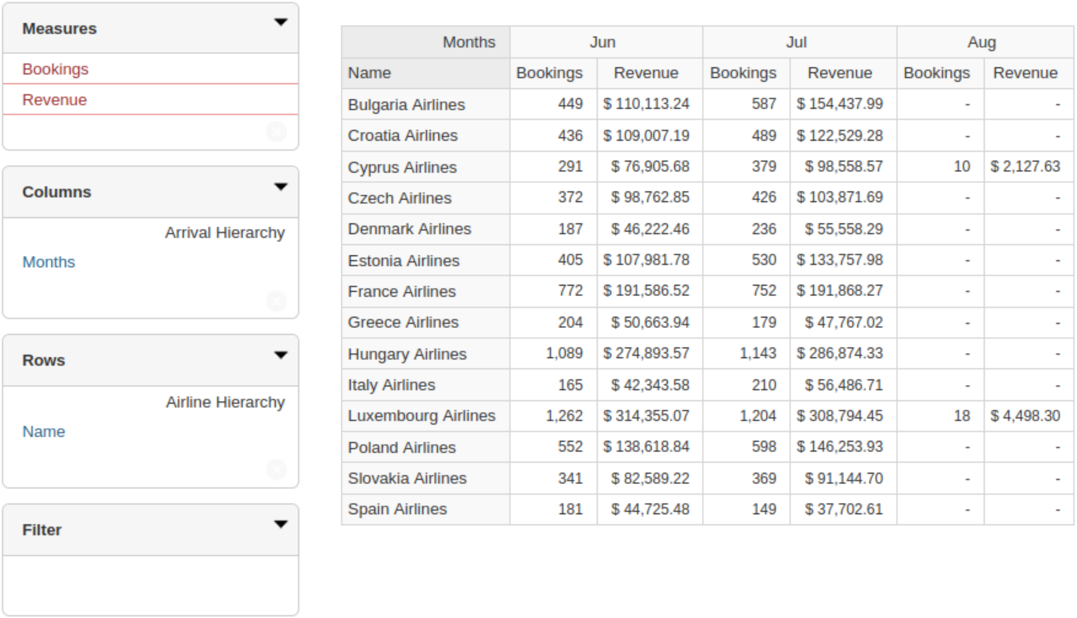
```
<Schema name="airports_dw">
  <Cube name="Flights" visible="true" cache="true" enabled="true">
    <Table name="fact_flight">
    </Table>
    <Dimension type="StandardDimension" visible="true" foreignKey="ORIGIN_ID"
highCardinality="false" name="Origin">
      <Hierarchy name="Origin Hierarchy" visible="true" hasAll="true"
allMemberName="AllOrigins" primaryKey="AIRPORT_ID">
        <Table name="dim_airport">
        </Table>
        <Level name="Country" visible="true" column="COUNTRY" type="String"
uniqueMembers="false" levelType="Regular" hideMemberIf="Never">
        </Level>
        <Level name="City" visible="true" column="CITY" type="String"
uniqueMembers="false" levelType="Regular" hideMemberIf="Never">
        </Level>
        <Level name="Airport Name" visible="true" column="AIRPORT_NAME" type="String"
uniqueMembers="false" levelType="Regular" hideMemberIf="Never">
        </Level>
      </Hierarchy>
    </Dimension>
    <Dimension type="StandardDimension" visible="true" foreignKey="DESTINATION_ID"
highCardinality="false" name="Destination">
      <Hierarchy name="Destination Hierarchy" visible="true" hasAll="true"
allMemberName="All Destinations" primaryKey="AIRPORT_ID">
        <Table name="dim_airport">
        </Table>
        <Level name="Country" visible="true" column="COUNTRY" type="String"
uniqueMembers="false" levelType="Regular" hideMemberIf="Never">
        </Level>
        <Level name="City" visible="true" column="CITY" type="String"
uniqueMembers="false" levelType="Regular" hideMemberIf="Never">
        </Level>
        <Level name="Airport Name" visible="true" column="AIRPORT_NAME" type="String"
uniqueMembers="false" levelType="Regular" hideMemberIf="Never">
        </Level>
      </Hierarchy>
    </Dimension>
    <Dimension type="TimeDimension" visible="true" foreignKey="DEPARTURE"
highCardinality="false" name="Departure">
      <Hierarchy name="Departure Hierarchy" visible="true" hasAll="true"
allMemberName="All Departures" primaryKey="TIME_ID">
        <Table name="dim_departure">
        </Table>
        <Level name="Year" visible="true" column="YEAR_ID" type="Integer"
uniqueMembers="false" levelType="TimeYears" hideMemberIf="Never">
        </Level>
```

```xml
        <Level name="Months" visible="true" column="MONTH_NAME" ordinalColumn="MONTH_ID" type="String" uniqueMembers="false" levelType="TimeMonths" hideMemberIf="Never">
        </Level>
        <Level name="Days" visible="true" column="DAY_ID" type="Integer" uniqueMembers="false" levelType="TimeDays" hideMemberIf="Never">
        </Level>
      </Hierarchy>
    </Dimension>
    <Dimension type="TimeDimension" visible="true" foreignKey="ARRIVAL" highCardinality="false" name="Arrival">
      <Hierarchy name="Arrival Hierarchy" visible="true" hasAll="true" allMemberName="All Arrivals" primaryKey="TIME_ID">
        <Table name="dim_arrival">
        </Table>
        <Level name="Year" visible="true" column="YEAR_ID" type="Integer" uniqueMembers="false" levelType="TimeYears" hideMemberIf="Never">
        </Level>
        <Level name="Months" visible="true" column="MONTH_NAME" ordinalColumn="MONTH_ID" type="String" uniqueMembers="false" levelType="TimeMonths" hideMemberIf="Never">
        </Level>
        <Level name="Days" visible="true" column="DAY_ID" type="Integer" uniqueMembers="false" levelType="TimeDays" hideMemberIf="Never">
        </Level>
      </Hierarchy>
    </Dimension>
    <Dimension type="StandardDimension" visible="true" foreignKey="AIRPLANE_ID" highCardinality="false" name="Airplane">
      <Hierarchy name="Airplane Hierarchy" visible="true" hasAll="true" allMemberName="All Airplanes" primaryKey="AIRPLANE_ID">
        <Table name="dim_airplane">
        </Table>
        <Level name="Type" visible="true" column="AIRPLANE_TYPE" type="Integer" uniqueMembers="false" levelType="Regular" hideMemberIf="Never">
        </Level>
      </Hierarchy>
    </Dimension>
    <Dimension type="StandardDimension" visible="true" foreignKey="AIRLINE_ID" highCardinality="false" name="Airlines">
      <Hierarchy name="Airline Hierarchy" visible="true" hasAll="true" allMemberName="All Airlines" primaryKey="AIRLINE_ID">
        <Table name="dim_airline">
        </Table>
        <Level name="Name" visible="true" column="AIRLINE_NAME" type="String" uniqueMembers="false" levelType="Regular" hideMemberIf="Never">
        </Level>
      </Hierarchy>
    </Dimension>
    <Measure name="Bookings" column="TOTALBOOKINGS" datatype="Integer"
formatString="#,###" aggregator="sum" visible="true">
    </Measure>
    <Measure name="Revenue" column="REVENUE" datatype="Integer" formatString="$
#,###.00" aggregator="sum" visible="true">
    </Measure>
  </Cube>
</Schema>
```

Saiku Analysis

airports.sql

Passengers and revenue by airline and month.



Measures

Bookings

Revenue

Columns

Arrival Hierarchy

Months

Rows

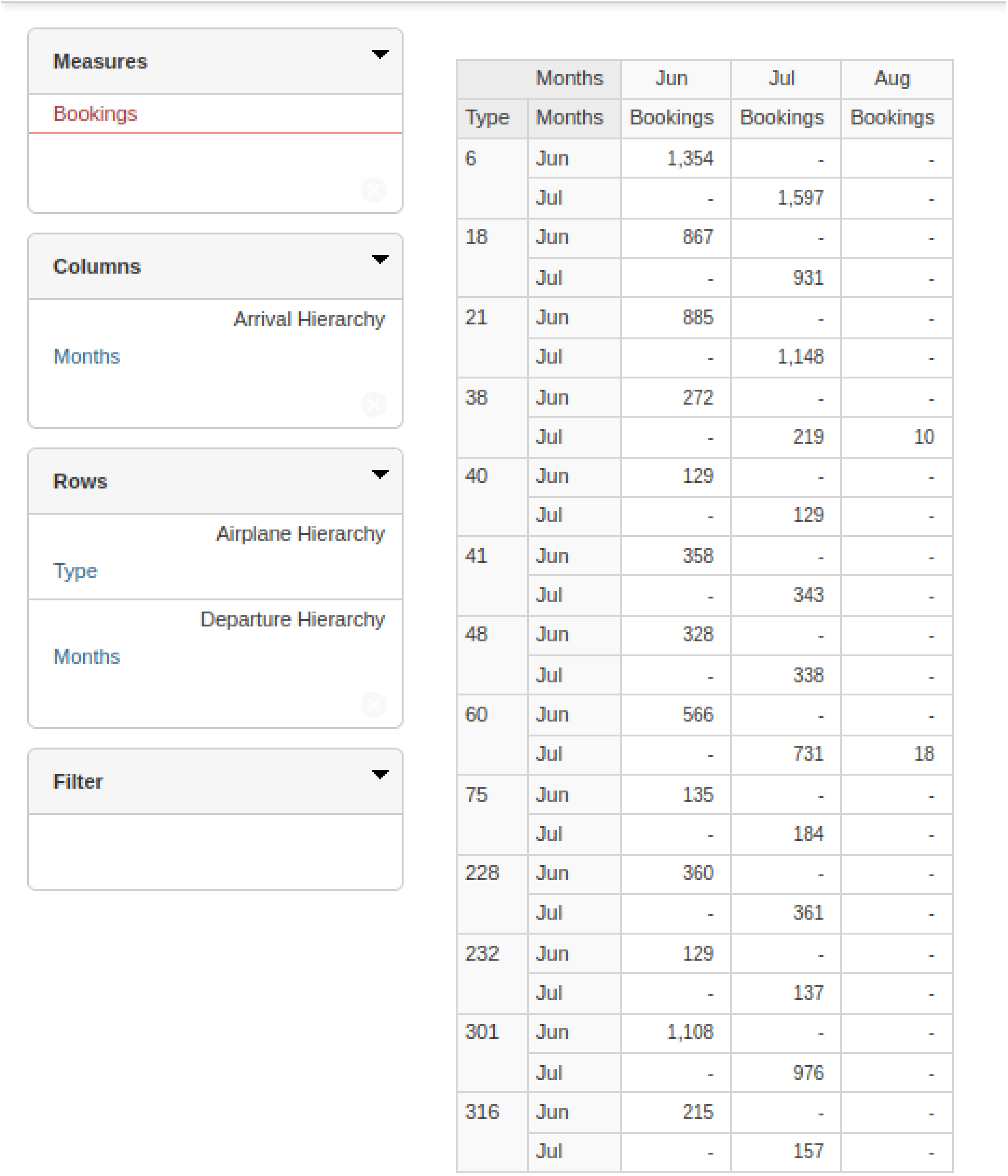
Airline Hierarchy

Name

Filter

Months	Jun		Jul		Aug	
Name	Bookings	Revenue	Bookings	Revenue	Bookings	Revenue
Bulgaria Airlines	449	$ 110,113.24	587	$ 154,437.99	-	-
Croatia Airlines	436	$ 109,007.19	489	$ 122,529.28	-	-
Cyprus Airlines	291	$ 76,905.68	379	$ 98,558.57	10	$ 2,127.63
Czech Airlines	372	$ 98,762.85	426	$ 103,871.69	-	-
Denmark Airlines	187	$ 46,222.46	236	$ 55,558.29	-	-
Estonia Airlines	405	$ 107,981.78	530	$ 133,757.98	-	-
France Airlines	772	$ 191,586.52	752	$ 191,868.27	-	-
Greece Airlines	204	$ 50,663.94	179	$ 47,767.02	-	-
Hungary Airlines	1,089	$ 274,893.57	1,143	$ 286,874.33	-	-
Italy Airlines	165	$ 42,343.58	210	$ 56,486.71	-	-
Luxembourg Airlines	1,262	$ 314,355.07	1,204	$ 308,794.45	18	$ 4,498.30
Poland Airlines	552	$ 138,618.84	598	$ 146,253.93	-	-
Slovakia Airlines	341	$ 82,589.22	369	$ 91,144.70	-	-
Spain Airlines	181	$ 44,725.48	149	$ 37,702.61	-	-

Airplane type and month of departure by month of arrival.
(2 airplane types departed in July and arrived in August.)



Measures

Bookings

Columns

Arrival Hierarchy

Months

Rows

Airplane Hierarchy

Type

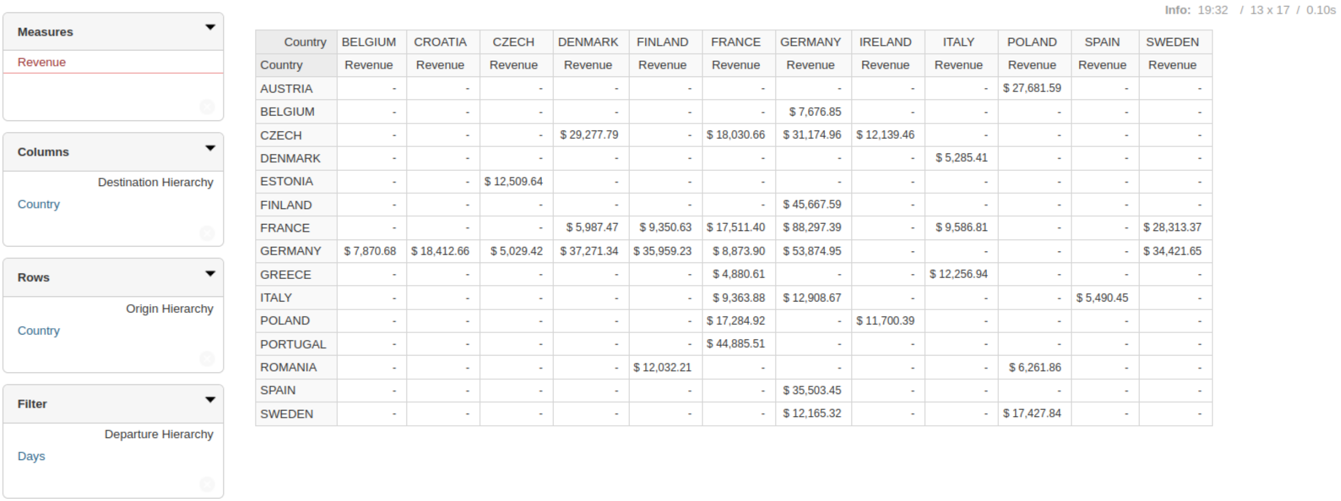
Departure Hierarchy

Months

Filter

	Months	Jun	Jul	Aug
Type	Months	Bookings	Bookings	Bookings
6	Jun	1,354	-	-
	Jul	-	1,597	-
18	Jun	867	-	-
	Jul	-	931	-
21	Jun	885	-	-
	Jul	-	1,148	-
38	Jun	272	-	-
	Jul	-	219	10
40	Jun	129	-	-
	Jul	-	129	-
41	Jun	358	-	-
	Jul	-	343	-
48	Jun	328	-	-
	Jul	-	338	-
60	Jun	566	-	-
	Jul	-	731	18
75	Jun	135	-	-
	Jul	-	184	-
228	Jun	360	-	-
	Jul	-	361	-
232	Jun	129	-	-
	Jul	-	137	-
301	Jun	1,108	-	-
	Jul	-	976	-
316	Jun	215	-	-
	Jul	-	157	-

Money spent/gained on flights between countries.
(On the 10 days with highest revenue – filter option.)



Measures

Revenue

Columns

Destination Hierarchy

Country

Rows

Origin Hierarchy

Country

Filter

Departure Hierarchy

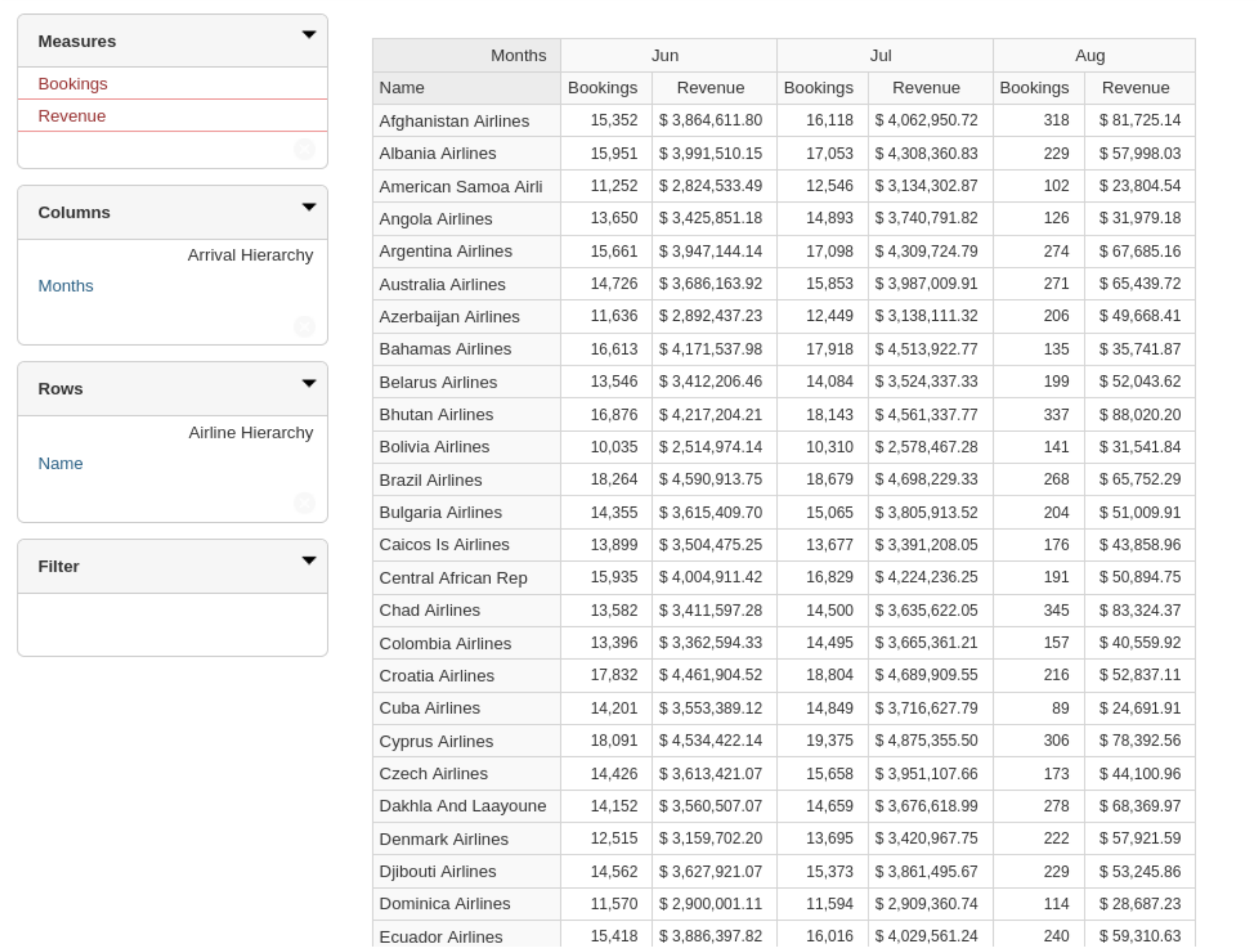
Days

Info: 19:32 / 13 x 17 / 0.10s

Country	BELGIUM	CROATIA	CZECH	DENMARK	FINLAND	FRANCE	GERMANY	IRELAND	ITALY	POLAND	SPAIN	SWEDEN
Country	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue
AUSTRIA	-	-	-	-	-	-	-	-	-	$ 27,681.59	-	-
BELGIUM	-	-	-	-	-	-	$ 7,676.85	-	-	-	-	-
CZECH	-	-	-	$ 29,277.79	-	$ 18,030.66	$ 31,174.96	$ 12,139.46	-	-	-	-
DENMARK	-	-	-	-	-	-	-	-	$ 5,285.41	-	-	-
ESTONIA	-	-	$ 12,509.64	-	-	-	-	-	-	-	-	-
FINLAND	-	-	-	-	-	-	$ 45,667.59	-	-	-	-	-
FRANCE	-	-	-	$ 5,987.47	$ 9,350.63	$ 17,511.40	$ 88,297.39	-	$ 9,586.81	-	-	$ 28,313.37
GERMANY	$ 7,870.68	$ 18,412.66	$ 5,029.42	$ 37,271.34	$ 35,959.23	$ 8,873.90	$ 53,874.95	-	-	-	-	$ 34,421.65
GREECE	-	-	-	-	-	$ 4,880.61	-	-	$ 12,256.94	-	-	-
ITALY	-	-	-	-	-	$ 9,363.88	$ 12,908.67	-	-	-	$ 5,490.45	-
POLAND	-	-	-	-	-	$ 17,284.92	-	$ 11,700.39	-	-	-	-
PORTUGAL	-	-	-	-	-	$ 44,885.51	-	-	-	-	-	-
ROMANIA	-	-	-	-	$ 12,032.21	-	-	-	-	$ 6,261.86	-	-
SPAIN	-	-	-	-	-	-	$ 35,503.45	-	-	-	-	-
SWEDEN	-	-	-	-	-	-	$ 12,165.32	-	-	$ 17,427.84	-	-

airports-large.sql

Passengers and revenue by airline and month.



Measures
Bookings
Revenue

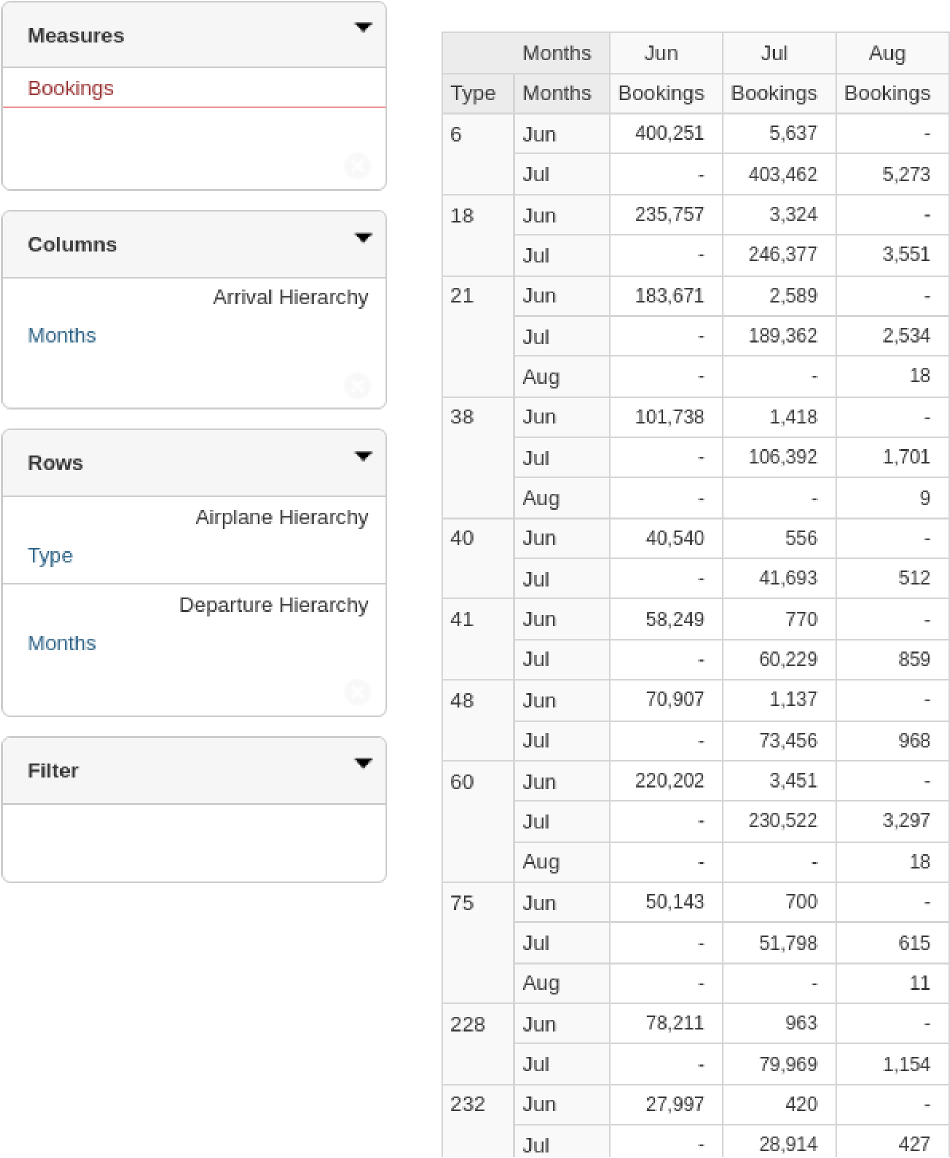
Columns
Arrival Hierarchy
Months

Rows
Airline Hierarchy
Name

Filter

Months	Jun		Jul		Aug	
Name	Bookings	Revenue	Bookings	Revenue	Bookings	Revenue
Afghanistan Airlines	15,352	$ 3,864,611.80	16,118	$ 4,062,950.72	318	$ 81,725.14
Albania Airlines	15,951	$ 3,991,510.15	17,053	$ 4,308,360.83	229	$ 57,998.03
American Samoa Airli	11,252	$ 2,824,533.49	12,546	$ 3,134,302.87	102	$ 23,804.54
Angola Airlines	13,650	$ 3,425,851.18	14,893	$ 3,740,791.82	126	$ 31,979.18
Argentina Airlines	15,661	$ 3,947,144.14	17,098	$ 4,309,724.79	274	$ 67,685.16
Australia Airlines	14,726	$ 3,686,163.92	15,853	$ 3,987,009.91	271	$ 65,439.72
Azerbaijan Airlines	11,636	$ 2,892,437.23	12,449	$ 3,138,111.32	206	$ 49,668.41
Bahamas Airlines	16,613	$ 4,171,537.98	17,918	$ 4,513,922.77	135	$ 35,741.87
Belarus Airlines	13,546	$ 3,412,206.46	14,084	$ 3,524,337.33	199	$ 52,043.62
Bhutan Airlines	16,876	$ 4,217,204.21	18,143	$ 4,561,337.77	337	$ 88,020.20
Bolivia Airlines	10,035	$ 2,514,974.14	10,310	$ 2,578,467.28	141	$ 31,541.84
Brazil Airlines	18,264	$ 4,590,913.75	18,679	$ 4,698,229.33	268	$ 65,752.29
Bulgaria Airlines	14,355	$ 3,615,409.70	15,065	$ 3,805,913.52	204	$ 51,009.91
Caicos Is Airlines	13,899	$ 3,504,475.25	13,677	$ 3,391,208.05	176	$ 43,858.96
Central African Rep	15,935	$ 4,004,911.42	16,829	$ 4,224,236.25	191	$ 50,894.75
Chad Airlines	13,582	$ 3,411,597.28	14,500	$ 3,635,622.05	345	$ 83,324.37
Colombia Airlines	13,396	$ 3,362,594.33	14,495	$ 3,665,361.21	157	$ 40,559.92
Croatia Airlines	17,832	$ 4,461,904.52	18,804	$ 4,689,909.55	216	$ 52,837.11
Cuba Airlines	14,201	$ 3,553,389.12	14,849	$ 3,716,627.79	89	$ 24,691.91
Cyprus Airlines	18,091	$ 4,534,422.14	19,375	$ 4,875,355.50	306	$ 78,392.56
Czech Airlines	14,426	$ 3,613,421.07	15,658	$ 3,951,107.66	173	$ 44,100.96
Dakhla And Laayoune	14,152	$ 3,560,507.07	14,659	$ 3,676,618.99	278	$ 68,369.97
Denmark Airlines	12,515	$ 3,159,702.20	13,695	$ 3,420,967.75	222	$ 57,921.59
Djibouti Airlines	14,562	$ 3,627,921.07	15,373	$ 3,861,495.67	229	$ 53,245.86
Dominica Airlines	11,570	$ 2,900,001.11	11,594	$ 2,909,360.74	114	$ 28,687.23
Ecuador Airlines	15,418	$ 3,886,397.82	16,016	$ 4,029,561.24	240	$ 59,310.63

Airplane type and month of departure by month of arrival.
(2 airplane types departed in July and arrived in August.)



Measures

Bookings

Columns

Arrival Hierarchy

Months

Rows

Airplane Hierarchy

Type

Departure Hierarchy

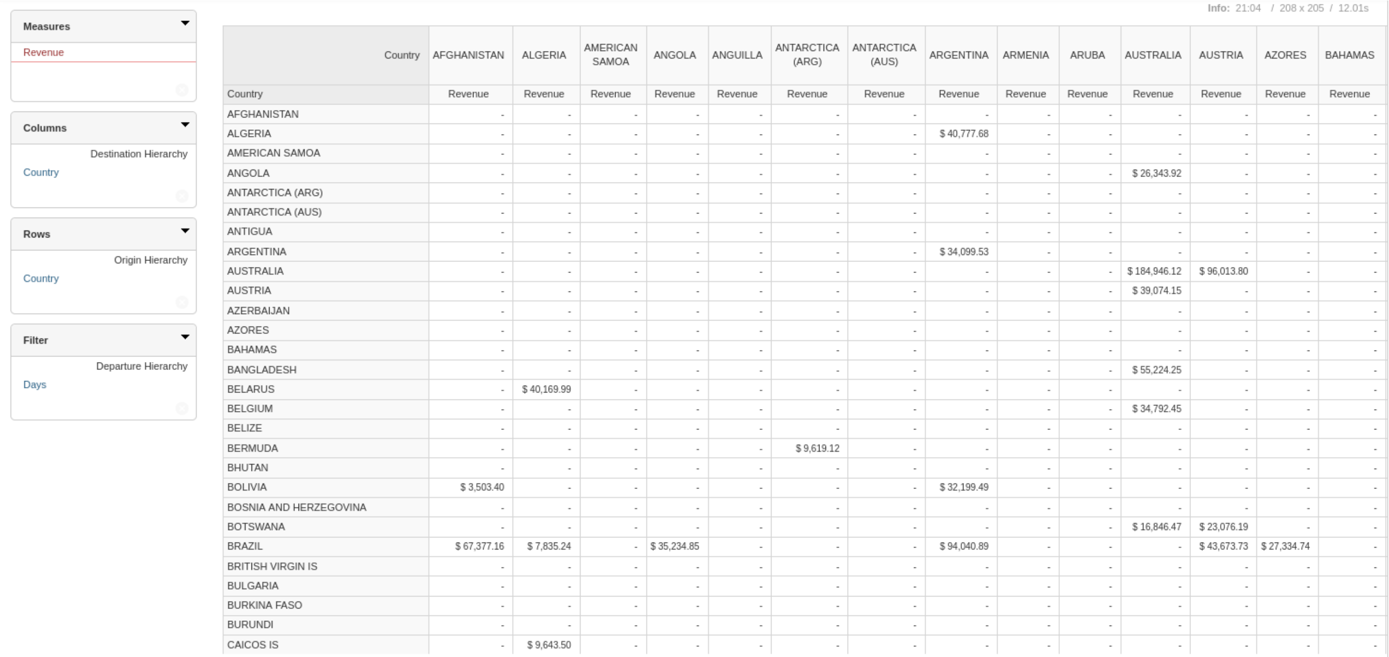
Months

Filter

	Months	Jun	Jul	Aug
Type	Months	Bookings	Bookings	Bookings
6	Jun	400,251	5,637	-
	Jul	-	403,462	5,273
18	Jun	235,757	3,324	-
	Jul	-	246,377	3,551
21	Jun	183,671	2,589	-
	Jul	-	189,362	2,534
	Aug	-	-	18
38	Jun	101,738	1,418	-
	Jul	-	106,392	1,701
	Aug	-	-	9
40	Jun	40,540	556	-
	Jul	-	41,693	512
41	Jun	58,249	770	-
	Jul	-	60,229	859
48	Jun	70,907	1,137	-
	Jul	-	73,456	968
60	Jun	220,202	3,451	-
	Jul	-	230,522	3,297
	Aug	-	-	18
75	Jun	50,143	700	-
	Jul	-	51,798	615
	Aug	-	-	11
228	Jun	78,211	963	-
	Jul	-	79,969	1,154
232	Jun	27,997	420	-
	Jul	-	28,914	427

Money spent/gained on flights between countries.

(On the 10 days with highest revenue – filter option.)



Measures

Revenue

Columns

Destination Hierarchy

Country

Rows

Origin Hierarchy

Country

Filter

Departure Hierarchy

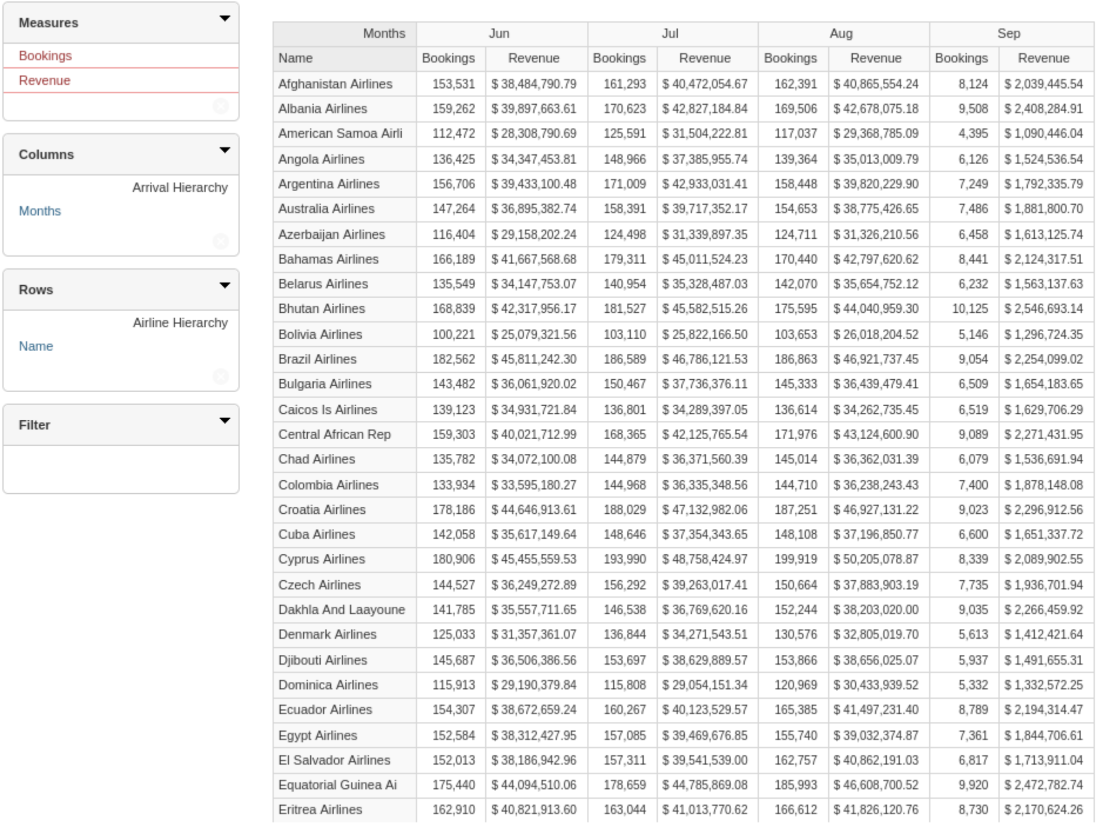
Days

Info: 21:04 / 208 x 205 / 12.01s

Country	AFGHANISTAN	ALGERIA	AMERICAN SAMOA	ANGOLA	ANGUILLA	ANTARCTICA (ARG)	ANTARCTICA (AUS)	ARGENTINA	ARMENIA	ARUBA	AUSTRALIA	AUSTRIA	AZORES	BAHAMAS
Country	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue
AFGHANISTAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALGERIA	-	-	-	-	-	-	-	$ 40,777.68	-	-	-	-	-	-
AMERICAN SAMOA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANGOLA	-	-	-	-	-	-	-	-	-	-	$ 26,343.92	-	-	-
ANTARCTICA (ARG)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTARCTICA (AUS)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTIGUA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ARGENTINA	-	-	-	-	-	-	-	$ 34,099.53	-	-	-	-	-	-
AUSTRALIA	-	-	-	-	-	-	-	-	-	-	$ 184,946.12	$ 96,013.80	-	-
AUSTRIA	-	-	-	-	-	-	-	-	-	-	$ 39,074.15	-	-	-
AZERBAIJAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AZORES	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BAHAMAS	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BANGLADESH	-	-	-	-	-	-	-	-	-	-	$ 55,224.25	-	-	-
BELARUS	-	$ 40,169.99	-	-	-	-	-	-	-	-	-	-	-	-
BELGIUM	-	-	-	-	-	-	-	-	-	-	$ 34,792.45	-	-	-
BELIZE	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BERMUDA	-	-	-	-	-	$ 9,619.12	-	-	-	-	-	-	-	-
BHUTAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BOLIVIA	$ 3,503.40	-	-	-	-	-	-	$ 32,199.49	-	-	-	-	-	-
BOSNIA AND HERZEGOVINA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BOTSWANA	-	-	-	-	-	-	-	-	-	-	$ 16,846.47	$ 23,076.19	-	-
BRAZIL	$ 67,377.16	$ 7,835.24	-	$ 35,234.85	-	-	-	$ 94,040.89	-	-	-	$ 43,673.73	$ 27,334.74	-
BRITISH VIRGIN IS	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BULGARIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BURKINA FASO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BURUNDI	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CAICOS IS	-	$ 9,643.50	-	-	-	-	-	-	-	-	-	-	-	-

airports-large-extra.sql

Passengers and revenue by airline and month.



Measures

Bookings

Revenue

Columns

Arrival Hierarchy

Months

Rows

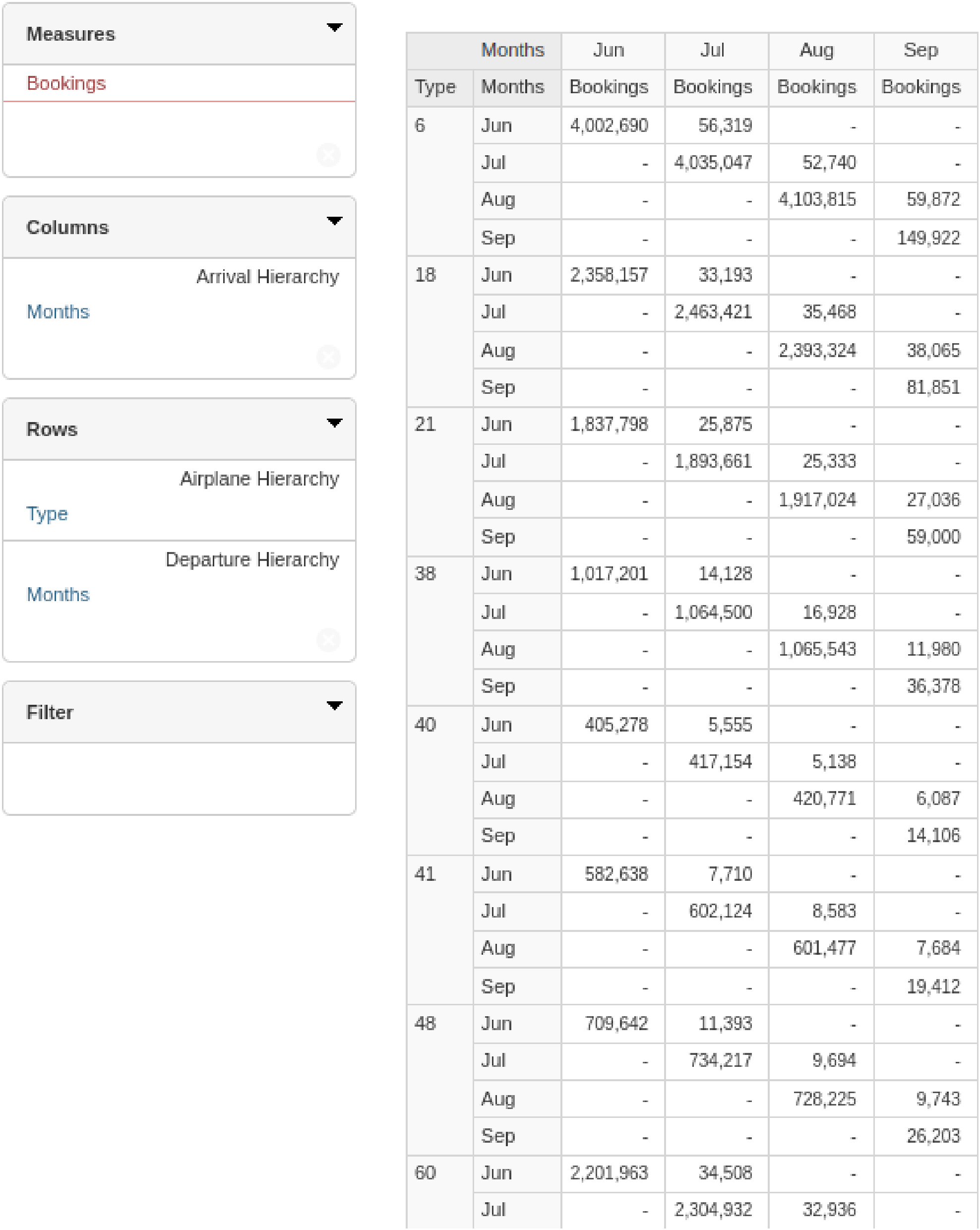
Airline Hierarchy

Name

Filter

Months	Jun		Jul		Aug		Sep	
Name	Bookings	Revenue	Bookings	Revenue	Bookings	Revenue	Bookings	Revenue
Afghanistan Airlines	153,531	$ 38,484,790.79	161,293	$ 40,472,054.67	162,391	$ 40,865,554.24	8,124	$ 2,039,445.54
Albania Airlines	159,262	$ 39,897,663.61	170,623	$ 42,827,184.84	169,506	$ 42,678,075.18	9,508	$ 2,408,284.91
American Samoa Airli	112,472	$ 28,308,790.69	125,591	$ 31,504,222.81	117,037	$ 29,368,785.09	4,395	$ 1,090,446.04
Angola Airlines	136,425	$ 34,347,453.81	148,966	$ 37,385,955.74	139,364	$ 35,013,009.79	6,126	$ 1,524,536.54
Argentina Airlines	156,706	$ 39,433,100.48	171,009	$ 42,933,031.41	158,448	$ 39,820,229.90	7,249	$ 1,792,335.79
Australia Airlines	147,264	$ 36,895,382.74	158,391	$ 39,717,352.17	154,653	$ 38,775,426.65	7,486	$ 1,881,800.70
Azerbaijan Airlines	116,404	$ 29,158,202.24	124,498	$ 31,339,897.35	124,711	$ 31,326,210.56	6,458	$ 1,613,125.74
Bahamas Airlines	166,189	$ 41,667,568.68	179,311	$ 45,011,524.23	170,440	$ 42,797,620.62	8,441	$ 2,124,317.51
Belarus Airlines	135,549	$ 34,147,753.07	140,954	$ 35,328,487.03	142,070	$ 35,654,752.12	6,232	$ 1,563,137.63
Bhutan Airlines	168,839	$ 42,317,956.17	181,527	$ 45,582,515.26	175,595	$ 44,040,959.30	10,125	$ 2,546,693.14
Bolivia Airlines	100,221	$ 25,079,321.56	103,110	$ 25,822,166.50	103,653	$ 26,018,204.52	5,146	$ 1,296,724.35
Brazil Airlines	182,562	$ 45,811,242.30	186,589	$ 46,786,121.53	186,863	$ 46,921,737.45	9,054	$ 2,254,099.02
Bulgaria Airlines	143,482	$ 36,061,920.02	150,467	$ 37,736,376.11	145,333	$ 36,439,479.41	6,509	$ 1,654,183.65
Caicos Is Airlines	139,123	$ 34,931,721.84	136,801	$ 34,289,397.05	136,614	$ 34,262,735.45	6,519	$ 1,629,706.29
Central African Rep	159,303	$ 40,021,712.99	168,365	$ 42,125,765.54	171,976	$ 43,124,600.90	9,089	$ 2,271,431.95
Chad Airlines	135,782	$ 34,072,100.08	144,879	$ 36,371,560.39	145,014	$ 36,362,031.39	6,079	$ 1,536,691.94
Colombia Airlines	133,934	$ 33,595,180.27	144,968	$ 36,335,348.56	144,710	$ 36,238,243.43	7,400	$ 1,878,148.08
Croatia Airlines	178,186	$ 44,646,913.61	188,029	$ 47,132,982.06	187,251	$ 46,927,131.22	9,023	$ 2,296,912.56
Cuba Airlines	142,058	$ 35,617,149.64	148,646	$ 37,354,343.65	148,108	$ 37,196,850.77	6,600	$ 1,651,337.72
Cyprus Airlines	180,906	$ 45,455,559.53	193,990	$ 48,758,424.97	199,919	$ 50,205,078.87	8,339	$ 2,089,902.55
Czech Airlines	144,527	$ 36,249,272.89	156,292	$ 39,263,017.41	150,664	$ 37,883,903.19	7,735	$ 1,936,701.94
Dakhla And Laayoune	141,785	$ 35,557,711.65	146,538	$ 36,769,620.16	152,244	$ 38,203,020.00	9,035	$ 2,266,459.92
Denmark Airlines	125,033	$ 31,357,361.07	136,844	$ 34,271,543.51	130,576	$ 32,805,019.70	5,613	$ 1,412,421.64
Djibouti Airlines	145,687	$ 36,506,386.56	153,697	$ 38,629,889.57	153,866	$ 38,656,025.07	5,937	$ 1,491,655.31
Dominica Airlines	115,913	$ 29,190,379.84	115,808	$ 29,054,151.34	120,969	$ 30,433,939.52	5,332	$ 1,332,572.25
Ecuador Airlines	154,307	$ 38,672,659.24	160,267	$ 40,123,529.57	165,385	$ 41,497,231.40	8,789	$ 2,194,314.47
Egypt Airlines	152,584	$ 38,312,427.95	157,085	$ 39,469,676.85	155,740	$ 39,032,374.87	7,361	$ 1,844,706.61
El Salvador Airlines	152,013	$ 38,186,942.96	157,311	$ 39,541,539.00	162,757	$ 40,862,191.03	6,817	$ 1,713,911.04
Equatorial Guinea Ai	175,440	$ 44,094,510.06	178,659	$ 44,785,869.08	185,993	$ 46,608,700.52	9,920	$ 2,472,782.74
Eritrea Airlines	162,910	$ 40,821,913.60	163,044	$ 41,013,770.62	166,612	$ 41,826,120.76	8,730	$ 2,170,624.26

Airplane type and month of departure by month of arrival.
(2 airplane types departed in July and arrived in August.)



Measures

Bookings

Columns

Arrival Hierarchy

Months

Rows

Airplane Hierarchy

Type

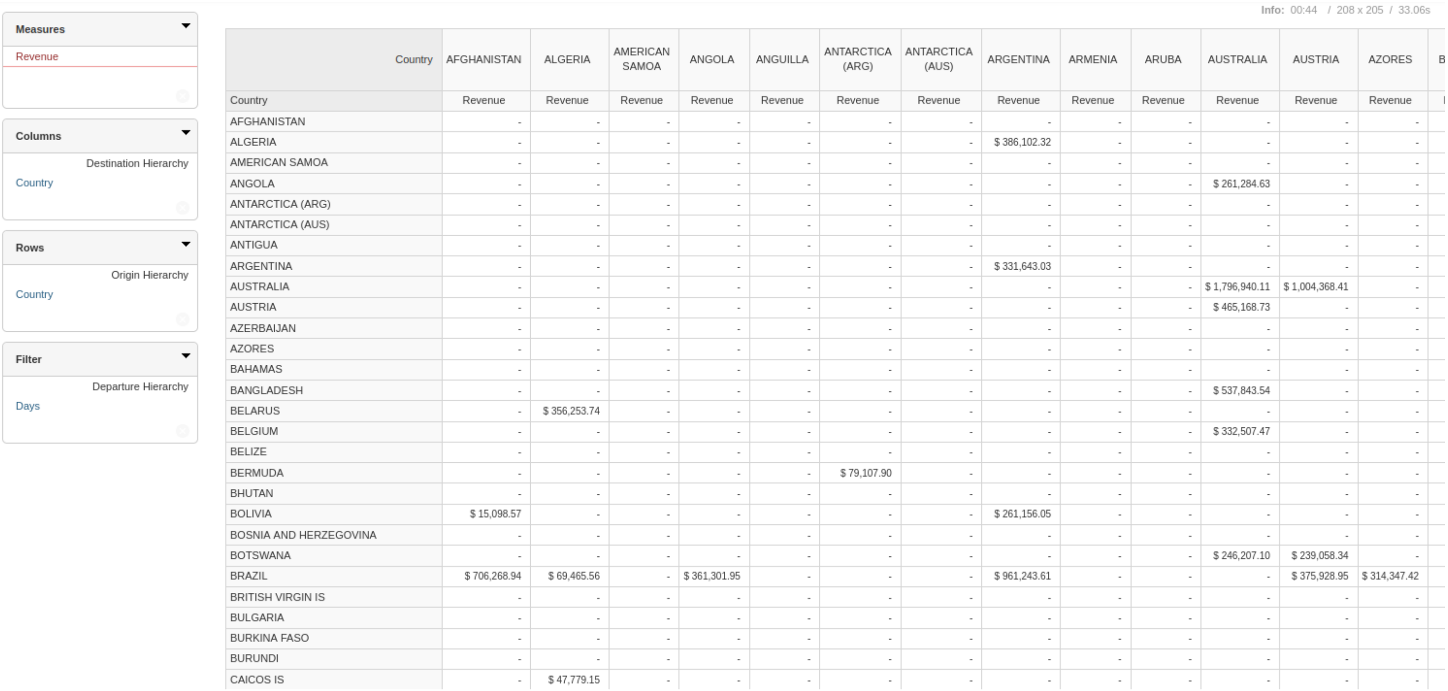
Departure Hierarchy

Months

Filter

	Months	Jun	Jul	Aug	Sep
Type	Months	Bookings	Bookings	Bookings	Bookings
6	Jun	4,002,690	56,319	-	-
	Jul	-	4,035,047	52,740	-
	Aug	-	-	4,103,815	59,872
	Sep	-	-	-	149,922
18	Jun	2,358,157	33,193	-	-
	Jul	-	2,463,421	35,468	-
	Aug	-	-	2,393,324	38,065
	Sep	-	-	-	81,851
21	Jun	1,837,798	25,875	-	-
	Jul	-	1,893,661	25,333	-
	Aug	-	-	1,917,024	27,036
	Sep	-	-	-	59,000
38	Jun	1,017,201	14,128	-	-
	Jul	-	1,064,500	16,928	-
	Aug	-	-	1,065,543	11,980
	Sep	-	-	-	36,378
40	Jun	405,278	5,555	-	-
	Jul	-	417,154	5,138	-
	Aug	-	-	420,771	6,087
	Sep	-	-	-	14,106
41	Jun	582,638	7,710	-	-
	Jul	-	602,124	8,583	-
	Aug	-	-	601,477	7,684
	Sep	-	-	-	19,412
48	Jun	709,642	11,393	-	-
	Jul	-	734,217	9,694	-
	Aug	-	-	728,225	9,743
	Sep	-	-	-	26,203
60	Jun	2,201,963	34,508	-	-
	Jul	-	2,304,932	32,936	-

Money spent/gained on flights between countries.
(On the 10 days with highest revenue – filter option.)



Measures
Revenue

Columns
Destination Hierarchy
Country

Rows
Origin Hierarchy
Country

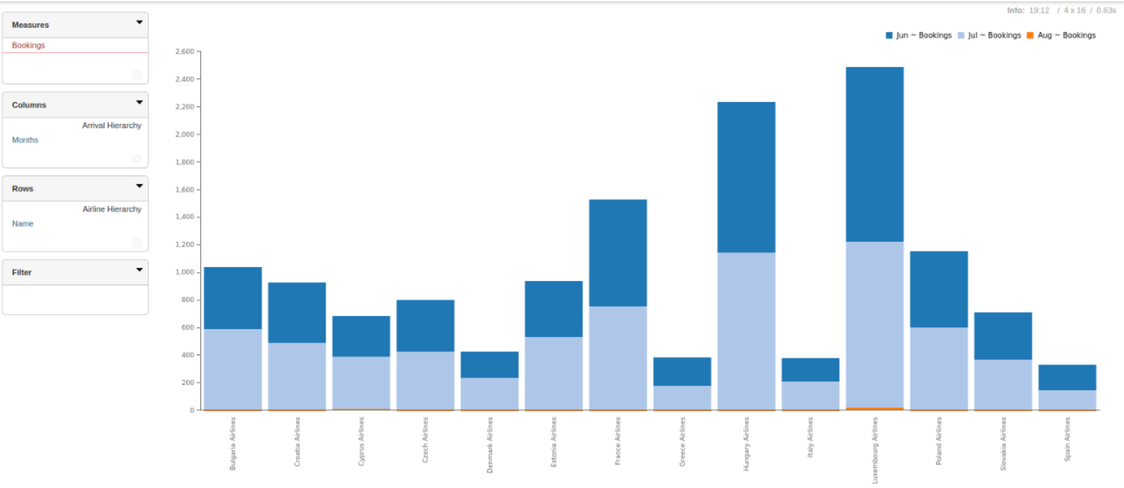
Filter
Departure Hierarchy
Days

Info: 00:44 / 208 x 205 / 33.06s

Country	AFGHANISTAN	ALGERIA	AMERICAN SAMOA	ANGOLA	ANGUILLA	ANTARCTICA (ARG)	ANTARCTICA (AUS)	ARGENTINA	ARMENIA	ARUBA	AUSTRALIA	AUSTRIA	AZORES
Country	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue
AFGHANISTAN	-	-	-	-	-	-	-	-	-	-	-	-	-
ALGERIA	-	-	-	-	-	-	-	$ 386,102.32	-	-	-	-	-
AMERICAN SAMOA	-	-	-	-	-	-	-	-	-	-	-	-	-
ANGOLA	-	-	-	-	-	-	-	-	-	-	$ 261,284.63	-	-
ANTARCTICA (ARG)	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTARCTICA (AUS)	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTIGUA	-	-	-	-	-	-	-	-	-	-	-	-	-
ARGENTINA	-	-	-	-	-	-	-	$ 331,643.03	-	-	-	-	-
AUSTRALIA	-	-	-	-	-	-	-	-	-	-	$ 1,796,940.11	$ 1,004,368.41	-
AUSTRIA	-	-	-	-	-	-	-	-	-	-	$ 465,168.73	-	-
AZERBAIJAN	-	-	-	-	-	-	-	-	-	-	-	-	-
AZORES	-	-	-	-	-	-	-	-	-	-	-	-	-
BAHAMAS	-	-	-	-	-	-	-	-	-	-	-	-	-
BANGLADESH	-	-	-	-	-	-	-	-	-	-	$ 537,843.54	-	-
BELARUS	-	$ 356,253.74	-	-	-	-	-	-	-	-	-	-	-
BELGIUM	-	-	-	-	-	-	-	-	-	-	$ 332,507.47	-	-
BELIZE	-	-	-	-	-	-	-	-	-	-	-	-	-
BERMUDA	-	-	-	-	-	$ 79,107.90	-	-	-	-	-	-	-
BHUTAN	-	-	-	-	-	-	-	-	-	-	-	-	-
BOLIVIA	$ 15,098.57	-	-	-	-	-	-	$ 261,156.05	-	-	-	-	-
BOSNIA AND HERZEGOVINA	-	-	-	-	-	-	-	-	-	-	-	-	-
BOTSWANA	-	-	-	-	-	-	-	-	-	-	$ 246,207.10	$ 239,058.34	-
BRAZIL	$ 706,268.94	$ 69,465.56	-	$ 361,301.95	-	-	-	$ 961,243.61	-	-	-	$ 375,928.95	$ 314,347.42
BRITISH VIRGIN IS	-	-	-	-	-	-	-	-	-	-	-	-	-
BULGARIA	-	-	-	-	-	-	-	-	-	-	-	-	-
BURKINA FASO	-	-	-	-	-	-	-	-	-	-	-	-	-
BURUNDI	-	-	-	-	-	-	-	-	-	-	-	-	-
CAICOS IS	-	$ 47,779.15	-	-	-	-	-	-	-	-	-	-	-

Comparisons

airports.sql



Measures: Bookings

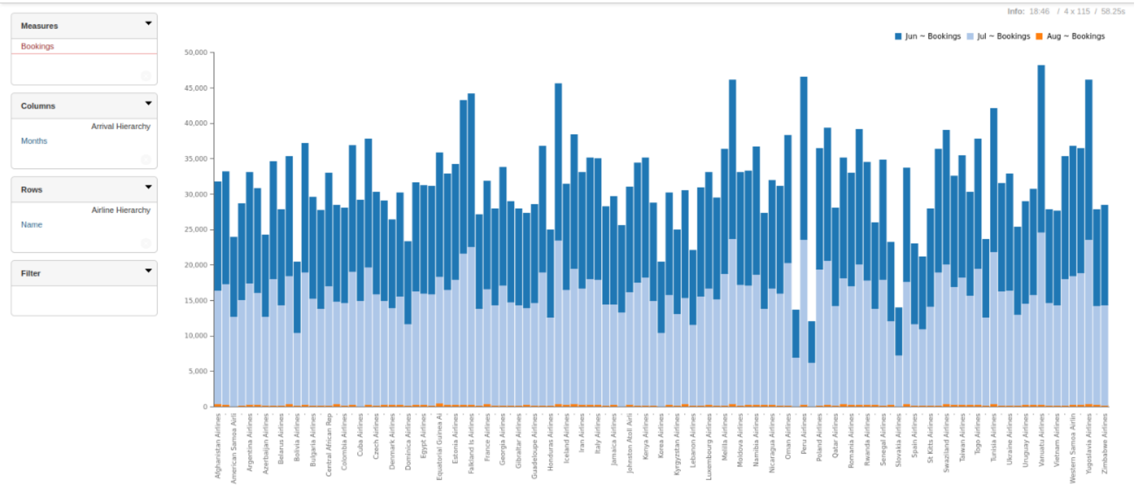
Columns: Arrival Hierarchy — Months

Rows: Airline Hierarchy — Name

Filter

Info: 19:12 / 4 x 16 / 0.63s

airports-large.sql



Measures: Bookings

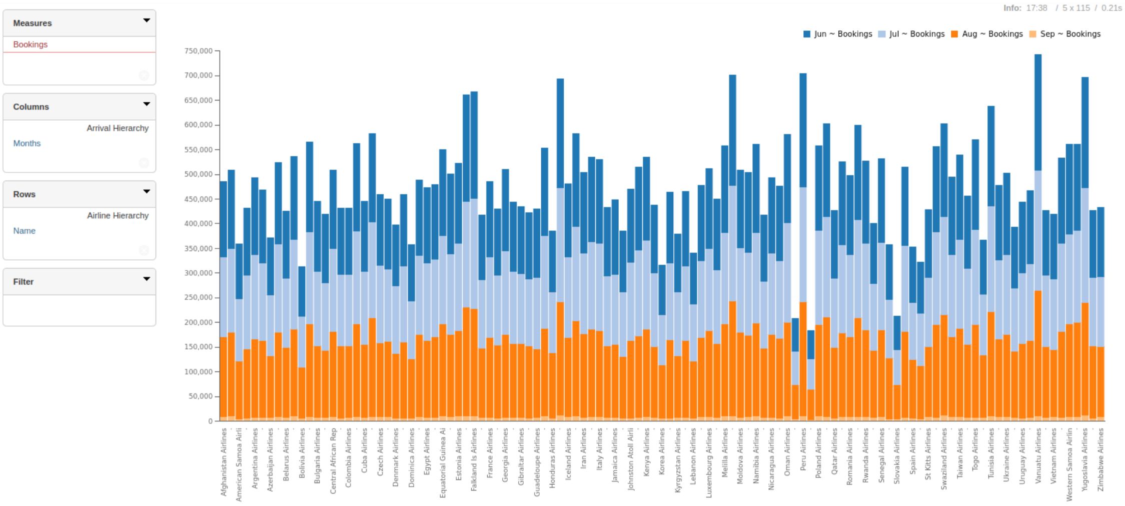
Columns: Arrival Hierarchy — Months

Rows: Airline Hierarchy — Name

Filter

Info: 18:46 / 4 x 115 / 58.25s

airports-large-extra.sql



Measures: Bookings

Columns: Arrival Hierarchy — Months

Rows: Airline Hierarchy — Name

Filter

Info: 17:38 / 5 x 115 / 0.21s

We decided to compare the three datasets using the first query from exercise 5 (*Passengers and revenue by airline and month*), just with the bookings measure.

On an overall view, we can see the number of airlines growing considerably from the first to the second graphs, and then the appearance of a new month between the second and third ones.

Despite not comparing the number of airports and airplanes stored in the data warehouse, just by looking at the scales of the chosen graphs, we get a good idea of how the problem (manage information about flights) scales with the three *.sql*.

About the second query (*Airplane type and month of departure by month of arrival*), it only states the curiosity of the flights at the end of the month, which depart at one month and arrive at the other. The table only gets more lines as we increase the problem (can’t be seen by the picture).

In the third query (*Money spent/gained on flights between countries*), we are able to see the scaling of big datasets, because between the first and the second, a considerable number of airports were introduced and the table became more sparse (a higher density of null values). At *airports-large-extra*, the number of airports barely changes (at least in the picture), but there are more flights between the same countries, as the table continues to be sparse and the money involved is higher.