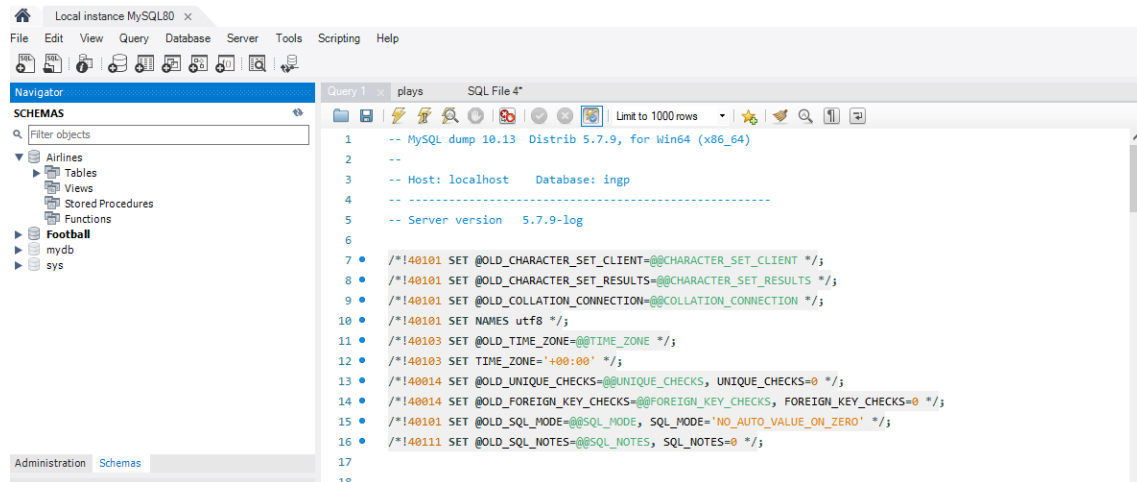


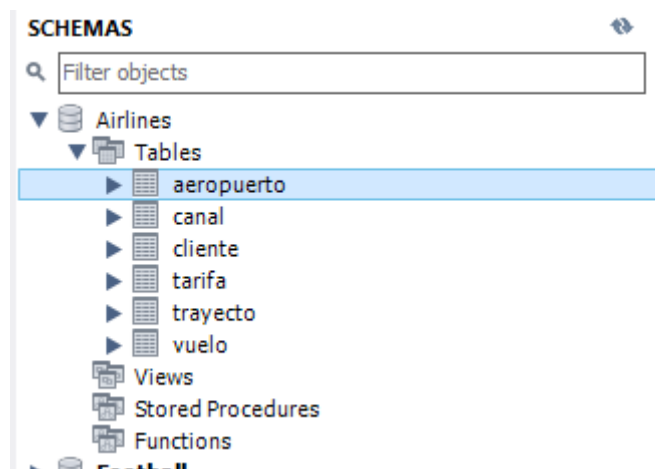
Task 2. Multidimensional Implementation

In this task I am going to show how I have implemented the multidimensional design of the Airlines database.

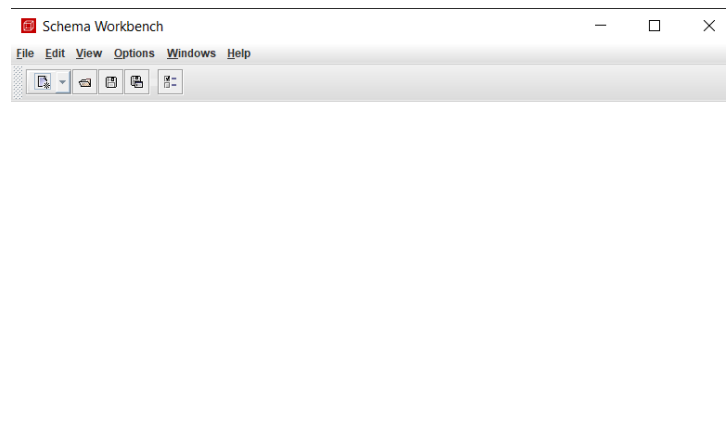
First, I have loaded the script given in campus virtual into the Airlines connection that I have created.



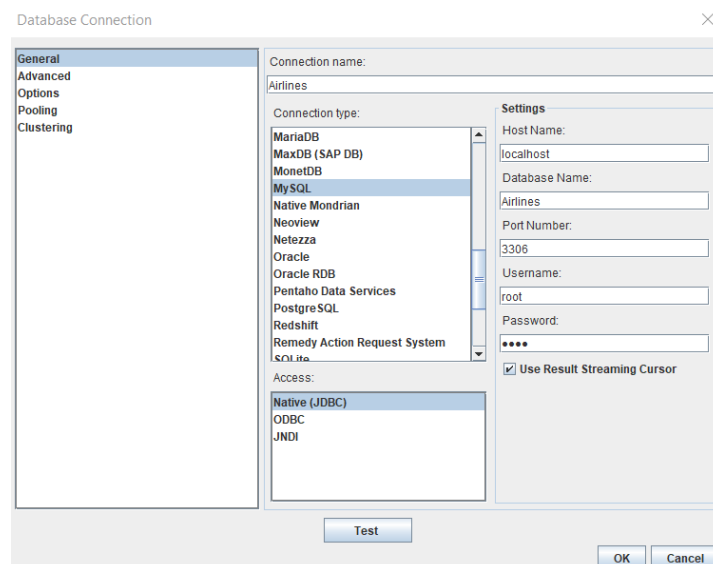
After deploying it the tables appear in the database.



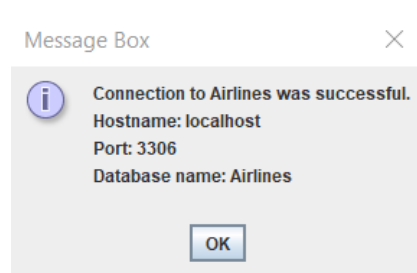
Now that the database is ready, I am going to open schema-workbench application to connect to the database and start my multidimensional design.



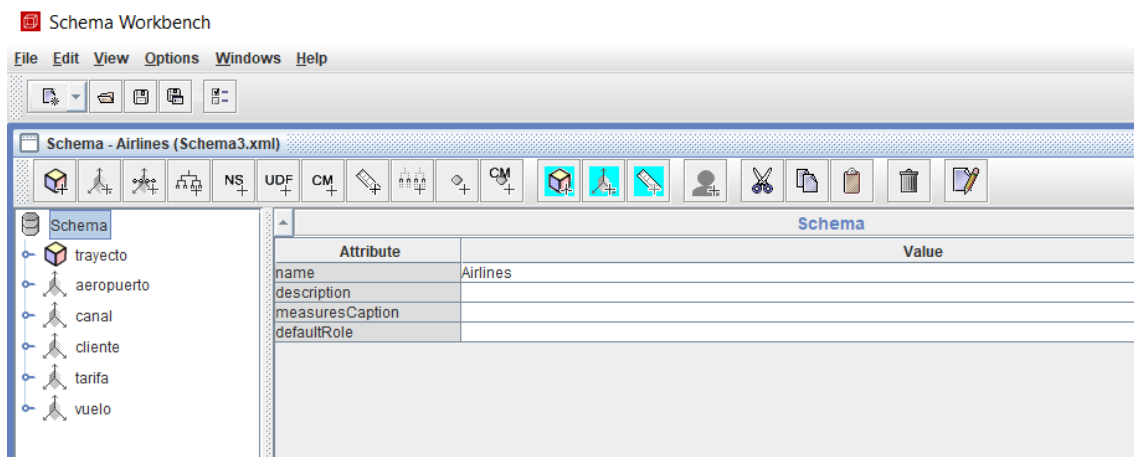
Once the program is opened, we have to connect to our database. We do that by clicking on options -> connection. In the windows that appears we have to put our database login data in order for the connection to work.



If we click on test we can see that the connection is successful. Now we can click on 'ok'.

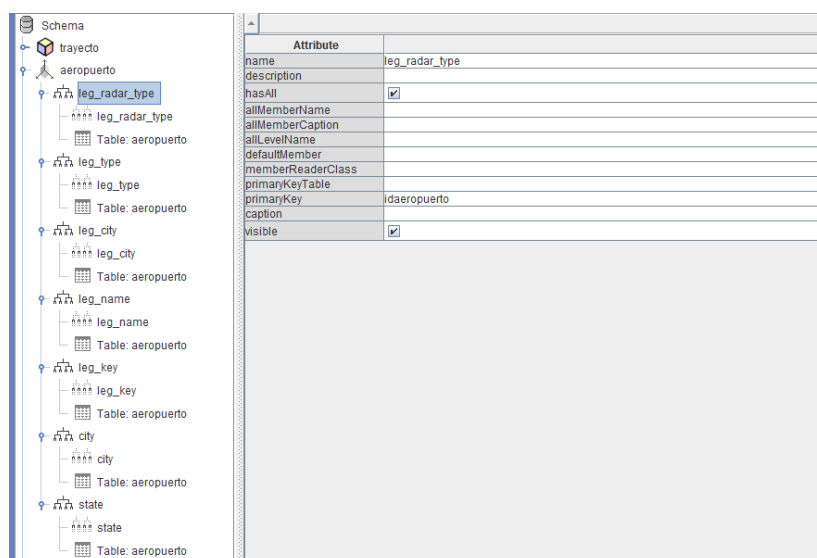


Now I am going to load the scheme I have implemented.

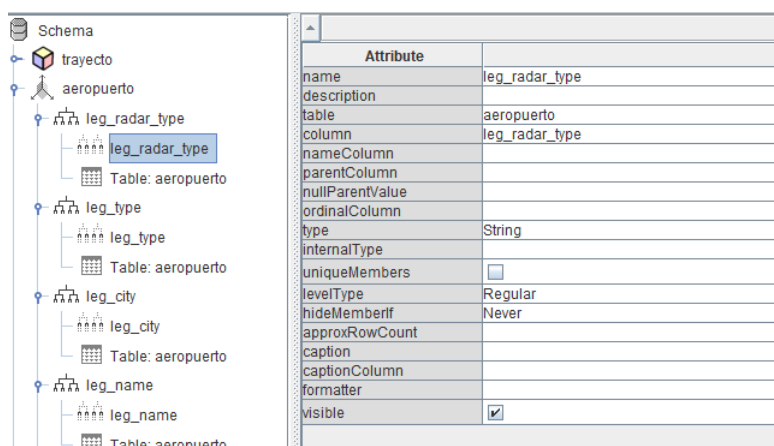


Here we can see the Airlines schema. It has ‘trayecto’, which is the fact table, as the cube of the schema and one dimension for each table in the Airlines database.

For the Airport dimension we have the hierarchies defined in task one this hierarchies all have “idaeropuerto” as primary key.



Inside the hierarchies we find the levels of each hierarchy in ‘leg_radar_type’ we have the column from ‘aeropuerto’ that represents it.



For 'leg_type'

Schema

- trayecto
 - aeropuerto
 - leg_radar_type
 - leg_radar_type
 - Table: aeropuerto
 - leg_type
 - leg_type
 - Table: aeropuerto
 - leg_city
 - leg_city
 - Table: aeropuerto
 - leg_name
 - leg_name
 - Table: aeropuerto
 - leg_key
 - leg_key
 - Table: aeropuerto

Attribute	
name	leg_type
description	
table	aeropuerto
column	leg_type
nameColumn	
parentColumn	
nullParentValue	
ordinalColumn	
type	String
internalType	
uniqueMembers	<input type="checkbox"/>
levelType	Regular
hideMemberIf	Never
approxRowCount	
caption	
captionColumn	
formatter	
visible	<input checked="" type="checkbox"/>

For 'leg_city'

Schema - Airlines (Schema3.xml)*

- trayecto
 - aeropuerto
 - leg_radar_type
 - leg_radar_type
 - Table: aeropuerto
 - leg_type
 - leg_type
 - Table: aeropuerto
 - leg_city
 - leg_city
 - Table: aeropuerto
 - leg_name
 - leg_name
 - Table: aeropuerto

Attribute	
name	leg_city
description	
table	aeropuerto
column	leg_city
nameColumn	
parentColumn	
nullParentValue	
ordinalColumn	
type	String
internalType	
uniqueMembers	<input type="checkbox"/>
levelType	Regular
hideMemberIf	Never
approxRowCount	
caption	
captionColumn	
formatter	
visible	<input checked="" type="checkbox"/>

For 'leg_name'

Schema

- trayecto
 - aeropuerto
 - leg_radar_type
 - leg_radar_type
 - Table: aeropuerto
 - leg_type
 - leg_type
 - Table: aeropuerto
 - leg_city
 - leg_city
 - Table: aeropuerto
 - leg_name
 - leg_name
 - Table: aeropuerto
 - leg_key
 - leg_key
 - Table: aeropuerto

Attribute	
name	leg_name
description	
table	aeropuerto
column	leg_name
nameColumn	
parentColumn	
nullParentValue	
ordinalColumn	
type	String
internalType	
uniqueMembers	<input type="checkbox"/>
levelType	Regular
hideMemberIf	Never
approxRowCount	
caption	
captionColumn	
formatter	
visible	<input checked="" type="checkbox"/>

For 'leg_key'

Schema

trayecto

aeropuerto

leg_radar_type

leg_radar_type

Table: aeropuerto

leg_type

leg_type

Table: aeropuerto

leg_city

leg_city

Table: aeropuerto

leg_name

leg_name

Table: aeropuerto

leg_key

leg_key

Attribute	
name	leg_key
description	
table	aeropuerto
column	leg_key
nameColumn	
parentColumn	
nullParentValue	
ordinalColumn	
type	Integer
internalType	
uniqueMembers	<input type="checkbox"/>
levelType	Regular
hideMemberIf	Never
approxRowCount	
caption	
captionColumn	
formatter	
visible	<input checked="" type="checkbox"/>

For "city

trayecto

aeropuerto

leg_radar_type

leg_radar_type

Table: aeropuerto

leg_type

leg_type

Table: aeropuerto

leg_city

leg_city

Table: aeropuerto

leg_name

leg_name

Table: aeropuerto

leg_key

leg_key

Table: aeropuerto

city

city

Table: aeropuerto

Attribute	
name	city
description	
table	aeropuerto
column	city
nameColumn	
parentColumn	
nullParentValue	
ordinalColumn	
type	String
internalType	
uniqueMembers	<input type="checkbox"/>
levelType	Regular
hideMemberIf	Never
approxRowCount	
caption	
captionColumn	
formatter	
visible	<input checked="" type="checkbox"/>

For 'state'

Schema

trayecto

aeropuerto

leg_radar_type

leg_radar_type

Table: aeropuerto

leg_type

leg_type

Table: aeropuerto

leg_city

leg_city

Table: aeropuerto

leg_name

leg_name

Table: aeropuerto

leg_key

leg_key

Table: aeropuerto

city

city

Table: aeropuerto

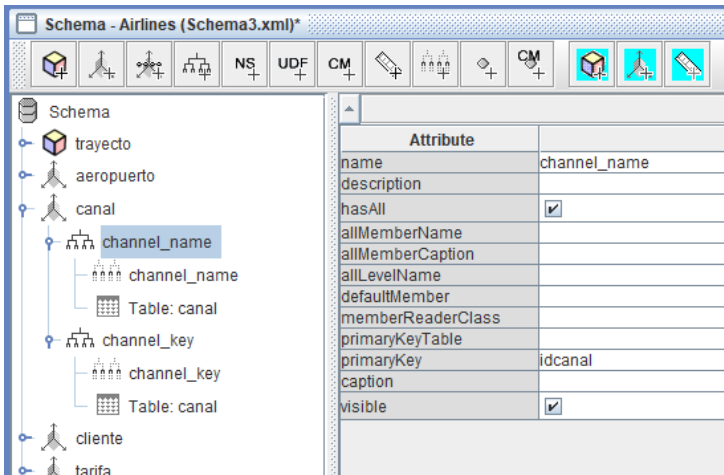
state

state

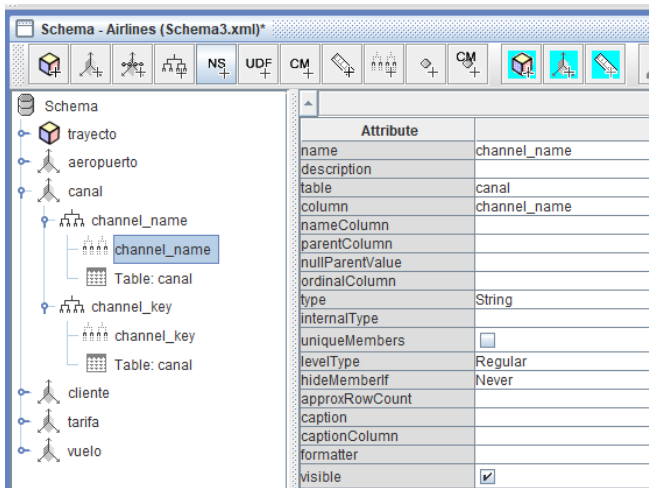
Table: aeropuerto

Attribute	
name	state
description	
table	aeropuerto
column	state
nameColumn	
parentColumn	
nullParentValue	
ordinalColumn	
type	String
internalType	
uniqueMembers	<input type="checkbox"/>
levelType	Regular
hideMemberIf	Never
approxRowCount	
caption	
captionColumn	
formatter	
visible	<input checked="" type="checkbox"/>

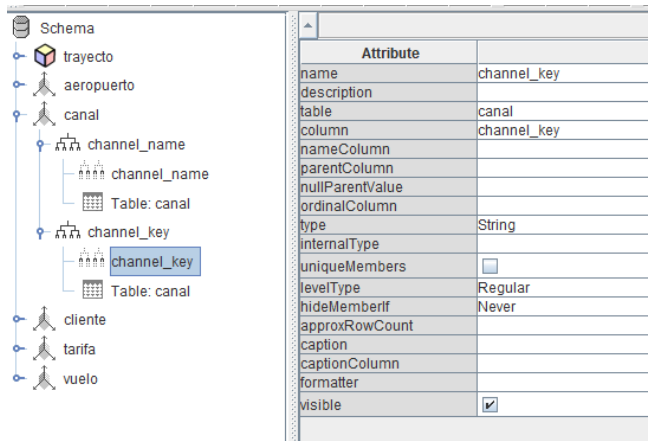
In Canal dimension we have to hierarchies one for the 'channel_name' and another one for 'channel_key'. Both of them only have one level.



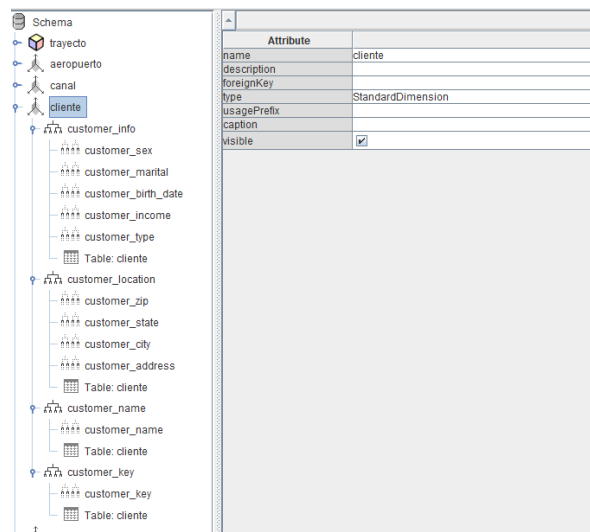
For the 'channel_name' we have



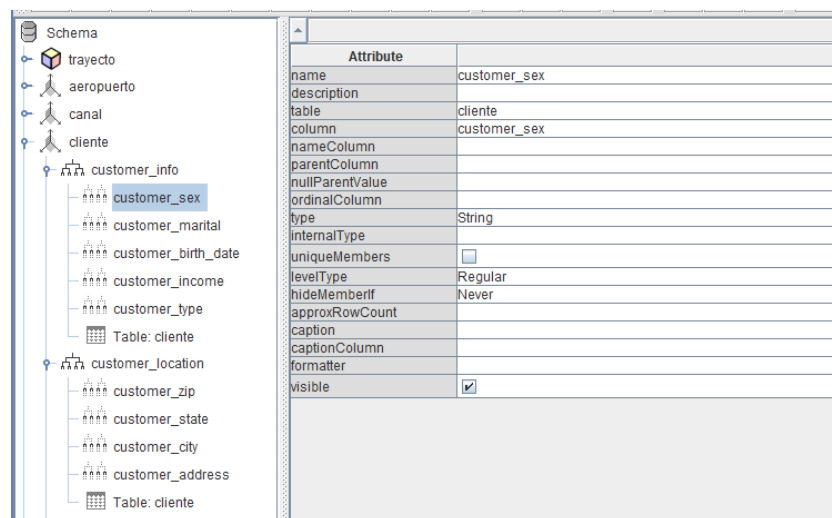
And for the 'channel_key'



For the 'Cliente' dimension I have done the same.



Here we have the 'customer_info' hierarchy who has the 'idcliente' as primary key and inside we have the information level, 'customer_sex' that has the 'customer_sex' column in cliente table.



And the rest levels are done in the same way. In 'customer_martial' I have assigned the 'customer_martial' column etc...

In customer location the same thing. Each level of the hierarchy has assigned the column it represents.

Attribute	
name	customer_zip
description	
table	cliente
column	customer_zip
nameColumn	
parentColumn	
nullParentValue	
ordinalColumn	
type	Numeric
internalType	
uniqueMembers	<input type="checkbox"/>
levelType	Regular
hideMemberIf	Never
approxRowCount	
caption	
captionColumn	
formatter	
visible	<input checked="" type="checkbox"/>

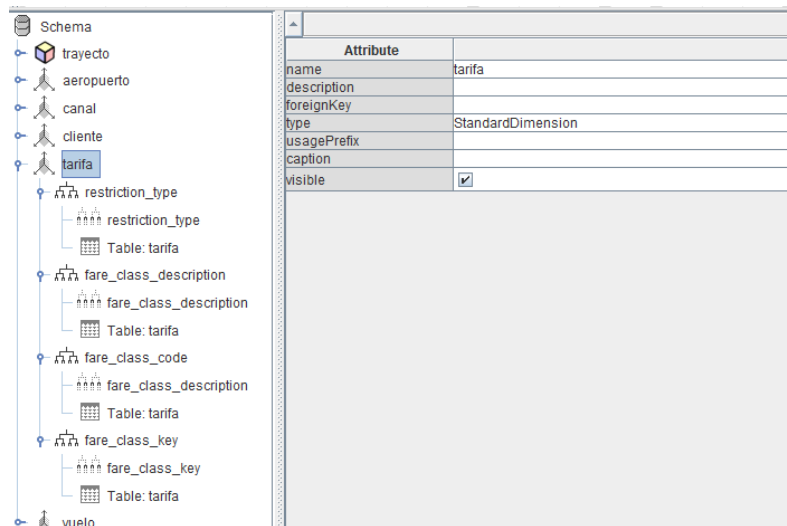
In 'customer_name' we have the following thing.

Attribute	
name	customer_name
description	
table	cliente
column	customer_name
nameColumn	
parentColumn	
nullParentValue	
ordinalColumn	
type	String
internalType	
uniqueMembers	<input type="checkbox"/>
levelType	Regular
hideMemberIf	Never
approxRowCount	
caption	
captionColumn	
formatter	
visible	<input checked="" type="checkbox"/>

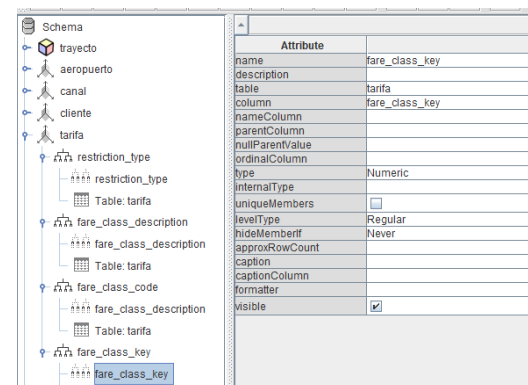
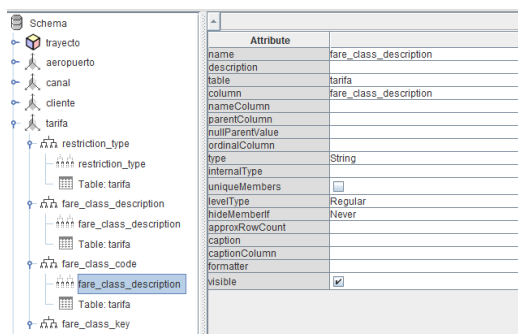
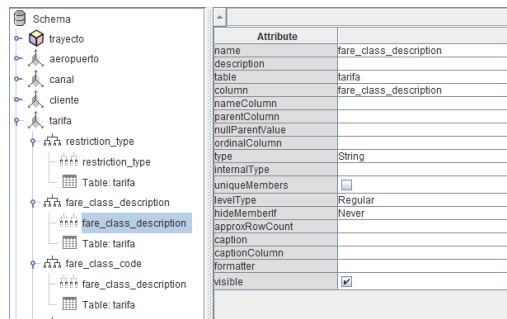
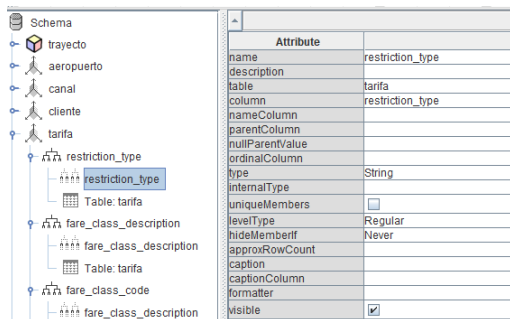
And in 'customer_key' this.

Attribute	
name	customer_key
description	
table	cliente
column	customer_key
nameColumn	
parentColumn	
nullParentValue	
ordinalColumn	
type	Numeric
internalType	
uniqueMembers	<input type="checkbox"/>
levelType	Regular
hideMemberIf	Never
approxRowCount	
caption	
captionColumn	
formatter	
visible	<input checked="" type="checkbox"/>

For the 'tarifa' dimension we find a hierarchy for each attribute of the table.



It has been done as the ones explained before



The last dimension is 'vuelo'.

In this dimension we find a hierarchy for the flight information that contains all the information about the flight. For example, the coach capacity.

The screenshot shows a schema editor with a tree view on the left and an attribute details panel on the right. The tree view shows a hierarchy starting from 'trayecto', followed by 'vuelo', 'vuelo_info', and finally 'coach_capacity'. The attribute details panel for 'coach_capacity' shows the following properties:

Attribute	
name	coach_capacity
description	
table	vuelo
column	coach_capacity
nameColumn	
parentColumn	
nullParentValue	
ordinalColumn	
type	Numeric
internalType	
uniqueMembers	<input type="checkbox"/>
levelType	Regular
hideMemberif	Never
approxRowCount	
caption	
captionColumn	
formatter	
visible	<input checked="" type="checkbox"/>

All the levels are designed the same way.

The next hierarchy is the arrival.

The screenshot shows a schema editor with a tree view on the left and an attribute details panel on the right. The tree view shows a hierarchy starting from 'trayecto', followed by 'vuelo', 'vuelo_info', 'sched_arrival', and finally 'sched_arrival'. The attribute details panel for 'sched_arrival' shows the following properties:

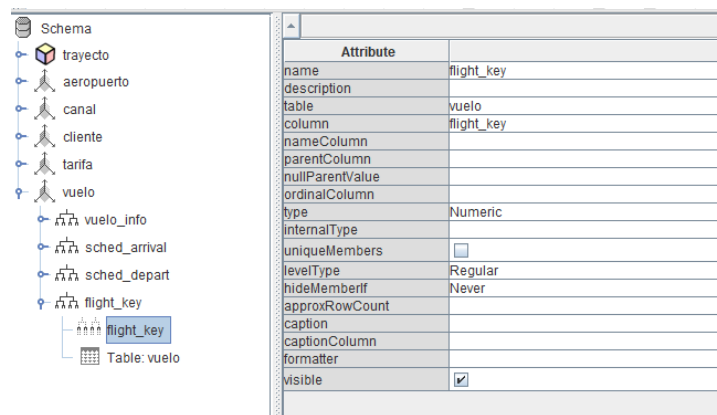
Attribute	
name	sched_arrival
description	
table	vuelo
column	sched_arrival
nameColumn	
parentColumn	
nullParentValue	
ordinalColumn	
type	String
internalType	
uniqueMembers	<input type="checkbox"/>
levelType	Regular
hideMemberif	Never
approxRowCount	
caption	
captionColumn	
formatter	
visible	<input checked="" type="checkbox"/>

The Depart

The screenshot shows a schema editor with a tree view on the left and an attribute details panel on the right. The tree view shows a hierarchy starting from 'trayecto', followed by 'vuelo', 'vuelo_info', 'sched_depart', and finally 'sched_depart'. The attribute details panel for 'sched_depart' shows the following properties:

Attribute	
name	sched_depart
description	
table	vuelo
column	sched_depart
nameColumn	
parentColumn	
nullParentValue	
ordinalColumn	
type	String
internalType	
uniqueMembers	<input type="checkbox"/>
levelType	Regular
hideMemberif	Never
approxRowCount	
caption	
captionColumn	
formatter	
visible	<input checked="" type="checkbox"/>

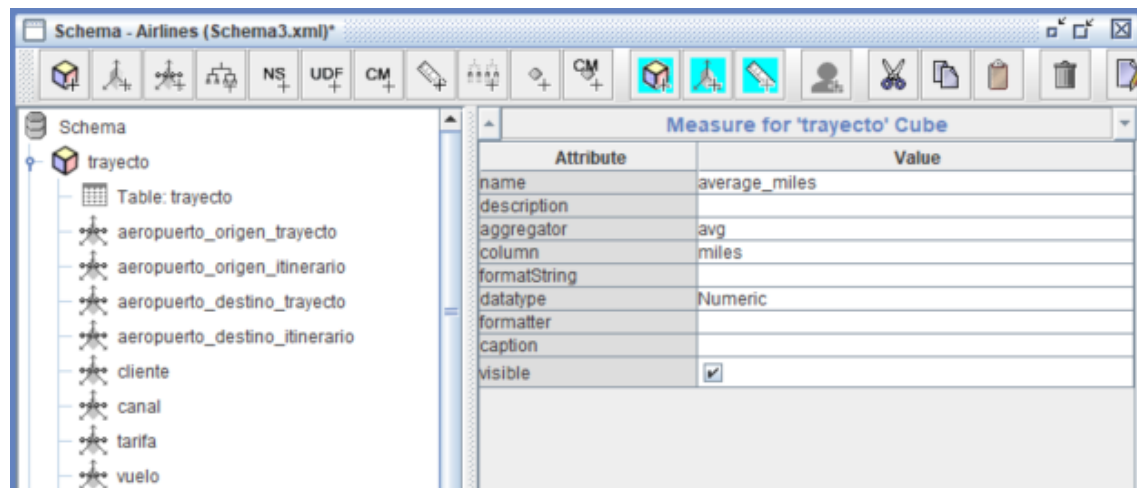
And the flight key



Attribute	
name	flight_key
description	
table	vuelo
column	flight_key
nameColumn	
parentColumn	
nullParentValue	
ordinalColumn	
type	Numeric
internalType	
uniqueMembers	<input type="checkbox"/>
levelType	Regular
hideMemberIf	Never
approxRowCount	
caption	
captionColumn	
formatter	
visible	<input checked="" type="checkbox"/>

Once the dimensions are clear we can start by explaining the cube.

In the cube we find the dimension usages of our dimensions.



Measure for 'trayecto' Cube	
Attribute	Value
name	average_miles
description	
aggregator	avg
column	miles
formatString	
datatype	Numeric
formatter	
caption	
visible	<input checked="" type="checkbox"/>

These are 'aeropuerto_origen_trayecto' whose source is airport, and the foreign key is 'aeropuerto_origen_trayecto'.

'Aeropuerto_origen_itinerario' whose source is airport, and the foreign key is 'aeropuerto_origen_itinerario'.

We have 'aeropuerto_destino_trayecto' whose source is airport, and the foreign key is 'aeropuerto_destino_trayecto'.

And 'Aeropuerto_destino_itinerario' whose source is airport, and the foreign key is 'aeropuerto_destino_itinerario'.

We also have the dimension usage for 'cliente' whose source is 'cliente' and the foreign key is 'cliente' and the same for 'canal' (source: 'canal', foreign key: 'canal'), 'tarifa' (source: 'tarifa', foreign key: 'tarifa') and 'vuelo' (source: 'vuelo', foreign key: 'vuelo').

When it comes to the measures if have selected the following ones.

The screenshot shows a data modeling tool interface. On the left, a tree view under 'Schema' shows a table 'trayecto' with several dimensions: 'aeropuerto_origen_trayecto', 'aeropuerto_origen_itinerario', 'aeropuerto_destino_trayecto', 'aeropuerto_destino_itinerario', 'cliente', 'canal', 'tarifa', 'vuelo', and three measures: 'ticket_number', 'total_minutes_late', 'total_miles', 'total_fare', 'average_minutes_late', 'average_fare', and 'average_miles'. On the right, the 'Attribute' table for 'trayecto' is displayed.

Attribute	
name	canal
description	
foreignKey	
type	StandardDimension
usagePrefix	
caption	
visible	<input checked="" type="checkbox"/>

‘Ticket _number’ with a count aggregator so I can count the number of tickets per user.

The screenshot shows the same data modeling tool interface. The 'ticket_number' measure is now highlighted in the tree view. The 'Attribute' table on the right has been updated to reflect this selection.

Attribute	
name	ticket_number
description	
aggregator	count
column	ticket_number
formatString	
datatype	Numeric
formatter	
caption	
visible	<input checked="" type="checkbox"/>

‘Total_minutes_late’ with a sum aggregator so I can calculate the total delay.

The screenshot shows the same data modeling tool interface. The 'total_minutes_late' measure is now highlighted in the tree view. The 'Attribute' table on the right has been updated to reflect this selection.

Attribute	
name	total_minutes_late
description	
aggregator	sum
column	minutes_late
formatString	
datatype	Numeric
formatter	
caption	
visible	<input checked="" type="checkbox"/>

‘Average_minutes_late’ with an avg aggregator so I can calculate the average.

Schema

trayecto

Table: trayecto

aeropuerto_origen_trayecto

aeropuerto_origen_itinerario

aeropuerto_destino_trayecto

aeropuerto_destino_itinerario

cliente

canal

tarifa

vuelo

ticket_number

total_minutes_late

total_miles

total_fare

average_minutes_late

Attribute	
name	average_minutes_late
description	
aggregator	avg
column	minutes_late
formatString	
datatype	Numeric
formatter	
caption	
visible	<input checked="" type="checkbox"/>

The ‘total_miles’ with a sum aggregator and ‘average_miles’ with an avg aggregator.

Schema

trayecto

Table: trayecto

aeropuerto_origen_trayecto

aeropuerto_origen_itinerario

aeropuerto_destino_trayecto

aeropuerto_destino_itinerario

cliente

canal

tarifa

vuelo

ticket_number

total_minutes_late

total_miles

Attribute	
name	total_miles
description	
aggregator	sum
column	miles
formatString	
datatype	Numeric
formatter	
caption	
visible	<input checked="" type="checkbox"/>

Schema

trayecto

Table: trayecto

aeropuerto_origen_trayecto

aeropuerto_origen_itinerario

aeropuerto_destino_trayecto

aeropuerto_destino_itinerario

cliente

canal

tarifa

vuelo

ticket_number

total_minutes_late

total_miles

total_fare

Attribute	
name	average_miles
description	
aggregator	avg
column	miles
formatString	
datatype	Numeric
formatter	
caption	
visible	<input checked="" type="checkbox"/>

And the 'total_fare' with a sum aggregator as well as the 'average_fare' with an avg aggregator.

Schema

trayecto

Table: trayecto

aeropuerto_origen_trayecto

aeropuerto_origen_itinerario

aeropuerto_destino_trayecto

aeropuerto_destino_itinerario

cliente

canal

tarifa

vuelo

ticket_number

total_minutes_late

total_miles

total_fare

Attribute	
name	total_fare
description	
aggregator	sum
column	fare
formatString	
datatype	Numeric
formatter	
caption	
visible	<input checked="" type="checkbox"/>

Schema

trayecto

Table: trayecto

aeropuerto_origen_trayecto

aeropuerto_origen_itinerario

aeropuerto_destino_trayecto

aeropuerto_destino_itinerario

cliente

canal

tarifa

vuelo

ticket_number

total_minutes_late

total_miles

total_fare

average_minutes_late

average_fare

Attribute	
name	average_fare
description	
aggregator	avg
column	fare
formatString	
datatype	Numeric
formatter	
caption	
visible	<input checked="" type="checkbox"/>