AID-Project

I - Developing the data warehouse

1. Creation of the airports database

Once connected to the MySQL server, we execute the command to create the provided airport database: source airports.sql

2. Creation of the airports data warehouse

We create 4 dimension tables and 1 fact table into the data warehouse airports_dw:

- dim_airline : Airline dimension
- dim_airplane : Airplane dimension
- dim_airport : Airport dimension for origin and destination
- dim_time : Time dimension for departure and arrival
- fact_flight : Fact table for flight

Here is the code:

```
DROP DATABASE IF EXISTS airports_dw;
CREATE DATABASE airports_dw;
USE airports_dw;
CREATE TABLE dim_airline (
    AIRLINE_ID INT,
    AIRLINE_NAME VARCHAR(255),
    PRIMARY KEY (AIRLINE_ID)
);
CREATE TABLE dim_airplane (
    AIRPLANE_ID INT,
    AIRPLANE_TYPE VARCHAR(255),
    PRIMARY KEY (AIRPLANE_ID)
);
CREATE TABLE dim_airport(
    AIRPORT_ID INT,
    AIRPORT_NAME VARCHAR(255),
    CITY VARCHAR(255),
    COUNTRY VARCHAR(255),
    PRIMARY KEY (AIRPORT_ID)
);
CREATE TABLE dim_time(
    TIME_ID DATETIME,
```

```
YEAR_ID INT,
    MONTH ID INT,
    MONTH_NAME VARCHAR(255),
    DAY_ID INT,
    PRIMARY KEY (TIME ID)
);
CREATE TABLE fact flight(
    FLIGHT_ID INT,
    PASSENGERS_NUMBER INT,
    RECEIVE_TOTAL DOUBLE,
    AIRLINE_ID INT,
    AIRPLANE_ID INT,
    ORIGIN_AIRPORT_ID INT,
    DESTINATION_AIRPORT_ID INT,
    DEPARTURE_TIME_ID DATETIME,
    ARRIVAL_TIME_ID 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_AIRPORT_ID) REFERENCES dim_airport (AIRPORT_ID),
    FOREIGN KEY (DESTINATION_AIRPORT_ID) REFERENCES dim_airport
(AIRPORT_ID),
    FOREIGN KEY (DEPARTURE_TIME_ID) REFERENCES dim_time (TIME_ID),
    FOREIGN KEY (ARRIVAL_TIME_ID) REFERENCES dim_time (TIME_ID)
);
```

Then to create the airports data warehouse we execute the following command: source airports dw.sql

II - Transformations developed in PDI

Airline dimension

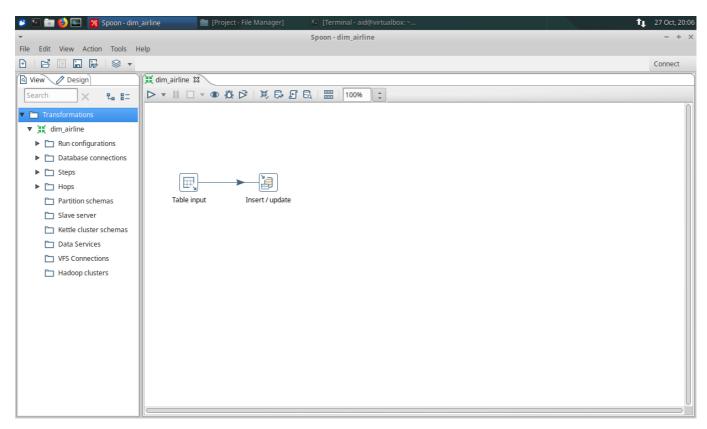


Figure 1 - dim_airline entire transformation

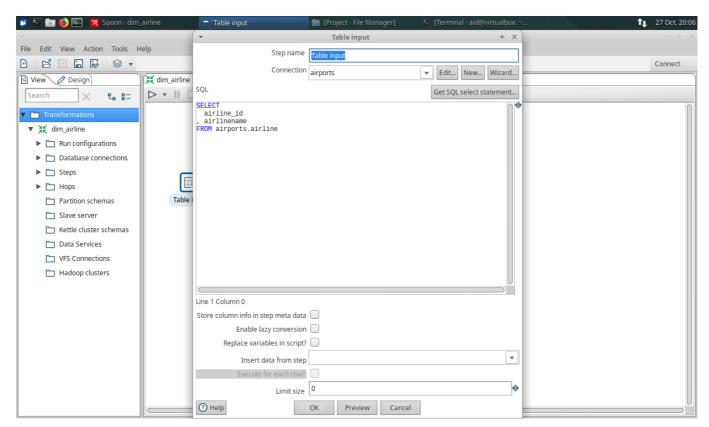


Figure 2 - dim_airline table input window

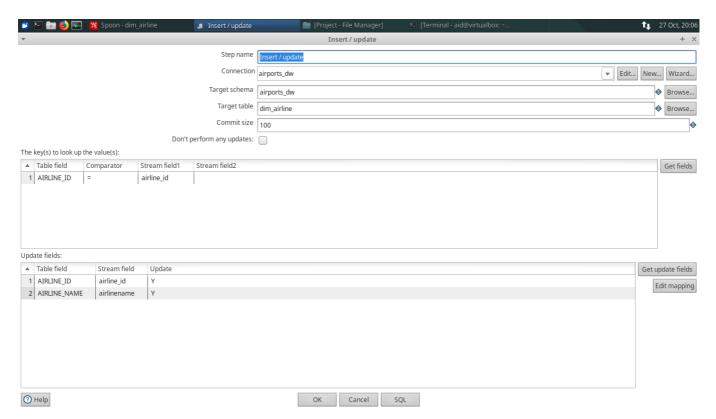


Figure 3 - dim_airline insert/update window

Airplane dimension

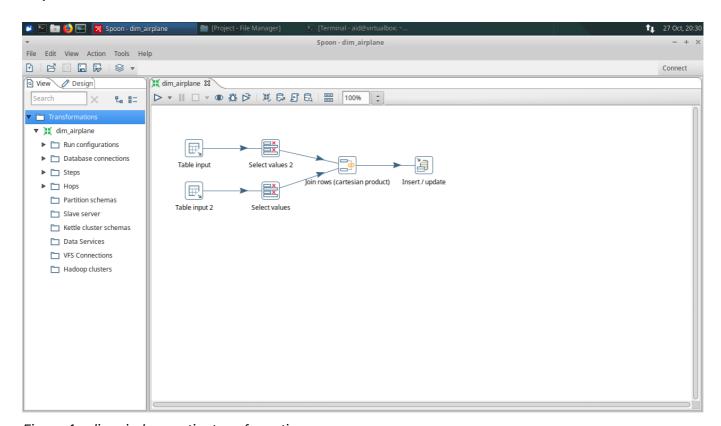


Figure 4 - dim_airplane entire transformation

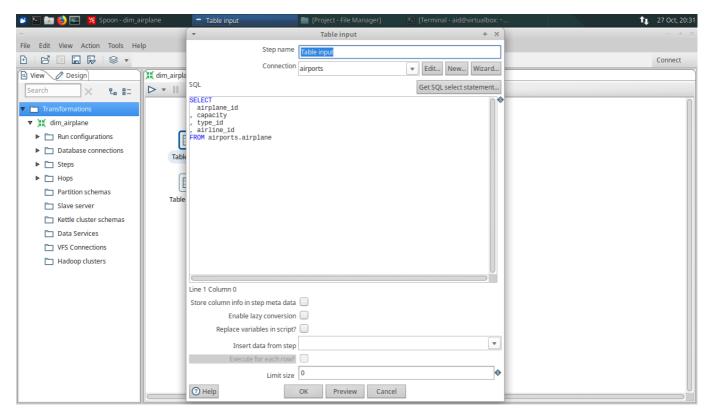


Figure 5 - dim_airplane table input window

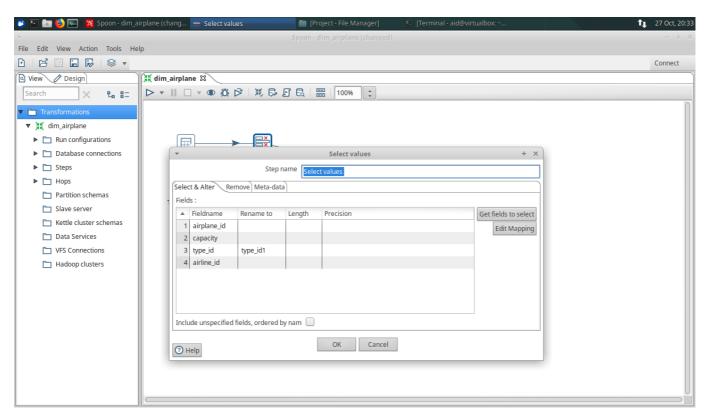


Figure 6 - dim_airplane select values window

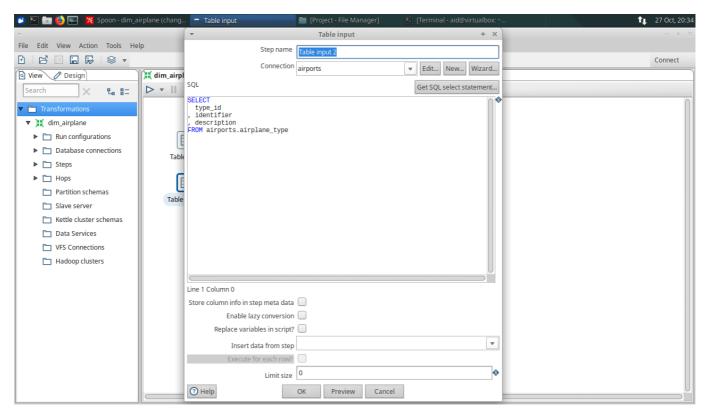


Figure 7 - dim_airplane table input 2 window

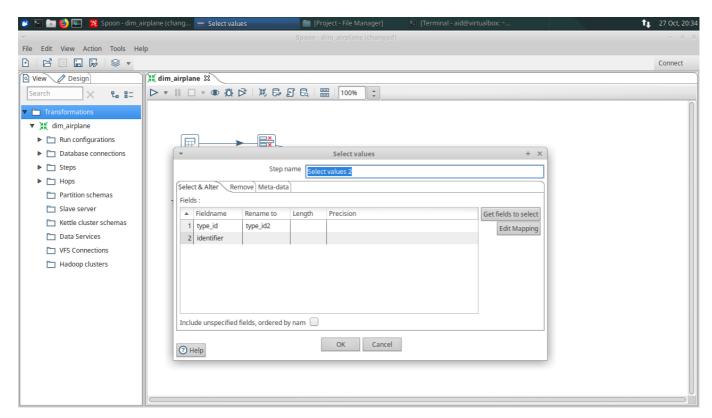


Figure 8 - dim_airplane select values 2 window

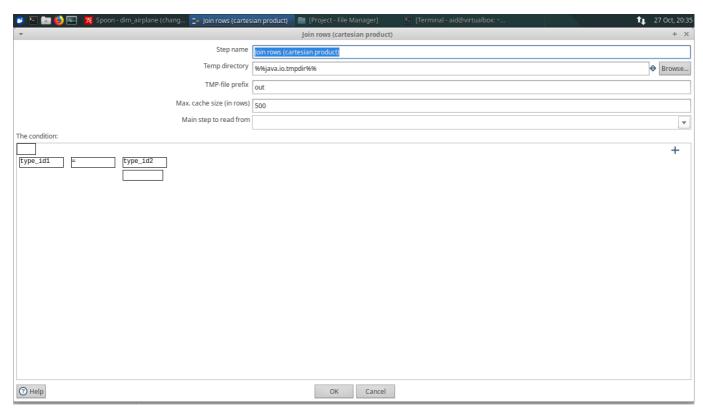


Figure 9 - dim_airplane join rows window

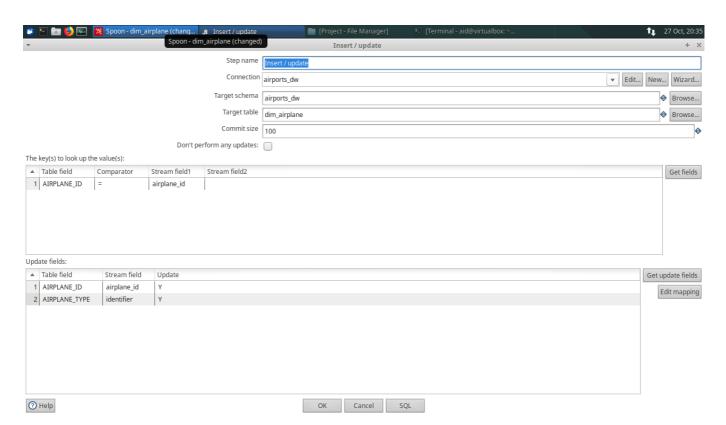


Figure 10 - dim_airplane insert/update window

Airport dimension

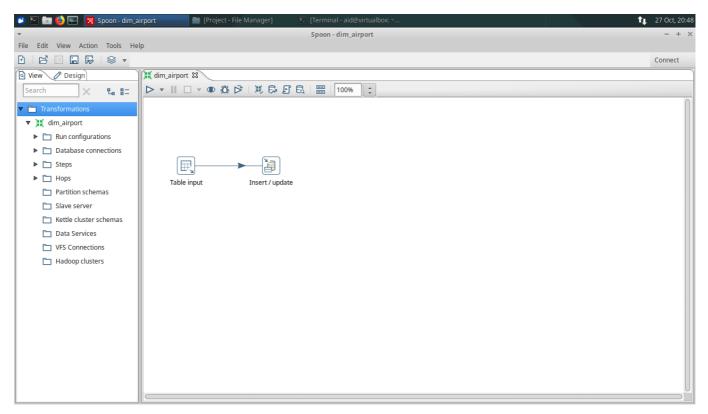


Figure 11 - dim_airport entire transformation

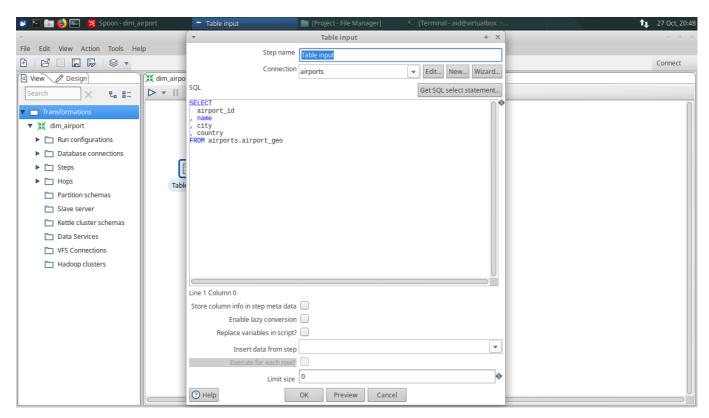


Figure 12 - dim_airport input table window

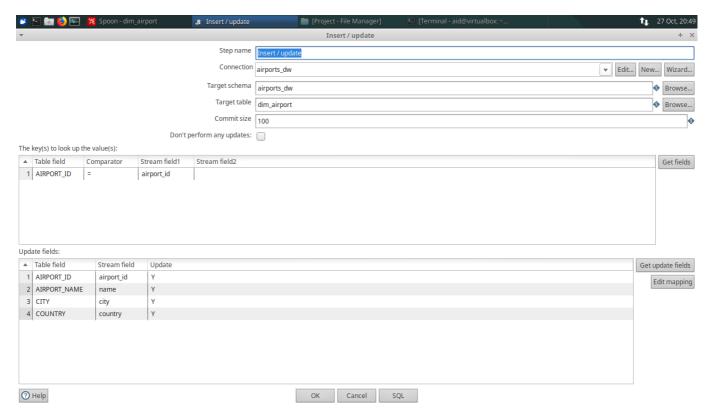


Figure 13 - dim_airport insert/update window

Time dimension

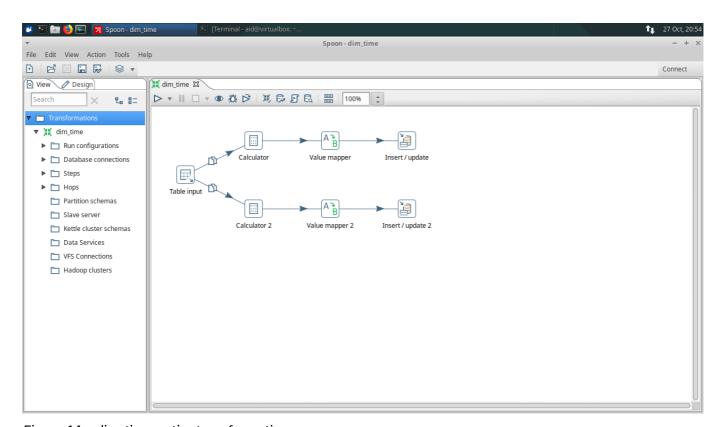


Figure 14 - dim_time entire transformation

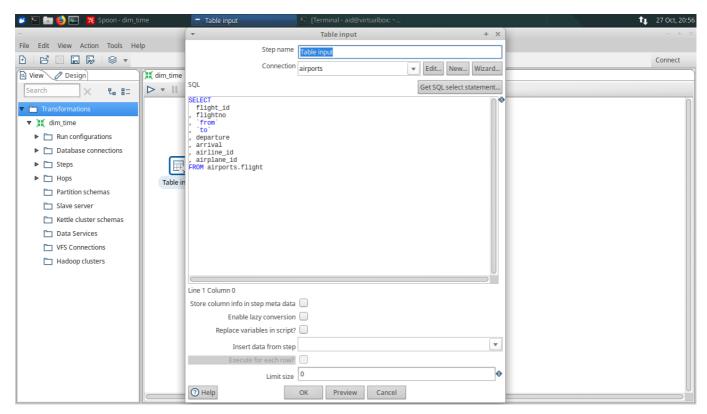


Figure 15 - dim_time table input window

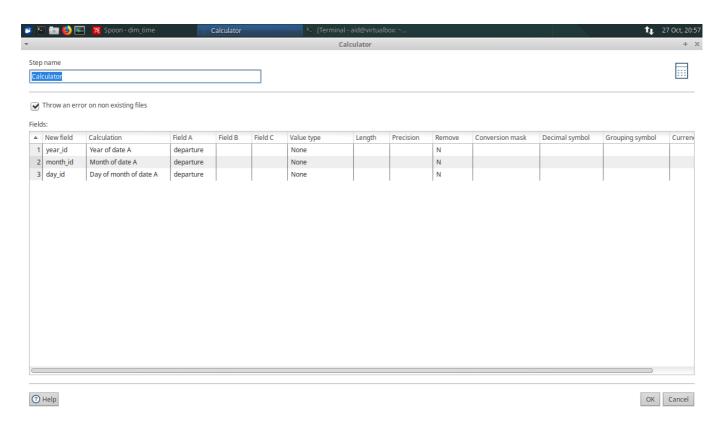


Figure 16 - dim_time calculator window

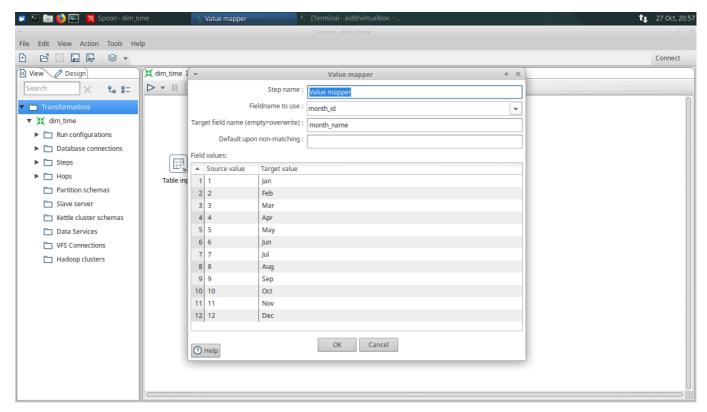


Figure 17 - dim_time value mapper window

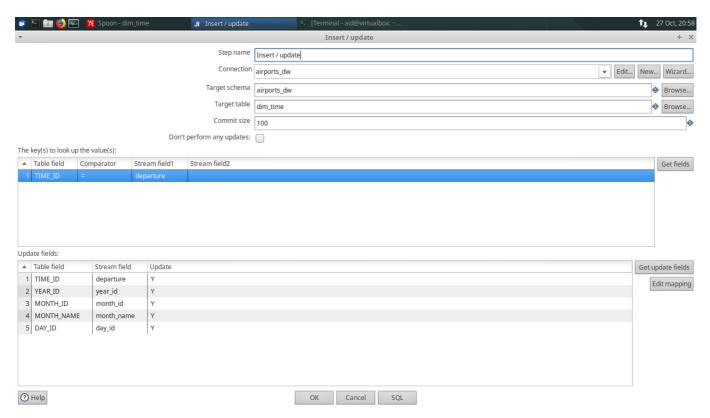


Figure 18 - dim_time insert/update window (departure time)

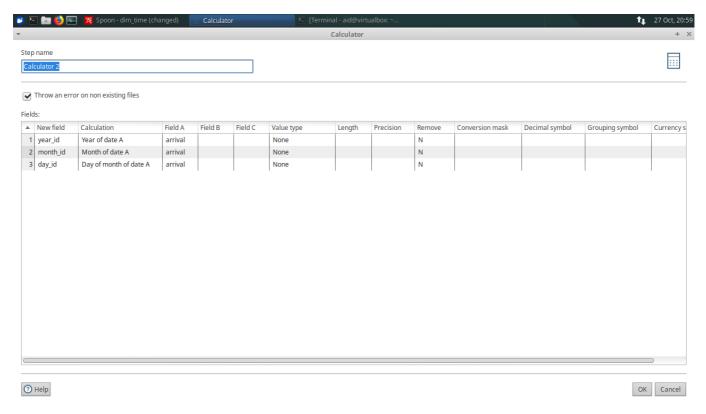


Figure 19 - dim_time calculator 2 window

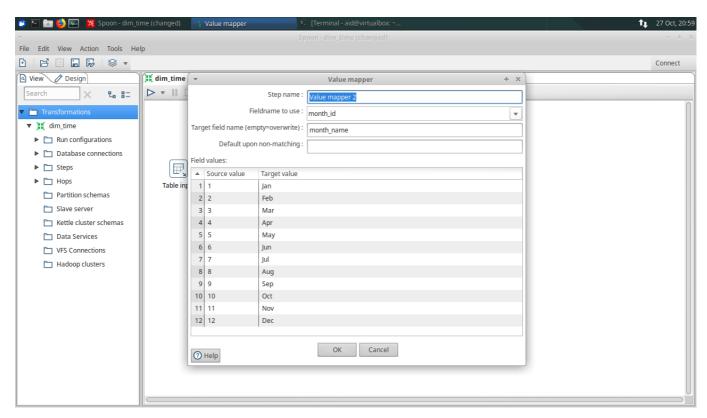


Figure 20 - dim_time value mapper 2 window

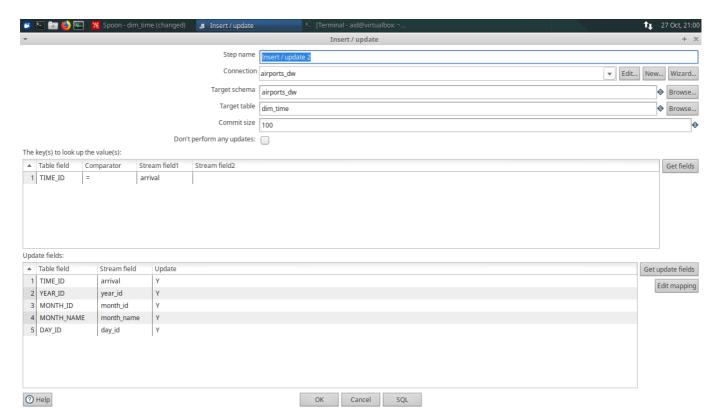


Figure 21 - dim_time insert/update 2 window (arrival time)

Flight fact

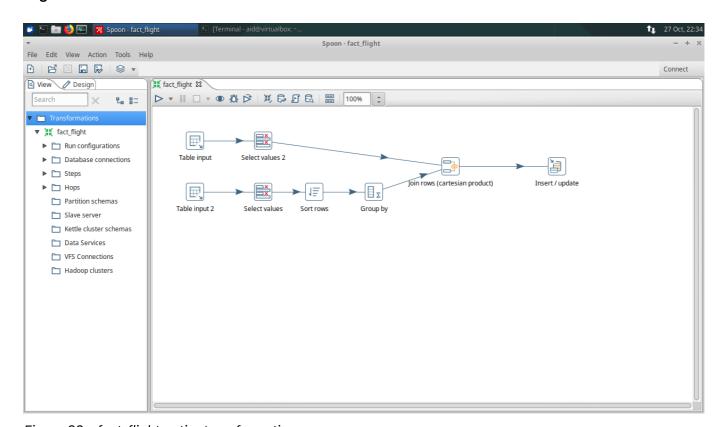


Figure 22 - fact_flight entire transformation

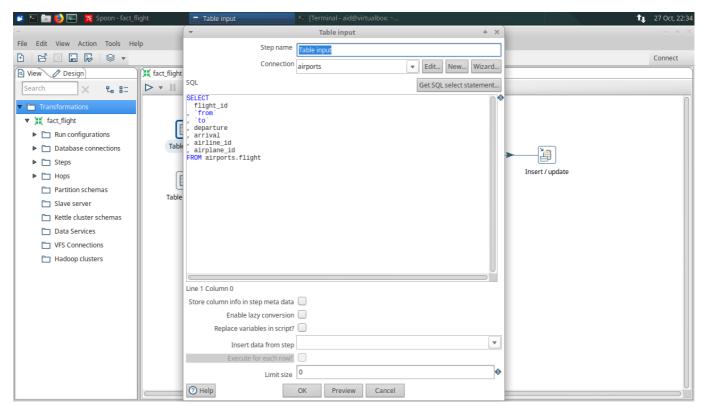


Figure 23 - fact_flight table input window

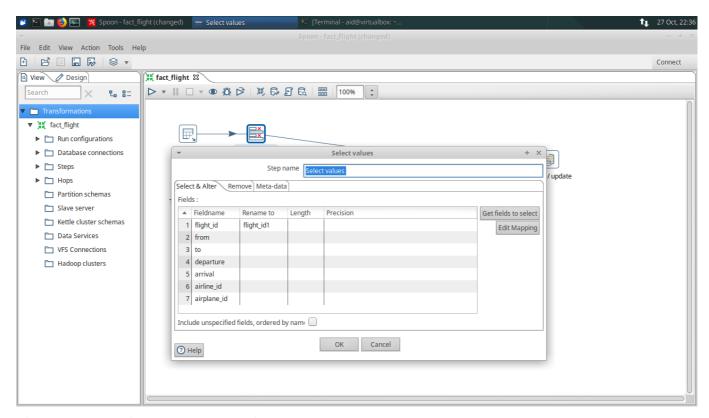


Figure 24 - fact_flight select values window

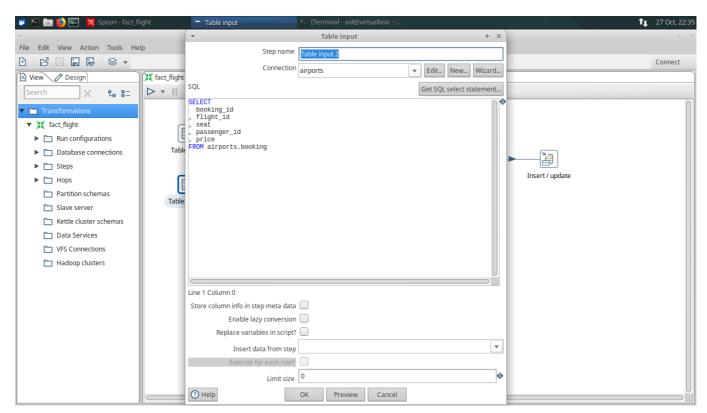


Figure 25 - fact_flight table input 2 window

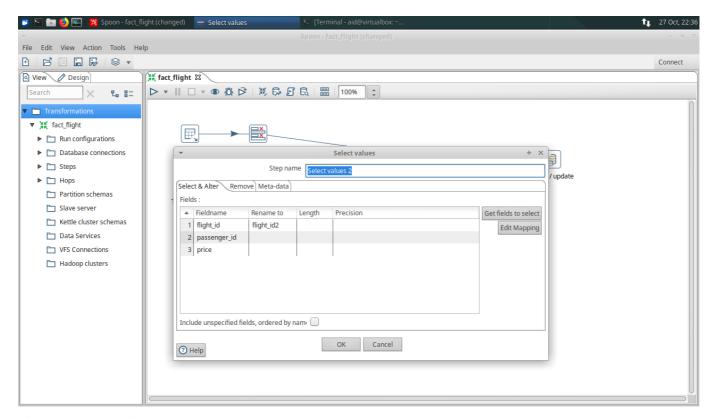


Figure 26 - fact_flight select values 2 window

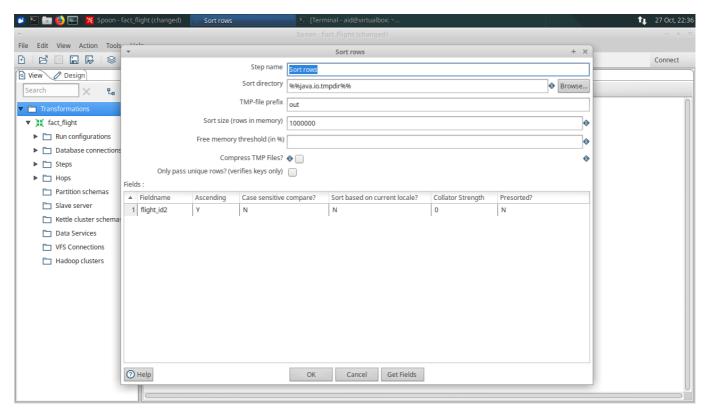


Figure 27 - fact_flight sort rows window

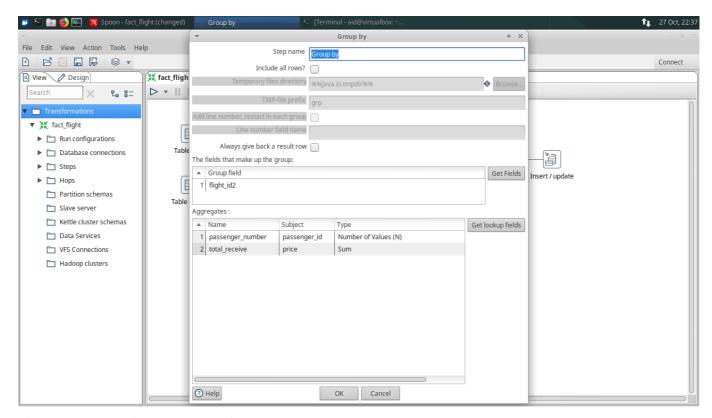


Figure 28 - fact_flight group by window (number of passengers and revenue)

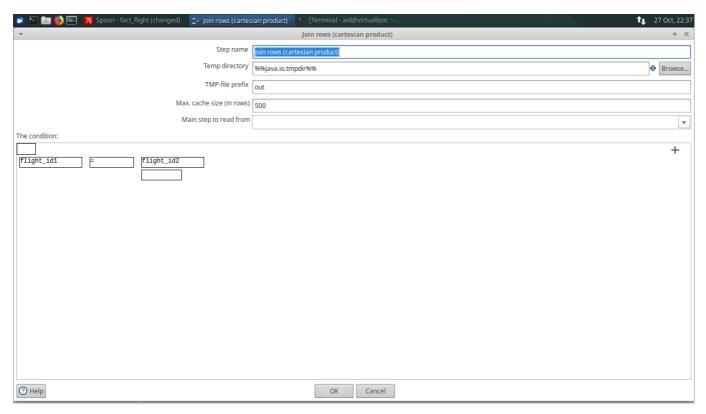


Figure 29 - fact_flight join rows window

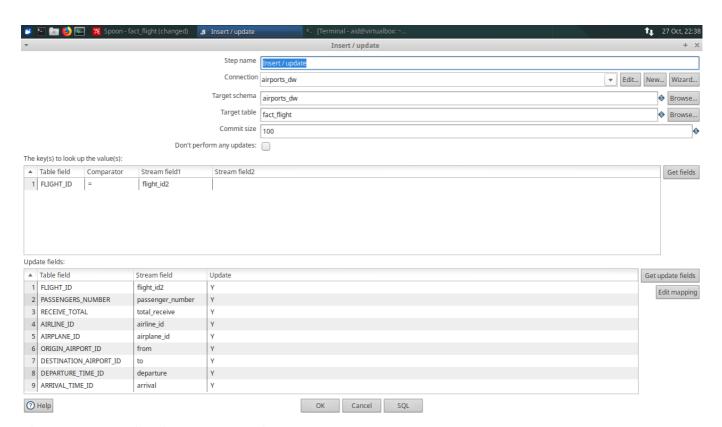


Figure 30 - fact_flight insert/update window

III - XML Code for the 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"</pre>
foreignKey="AIRLINE ID" highCardinality="false" name="Airline">
      <Hierarchy name="Airline Hierarchy" visible="true" hasAll="true"</pre>
allMemberName="All Arlines" primaryKey="AIRLINE_ID">
        <Table name="dim airline">
        </Table>
        <Level name="Name" visible="true" column="AIRLINE_NAME"</pre>
type="String" uniqueMembers="false" levelType="Regular"
hideMemberIf="Never">
        </Level>
      </Hierarchy>
    </Dimension>
    <Dimension type="StandardDimension" visible="true"</pre>
foreignKey="DESTINATION_AIRPORT_ID" highCardinality="false"
name="Airport">
      <Hierarchy name="Airport Hierarchy" visible="true" hasAll="true"</pre>
allMemberName="All Airports" primaryKey="AIRPORT_ID">
        <Table name="dim airport">
        </Table>
        <Level name="Country" visible="true" column="COUNTRY"</pre>
type="String" uniqueMembers="false" levelType="Regular"
hideMemberIf="Never">
        </Level>
        <Level name="City" visible="true" column="CITY" type="String"</pre>
uniqueMembers="false" levelType="Regular" hideMemberIf="Never">
        </Level>
    <Level name="Name" visible="true" column="AIRPORT_NAME" type="String"</pre>
uniqueMembers="false" levelType="Regular" hideMemberIf="Never">
        </Level>
      </Hierarchy>
    </Dimension>
    <Dimension type="TimeDimension" visible="true"</pre>
foreignKey="DEPARTURE_TIME_ID" highCardinality="false" name="Time">
      <Hierarchy name="Time Hierarchy" visible="true" hasAll="true"</pre>
allMemberName="All Years" primaryKey="TIME_ID">
        <Table name="dim_time">
        </Table>
        <Level name="Year" visible="true" column="YEAR_ID" type="Integer"</pre>
uniqueMembers="false" levelType="TimeYears" hideMemberIf="Never">
        </Level>
        <Level name="Month" visible="true" column="MONTH NAME"</pre>
ordinalColumn="MONTH_ID" type="String" uniqueMembers="false"
levelType="TimeMonths" hideMemberIf="Never">
        </Level>
        <Level name="Day" visible="true" column="DAY_ID" type="Integer"</pre>
uniqueMembers="false" levelType="TimeDays" hideMemberIf="Never">
        </Level>
      </Hierarchy>
    </Dimension>
    <Dimension type="StandardDimension" visible="true"</pre>
foreignKey="AIRPLANE_ID" name="Airplane">
      <Hierarchy name="Airplane Hierarchy" visible="true" hasAll="true"</pre>
allMemberName="All Airplanes" primaryKey="AIRPLANE_ID">
        <Table name="dim_airplane">
```