ANALYTICS FOR ADVENTUREWORKS

EAE Data Management 2020

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OVERVIEW

ADVENTUREWORKS CYCLES NEEDS **INSIGHTS** TO **IMPROVE** COMPANY’S OVERALL **BUSINESS PERFORMANCE**

SCOPE

ANALYTICS WILL FOCUS FIRST IN

SALES AND **PURCHASING**

TO DRIVE IMPROVEMENTS IN

KEY FINANCIAL PERFORMANCE INDICATORS

BUSINESS CHALLENGES / INSIGHTS

SEASONAL SALES

Create top 5 products sales ranking by seasons.

HOLIDAY SALES

Reseller sales vs direct consumer sales over specific holiday days.

PRODUCT PROFITABILITY

Create top 5 products profit ranking, quarter by quarter

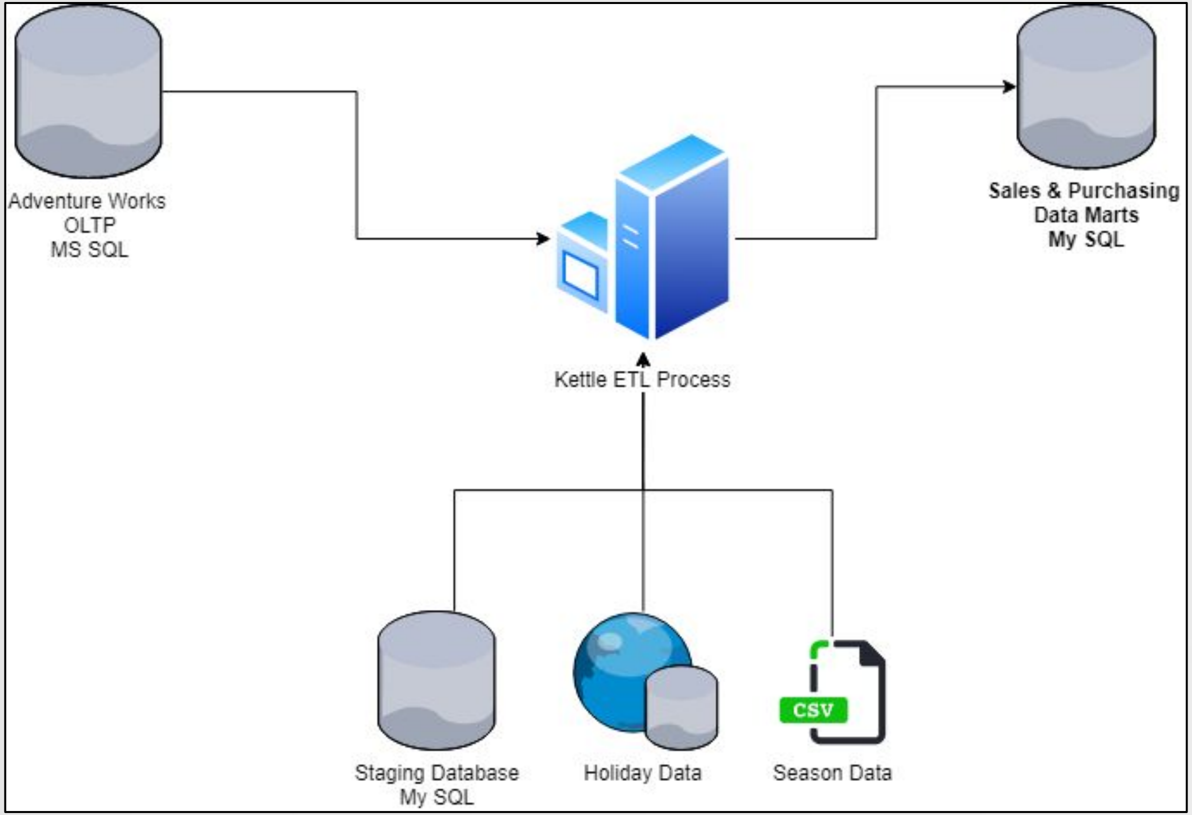
REJECTED ITEMS

Create a top 5 Vendor ranking of rejected items on purchase orders.

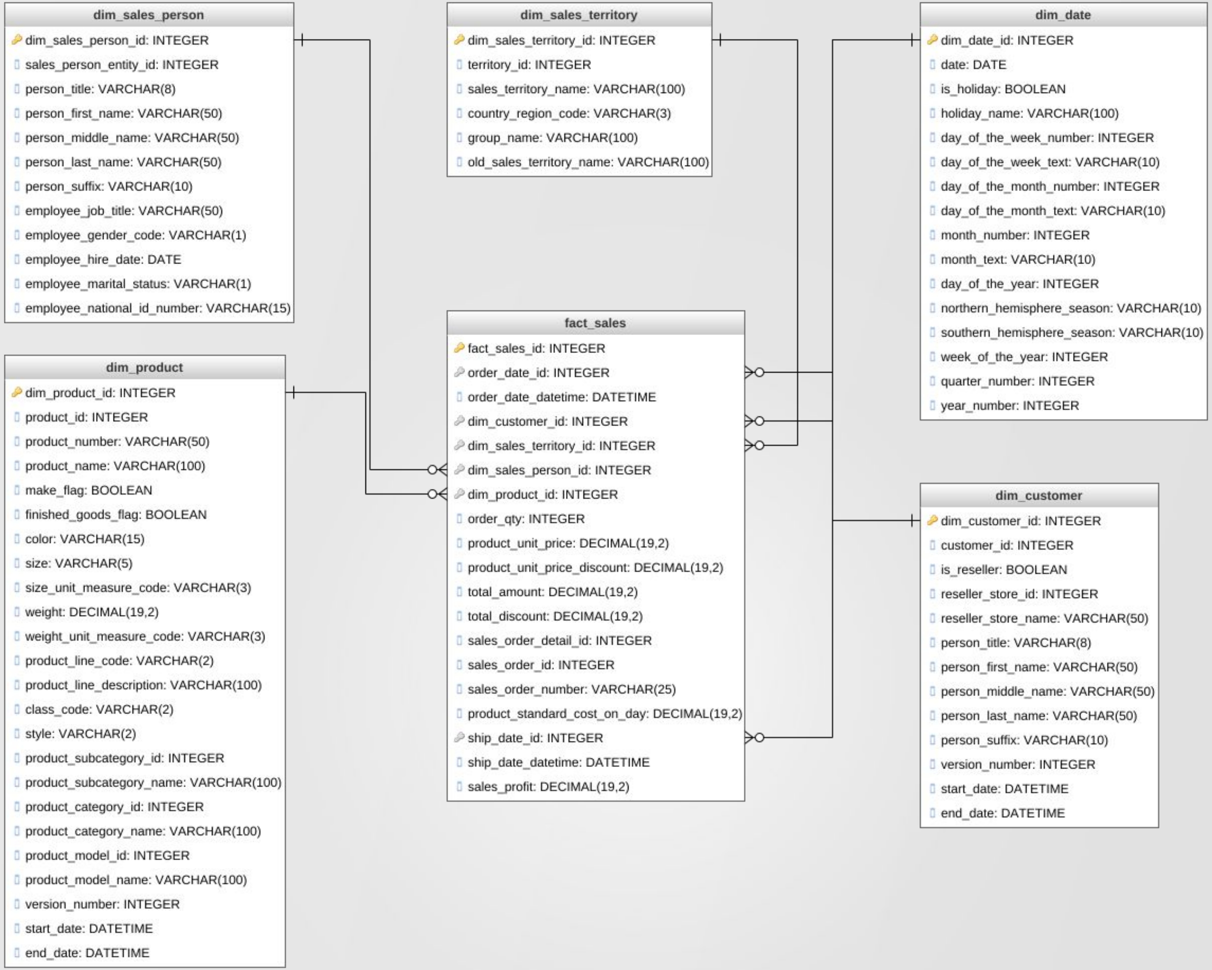
PURCHASED VS SOLD

Sold items vs purchased items, for each product category

ARCHITECTURE



SALES DATA MART



dim_sales_person

- dim_sales_person_id: INTEGER
- sales_person_entity_id: INTEGER
- person_title: VARCHAR(8)
- person_first_name: VARCHAR(50)
- person_middle_name: VARCHAR(50)
- person_last_name: VARCHAR(50)
- person_suffix: VARCHAR(10)
- employee_job_title: VARCHAR(50)
- employee_gender_code: VARCHAR(1)
- employee_hire_date: DATE
- employee_marital_status: VARCHAR(1)
- employee_national_id_number: VARCHAR(15)

dim_product

- dim_product_id: INTEGER
- product_id: INTEGER
- product_number: VARCHAR(50)
- product_name: VARCHAR(100)
- make_flag: BOOLEAN
- finished_goods_flag: BOOLEAN
- color: VARCHAR(15)
- size: VARCHAR(5)
- size_unit_measure_code: VARCHAR(3)
- weight: DECIMAL(19,2)
- weight_unit_measure_code: VARCHAR(3)
- product_line_code: VARCHAR(2)
- product_line_description: VARCHAR(100)
- class_code: VARCHAR(2)
- style: VARCHAR(2)
- product_subcategory_id: INTEGER
- product_subcategory_name: VARCHAR(100)
- product_category_id: INTEGER
- product_category_name: VARCHAR(100)
- product_model_id: INTEGER
- product_model_name: VARCHAR(100)
- version_number: INTEGER
- start_date: DATETIME
- end_date: DATETIME

dim_sales_territory

- dim_sales_territory_id: INTEGER
- territory_id: INTEGER
- sales_territory_name: VARCHAR(100)
- country_region_code: VARCHAR(3)
- group_name: VARCHAR(100)
- old_sales_territory_name: VARCHAR(100)

fact_sales

- fact_sales_id: INTEGER
- order_date_id: INTEGER
- order_date_datetime: DATETIME
- dim_customer_id: INTEGER
- dim_sales_territory_id: INTEGER
- dim_sales_person_id: INTEGER
- dim_product_id: INTEGER
- order_qty: INTEGER
- product_unit_price: DECIMAL(19,2)
- product_unit_price_discount: DECIMAL(19,2)
- total_amount: DECIMAL(19,2)
- total_discount: DECIMAL(19,2)
- sales_order_detail_id: INTEGER
- sales_order_id: INTEGER
- sales_order_number: VARCHAR(25)
- product_standard_cost_on_day: DECIMAL(19,2)
- ship_date_id: INTEGER
- ship_date_datetime: DATETIME
- sales_profit: DECIMAL(19,2)

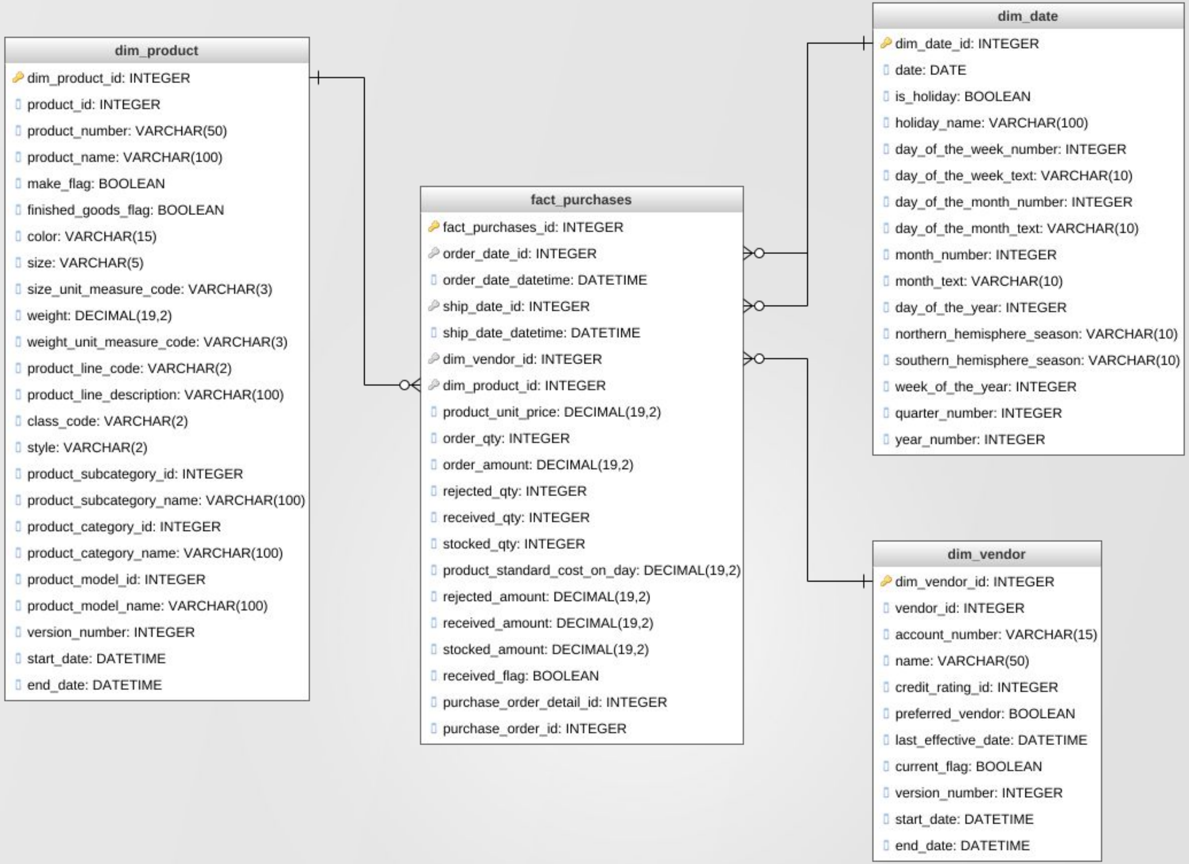
dim_date

- dim_date_id: INTEGER
- date: DATE
- is_holiday: BOOLEAN
- holiday_name: VARCHAR(100)
- day_of_the_week_number: INTEGER
- day_of_the_week_text: VARCHAR(10)
- day_of_the_month_number: INTEGER
- day_of_the_month_text: VARCHAR(10)
- month_number: INTEGER
- month_text: VARCHAR(10)
- day_of_the_year: INTEGER
- northern_hemisphere_season: VARCHAR(10)
- southern_hemisphere_season: VARCHAR(10)
- week_of_the_year: INTEGER
- quarter_number: INTEGER
- year_number: INTEGER

dim_customer

- dim_customer_id: INTEGER
- customer_id: INTEGER
- is_reseller: BOOLEAN
- reseller_store_id: INTEGER
- reseller_store_name: VARCHAR(50)
- person_title: VARCHAR(8)
- person_first_name: VARCHAR(50)
- person_middle_name: VARCHAR(50)
- person_last_name: VARCHAR(50)
- person_suffix: VARCHAR(10)
- version_number: INTEGER
- start_date: DATETIME
- end_date: DATETIME

PURCHASING DATA MART



dim_product

- dim_product_id: INTEGER
- product_id: INTEGER
- product_number: VARCHAR(50)
- product_name: VARCHAR(100)
- make_flag: BOOLEAN
- finished_goods_flag: BOOLEAN
- color: VARCHAR(15)
- size: VARCHAR(5)
- size_unit_measure_code: VARCHAR(3)
- weight: DECIMAL(19,2)
- weight_unit_measure_code: VARCHAR(3)
- product_line_code: VARCHAR(2)
- product_line_description: VARCHAR(100)
- class_code: VARCHAR(2)
- style: VARCHAR(2)
- product_subcategory_id: INTEGER
- product_subcategory_name: VARCHAR(100)
- product_category_id: INTEGER
- product_category_name: VARCHAR(100)
- product_model_id: INTEGER
- product_model_name: VARCHAR(100)
- version_number: INTEGER
- start_date: DATETIME
- end_date: DATETIME

fact_purchases

- fact_purchases_id: INTEGER
- order_date_id: INTEGER
- order_date_datetime: DATETIME
- ship_date_id: INTEGER
- ship_date_datetime: DATETIME
- dim_vendor_id: INTEGER
- dim_product_id: INTEGER
- product_unit_price: DECIMAL(19,2)
- order_qty: INTEGER
- order_amount: DECIMAL(19,2)
- rejected_qty: INTEGER
- received_qty: INTEGER
- stocked_qty: INTEGER
- product_standard_cost_on_day: DECIMAL(19,2)
- rejected_amount: DECIMAL(19,2)
- received_amount: DECIMAL(19,2)
- stocked_amount: DECIMAL(19,2)
- received_flag: BOOLEAN
- purchase_order_detail_id: INTEGER
- purchase_order_id: INTEGER

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- date: DATE
- is_holiday: BOOLEAN
- holiday_name: VARCHAR(100)
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- day_of_the_month_number: INTEGER
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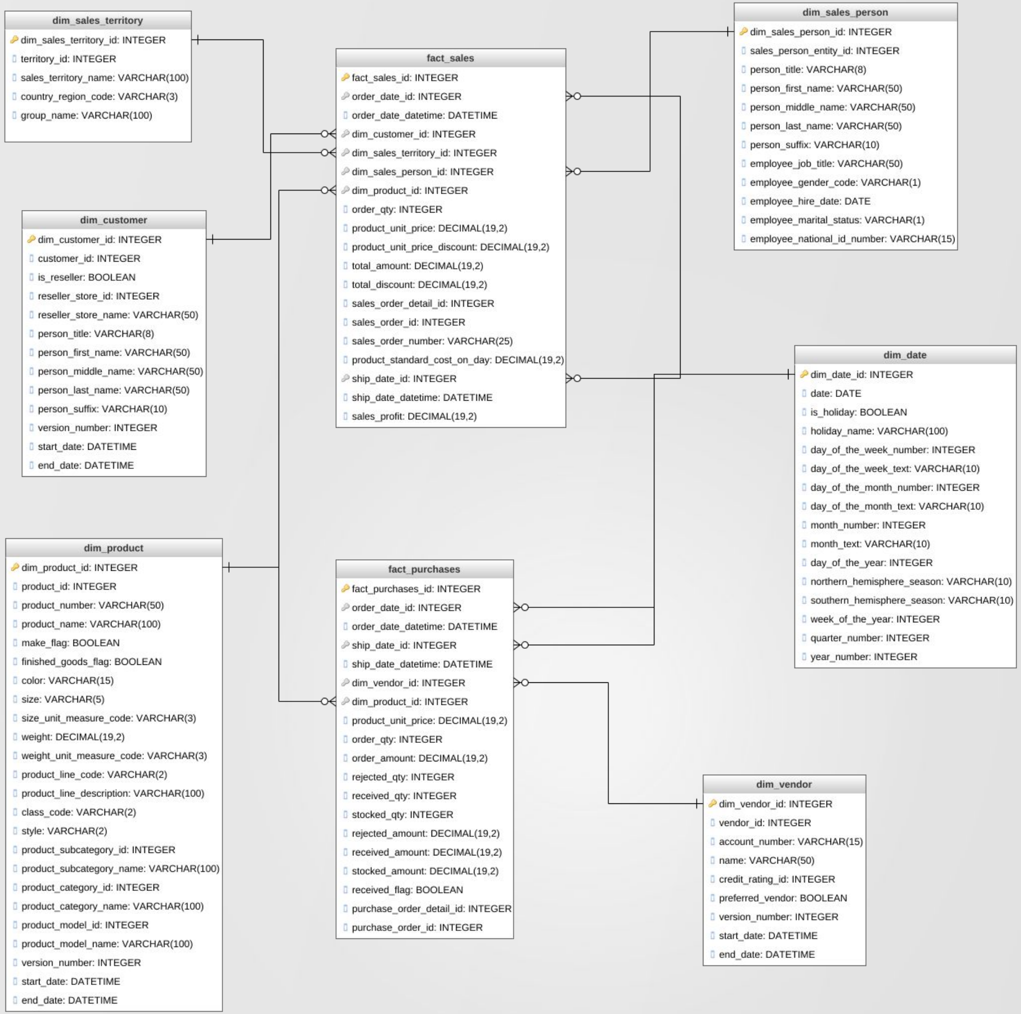
- northern_hemisphere_season: VARCHAR(10)
- southern_hemisphere_season: VARCHAR(10)
- week_of_the_year: INTEGER
- quarter_number: INTEGER
- year_number: INTEGER

dim_vendor

- dim_vendor_id: INTEGER
- vendor_id: INTEGER
- account_number: VARCHAR(15)
- name: VARCHAR(50)
- credit_rating_id: INTEGER
- preferred_vendor: BOOLEAN
- last_effective_date: DATETIME
- current_flag: BOOLEAN
- version_number: INTEGER
- start_date: DATETIME
- end_date: DATETIME

ANALYTICAL MODEL



dim_sales_territory
- dim_sales_territory_id: INTEGER
- territory_id: INTEGER
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- country_region_code: VARCHAR(3)
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- dim_product_id: INTEGER
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- product_unit_price_discount: DECIMAL(19,2)
- total_amount: DECIMAL(19,2)
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- stocked_qty: INTEGER
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- purchase_order_id: INTEGER

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- person_middle_name: VARCHAR(50)
- person_last_name: VARCHAR(50)
- person_suffix: VARCHAR(10)
- employee_job_title: VARCHAR(50)
- employee_gender_code: VARCHAR(1)
- employee_hire_date: DATE
- employee_marital_status: VARCHAR(1)
- employee_national_id_number: VARCHAR(15)

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- date: DATE
- is_holiday: BOOLEAN
- holiday_name: VARCHAR(100)
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- day_of_the_week_text: VARCHAR(10)
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- day_of_the_year: INTEGER
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- quarter_number: INTEGER
- year_number: INTEGER

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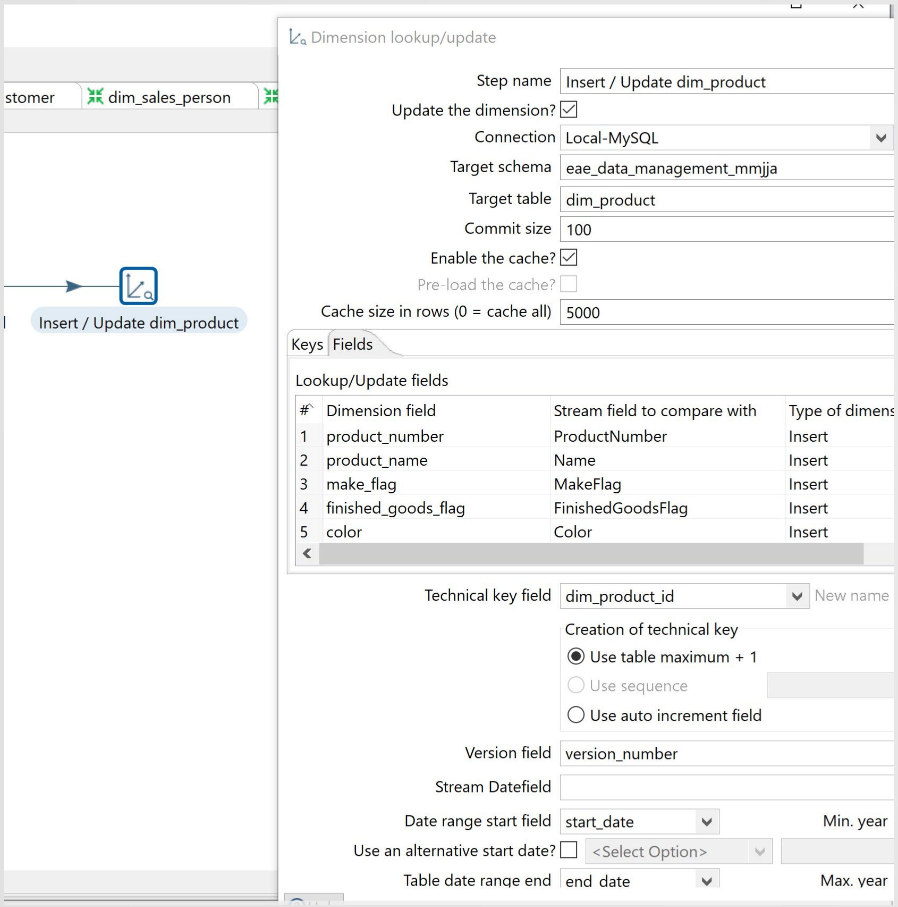
- dim_vendor_id: INTEGER
- vendor_id: INTEGER
- account_number: VARCHAR(15)
- name: VARCHAR(50)
- credit_rating_id: INTEGER
- preferred_vendor: BOOLEAN
- version_number: INTEGER
- start_date: DATETIME
- end_date: DATETIME

PRODUCT DIMENSION HIGHLIGHTS

Column Name	Key?	Description	Source
dim_product_id	Yes	Surrogate key	Generated in the mySql DB using the add sequence feature in Kettle
product_id	No	ID for products Primary key of transactional DB	Extracted from AdventureWorks2019 table Production.Product column ProductID
product_number	No	Product number	Extracted from AdventureWorks2019 table Production.Product column ProductNumber
start_date	No	Start effective date for the product version	Calculated in Kettle, based on ADventureworks2019 changes
end_date	No	End effective date for the product version	Calculated in Kettle, based on ADventureworks2019 changes
version_number	No	Version number representing the sequence where a product has changed in history, after the dimension first load	Calculated in Kettle, based on ADventureworks2019 changes

PRODUCT TRANSFORMATION HIGHLIGHTS



Dimension lookup/update

Step name: Insert / Update dim_product

Update the dimension? ☑

Connection: Local-MySQL

Target schema: eae_data_management_mmjja

Target table: dim_product

Commit size: 100

Enable the cache? ☑

Pre-load the cache? □

Cache size in rows (0 = cache all): 5000

Keys | Fields

Lookup/Update fields

#	Dimension field	Stream field to compare with	Type of dimens
1	product_number	ProductNumber	Insert
2	product_name	Name	Insert
3	make_flag	MakeFlag	Insert
4	finished_goods_flag	FinishedGoodsFlag	Insert
5	color	Color	Insert

Technical key field: dim_product_id New name

Creation of technical key

● Use table maximum + 1

○ Use sequence

○ Use auto increment field

Version field: version_number

Stream Datefield:

Date range start field: start_date Min. year

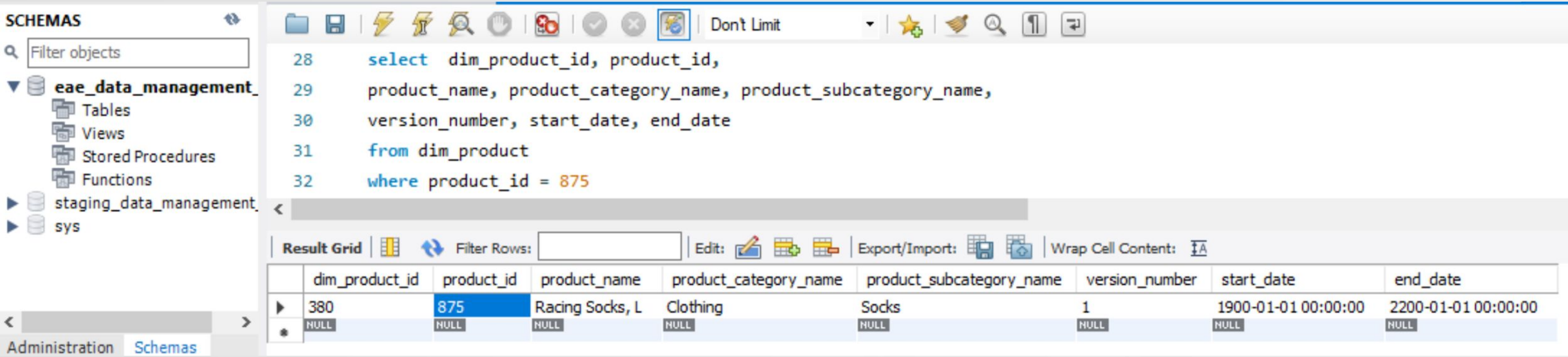
Use an alternative start date? □ <Select Option>

Table date range end: end_date Max. year

SDC TYPE #2

Using Dimension lookup/update component

PRODUCT TRANSFORMATION HIGHLIGHTS

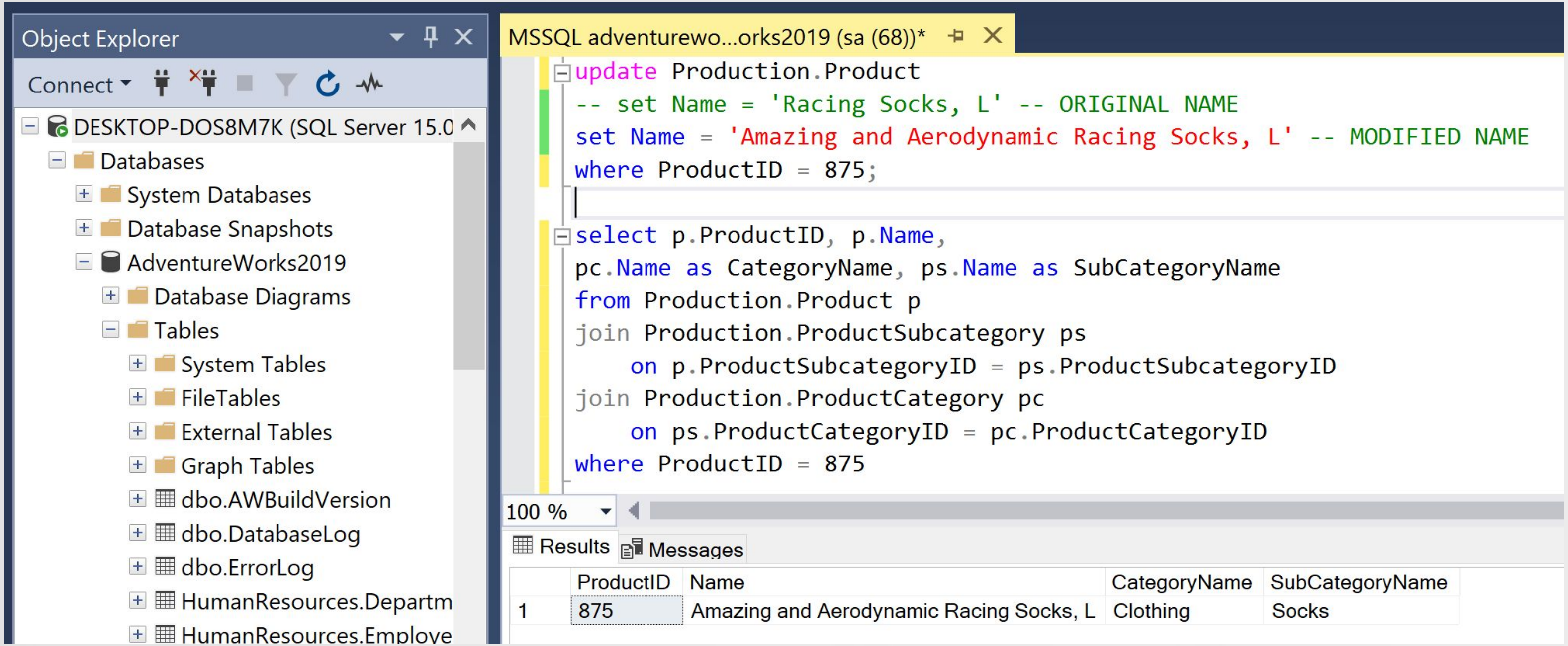


```sql
select  dim_product_id, product_id,
product_name, product_category_name, product_subcategory_name,
version_number, start_date, end_date
from dim_product
where product_id = 875
```

dim_product_id	product_id	product_name	product_category_name	product_subcategory_name	version_number	start_date	end_date
380	875	Racing Socks, L	Clothing	Socks	1	1900-01-01 00:00:00	2200-01-01 00:00:00
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

INITIAL STATE OF PRODUCT

PRODUCT TRANSFORMATION HIGHLIGHTS

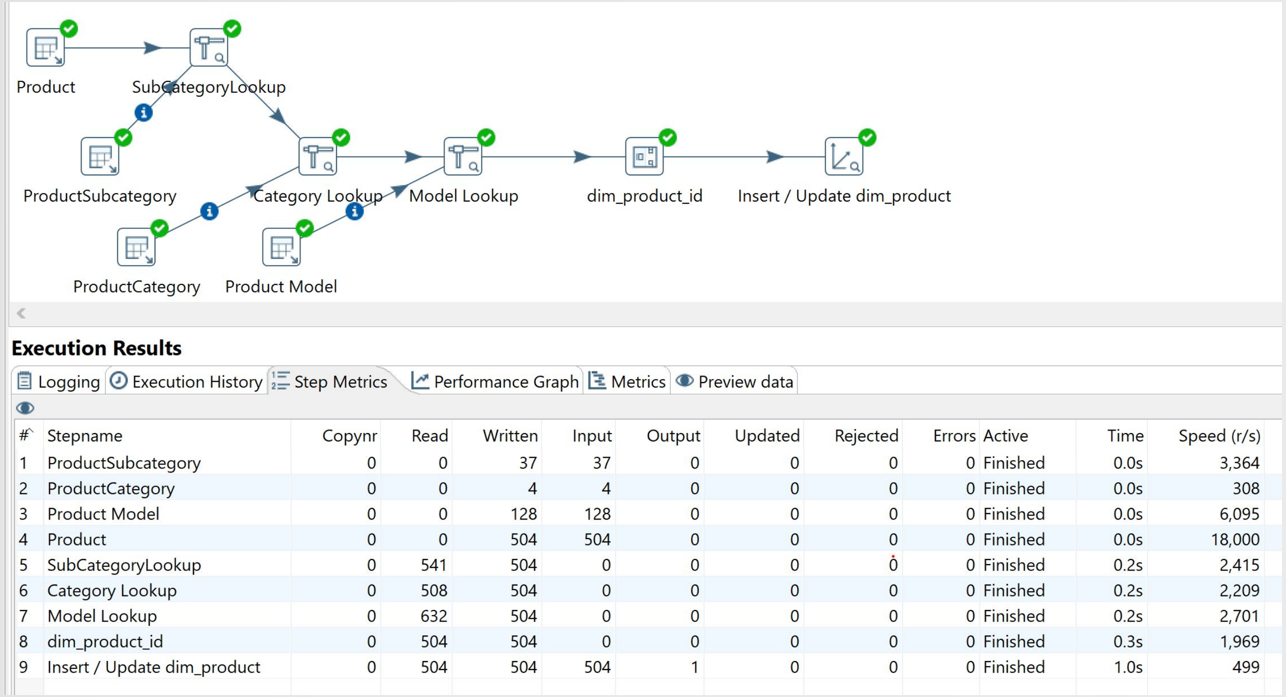


```sql
update Production.Product
-- set Name = 'Racing Socks, L' -- ORIGINAL NAME
set Name = 'Amazing and Aerodynamic Racing Socks, L' -- MODIFIED NAME
where ProductID = 875;

select p.ProductID, p.Name,
pc.Name as CategoryName, ps.Name as SubCategoryName
from Production.Product p
join Production.ProductSubcategory ps
    on p.ProductSubcategoryID = ps.ProductSubcategoryID
join Production.ProductCategory pc
    on ps.ProductCategoryID = pc.ProductCategoryID
where ProductID = 875
```

	ProductID	Name	CategoryName	SubCategoryName
1	875	Amazing and Aerodynamic Racing Socks, L	Clothing	Socks

NAME CHANGED AT TRANSACTIONAL DATABASE

PRODUCT TRANSFORMATION HIGHLIGHTS

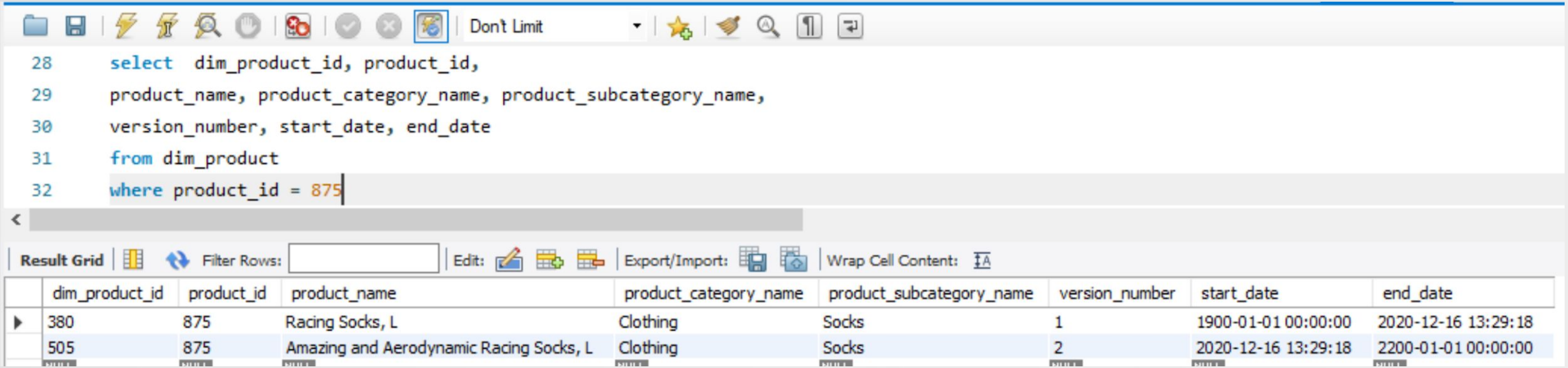


Execution Results

#	Stepname	Copynr	Read	Written	Input	Output	Updated	Rejected	Errors	Active	Time	Speed (r/s)
1	ProductSubcategory	0	0	37	37	0	0	0	0	Finished	0.0s	3,364
2	ProductCategory	0	0	4	4	0	0	0	0	Finished	0.0s	308
3	Product Model	0	0	128	128	0	0	0	0	Finished	0.0s	6,095
4	Product	0	0	504	504	0	0	0	0	Finished	0.0s	18,000
5	SubCategoryLookup	0	541	504	0	0	0	0	0	Finished	0.2s	2,415
6	Category Lookup	0	508	504	0	0	0	0	0	Finished	0.2s	2,209
7	Model Lookup	0	632	504	0	0	0	0	0	Finished	0.2s	2,701
8	dim_product_id	0	504	504	0	0	0	0	0	Finished	0.3s	1,969
9	Insert / Update dim_product	0	504	504	504	1	0	0	0	Finished	1.0s	499

1 OUTPUT, INSERT DETECTED

PRODUCT TRANSFORMATION HIGHLIGHTS



```
select  dim_product_id, product_id,
product_name, product_category_name, product_subcategory_name,
version_number, start_date, end_date
from dim_product
where product_id = 875
```

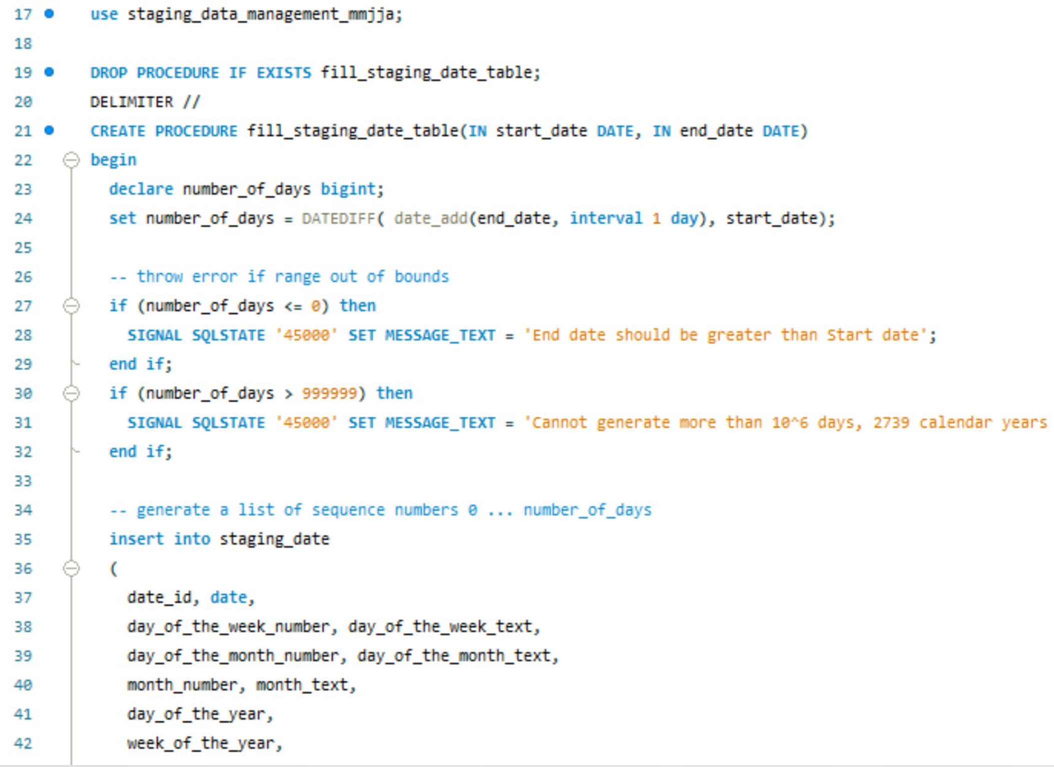
dim_product_id	product_id	product_name	product_category_name	product_subcategory_name	version_number	start_date	end_date
380	875	Racing Socks, L	Clothing	Socks	1	1900-01-01 00:00:00	2020-12-16 13:29:18
505	875	Amazing and Aerodynamic Racing Socks, L	Clothing	Socks	2	2020-12-16 13:29:18	2200-01-01 00:00:00

PRODUCT SECOND VERSION

DATE DIMENSION HIGHLIGHTS

Column Name	Key?	Description	Source
dim_date_id	Yes	This is the surrogate key It is an integer with the following format: 20201214	Generated in a staging database, that lists days in a datarange **YEAR * 10,000 + MONTH * 100 + DAY**
is_holiday	No	Flag indicating if it is a holiday or not	Holiday data is exrtracted via an API from https://date.nager.at/api/v2/publicholidays/2020/es
holiday_name	No	National HOliday name for Spain	Holiday data is exrtracted via an API from https://date.nager.at/api/v2/publicholidays/2020/es
date	No	Represents the day of the row, in a date dabase field	Generated in a staging database, that lists days in a datarange
northern_hemisphere_season	No	Season text in english for the northern hemisphere text: (Winter, Autum, Summer, Fall)	Calculated from a csv source
southern_hemisphere_season	No	Season text in english for the southern hemisphere text: (Winter, Autum, Summer, Fall)	Calculated from a csv source

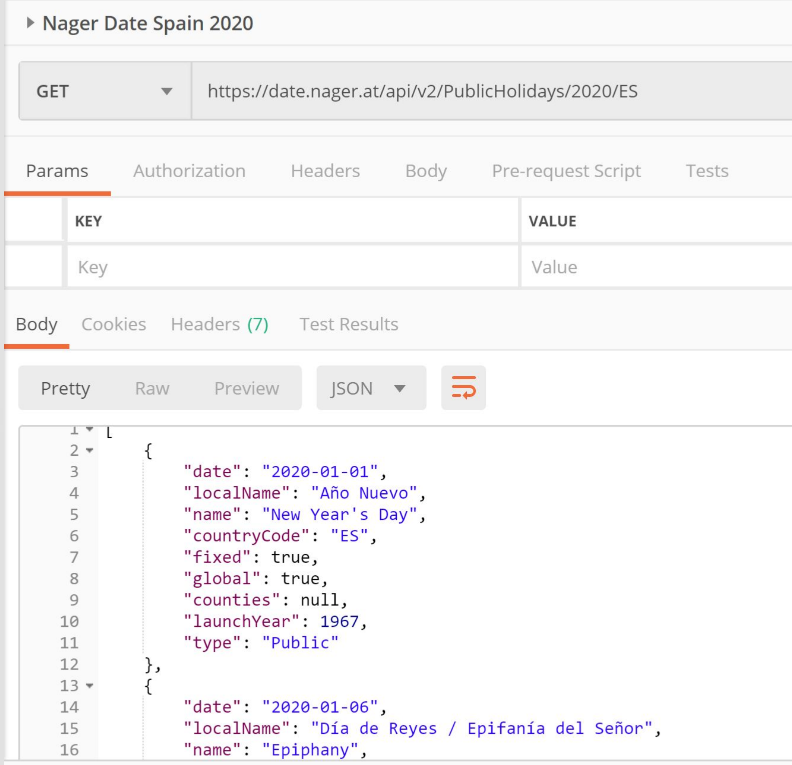
DATE TRANSFORMATION HIGHLIGHTS



```
use staging_data_management_mmjja;

DROP PROCEDURE IF EXISTS fill_staging_date_table;
DELIMITER //
CREATE PROCEDURE fill_staging_date_table(IN start_date DATE, IN end_date DATE)
begin
  declare number_of_days bigint;
  set number_of_days = DATEDIFF( date_add(end_date, interval 1 day), start_date);

  -- throw error if range out of bounds
  if (number_of_days <= 0) then
    SIGNAL SQLSTATE '45000' SET MESSAGE_TEXT = 'End date should be greater than Start date';
  end if;
  if (number_of_days > 999999) then
    SIGNAL SQLSTATE '45000' SET MESSAGE_TEXT = 'Cannot generate more than 10^6 days, 2739 calendar years
  end if;

  -- generate a list of sequence numbers 0 ... number_of_days
  insert into staging_date
  (
    date_id, date,
    day_of_the_week_number, day_of_the_week_text,
    day_of_the_month_number, day_of_the_month_text,
    month_number, month_text,
    day_of_the_year,
    week_of_the_year,
```

DATE-RANGE AT MySQL STAGING DATABASE

DATE TRANSFORMATION HIGHLIGHTS



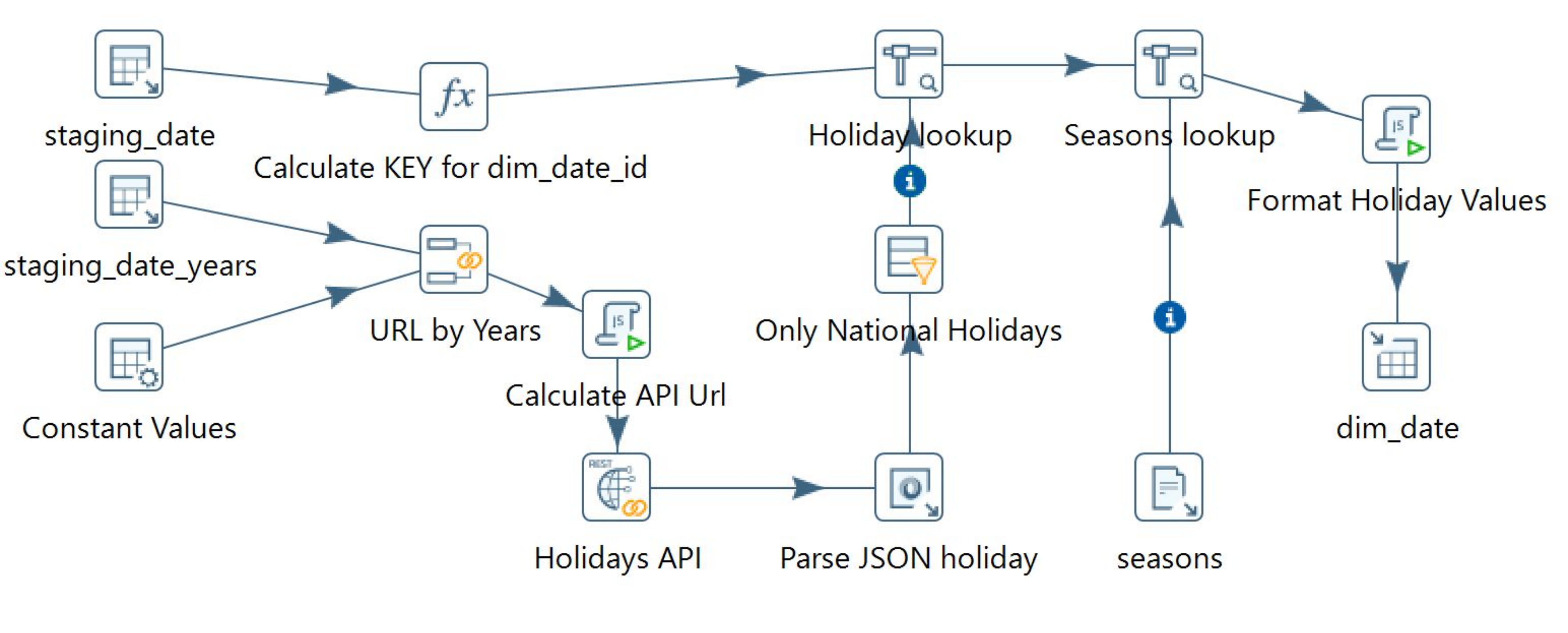
Nager Date Spain 2020

GET https://date.nager.at/api/v2/PublicHolidays/2020/ES

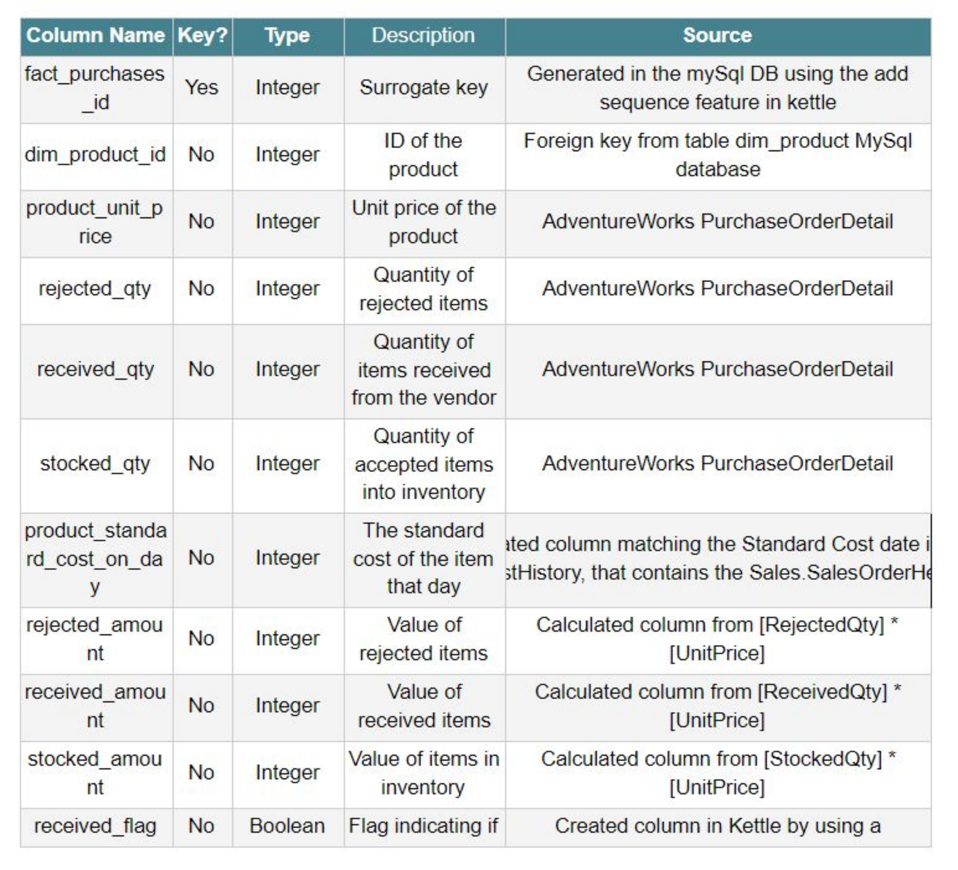
```
[
    {
        "date": "2020-01-01",
        "localName": "Año Nuevo",
        "name": "New Year's Day",
        "countryCode": "ES",
        "fixed": true,
        "global": true,
        "counties": null,
        "launchYear": 1967,
        "type": "Public"
    },
    {
        "date": "2020-01-06",
        "localName": "Día de Reyes / Epifanía del Señor",
        "name": "Epiphany",
```

HOLIDAY API BY YEAR

DATE TRANSFORMATION HIGHLIGHTS

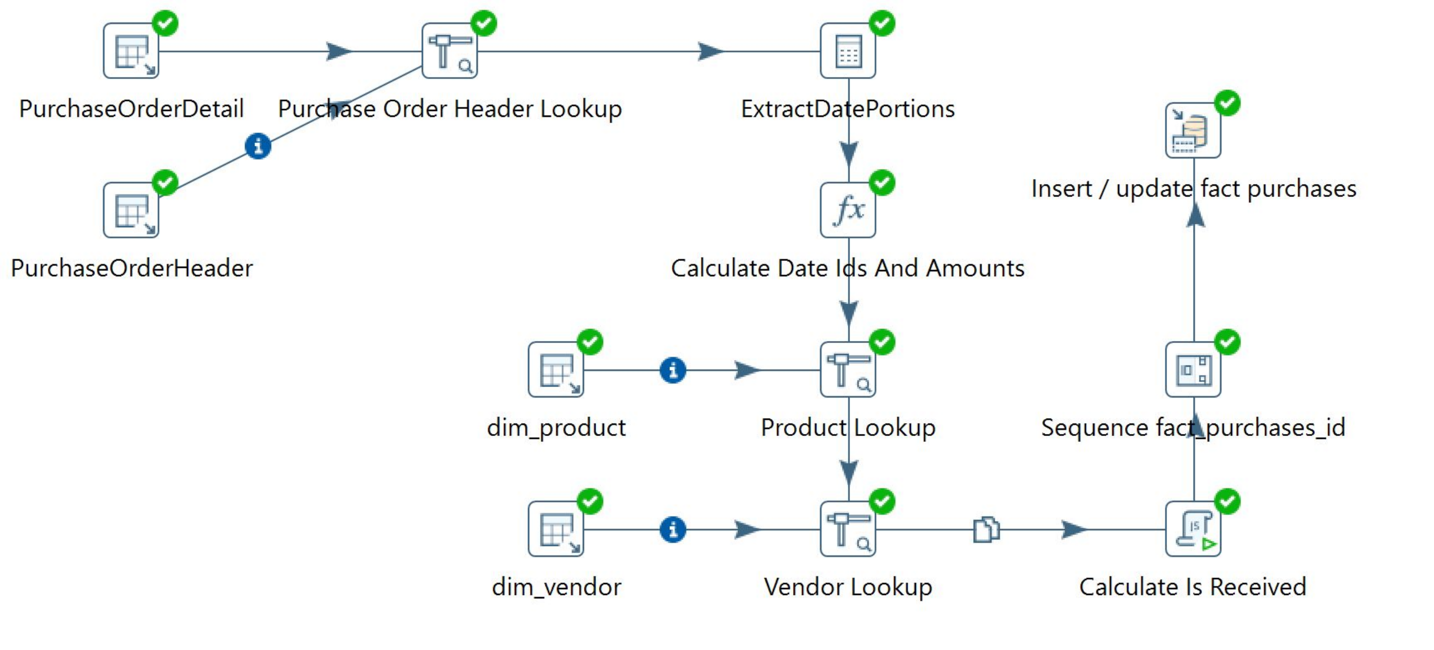


PURCHASES FACT HIGHLIGHTS



Column Name	Key?	Type	Description	Source
fact_purchases_id	Yes	Integer	Surrogate key	Generated in the mySql DB using the add sequence feature in kettle
dim_product_id	No	Integer	ID of the product	Foreign key from table dim_product MySql database
product_unit_price	No	Integer	Unit price of the product	AdventureWorks PurchaseOrderDetail
rejected_qty	No	Integer	Quantity of rejected items	AdventureWorks PurchaseOrderDetail
received_qty	No	Integer	Quantity of items received from the vendor	AdventureWorks PurchaseOrderDetail
stocked_qty	No	Integer	Quantity of accepted items into inventory	AdventureWorks PurchaseOrderDetail
product_standard_cost_on_day	No	Integer	The standard cost of the item that day	ated column matching the Standard Cost date i stHistory, that contains the Sales.SalesOrderHe
rejected_amount	No	Integer	Value of rejected items	Calculated column from [RejectedQty] * [UnitPrice]
received_amount	No	Integer	Value of received items	Calculated column from [ReceivedQty] * [UnitPrice]
stocked_amount	No	Integer	Value of items in inventory	Calculated column from [StockedQty] * [UnitPrice]
received_flag	No	Boolean	Flag indicating if	Created column in Kettle by using a

PURCHASES TRANSFORMATION HIGHLIGHTS



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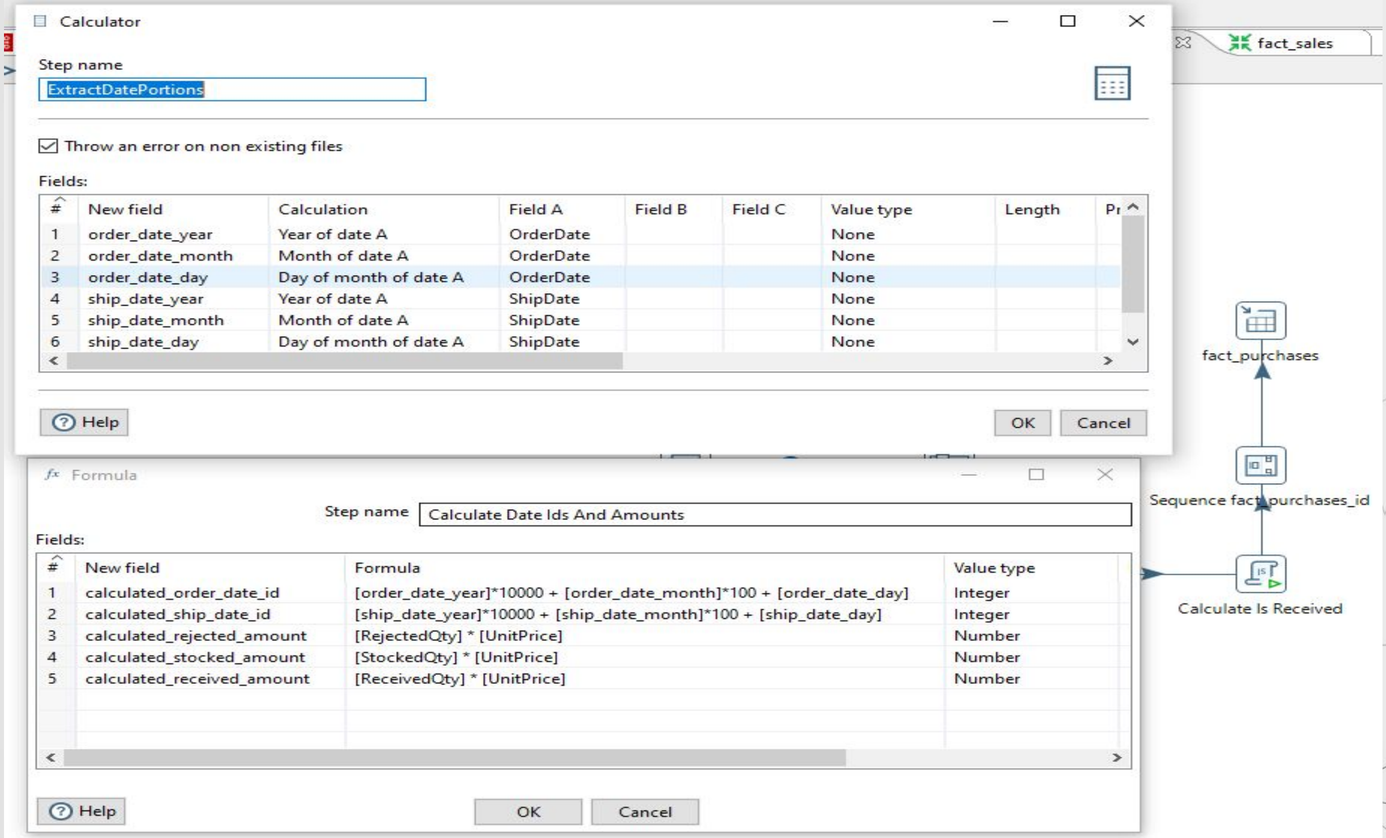


Calculator

Step name: ExtractDatePortions

☑ Throw an error on non existing files

Fields:

#	New field	Calculation	Field A	Field B	Field C	Value type	Length	Pr
1	order_date_year	Year of date A	OrderDate			None		
2	order_date_month	Month of date A	OrderDate			None		
3	order_date_day	Day of month of date A	OrderDate			None		
4	ship_date_year	Year of date A	ShipDate			None		
5	ship_date_month	Month of date A	ShipDate			None		
6	ship_date_day	Day of month of date A	ShipDate			None		

Help   OK   Cancel

Formula

Step name: Calculate Date Ids And Amounts

Fields:

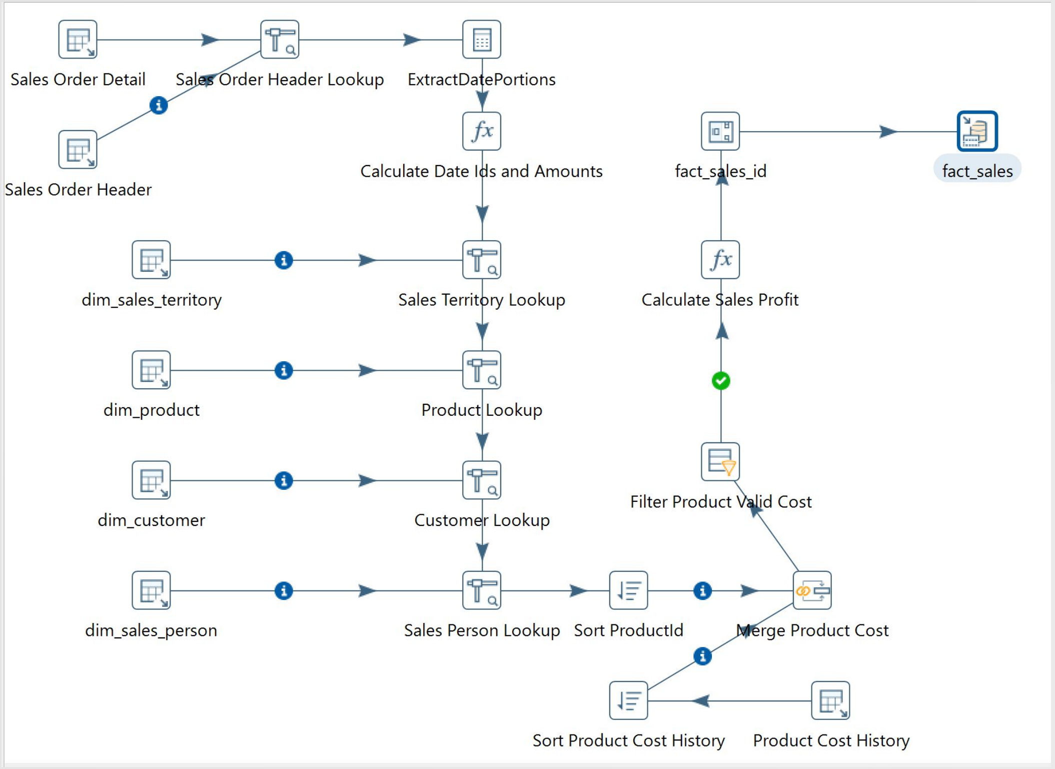
#	New field	Formula	Value type
1	calculated_order_date_id	[order_date_year]*10000 + [order_date_month]*100 + [order_date_day]	Integer
2	calculated_ship_date_id	[ship_date_year]*10000 + [ship_date_month]*100 + [ship_date_day]	Integer
3	calculated_rejected_amount	[RejectedQty] * [UnitPrice]	Number
4	calculated_stocked_amount	[StockedQty] * [UnitPrice]	Number
5	calculated_received_amount	[ReceivedQty] * [UnitPrice]	Number

Help   OK   Cancel

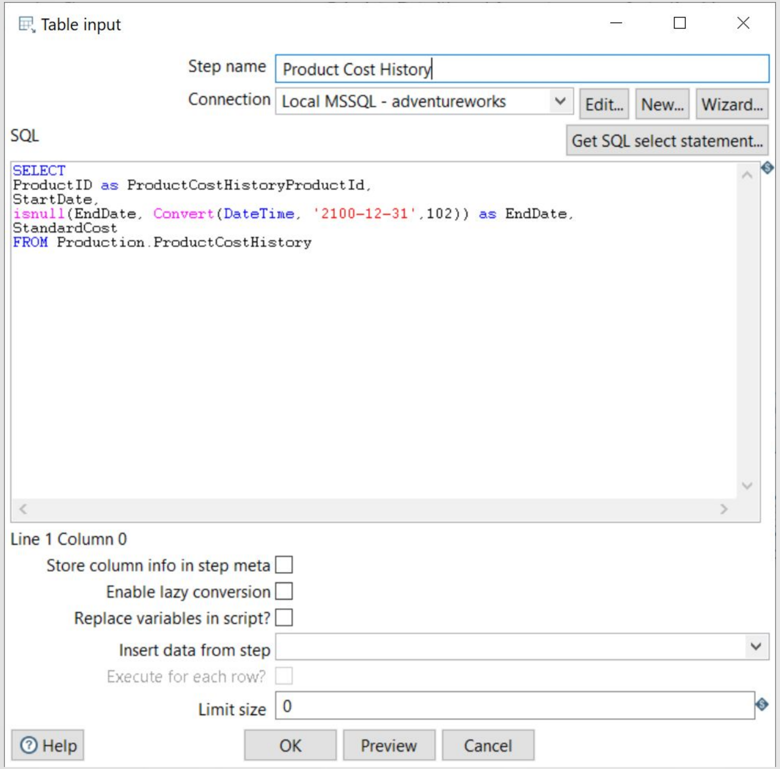
SALES FACT HIGHLIGHTS

Column Name	Key ?	Description	Source
fact_sales_id	Yes	Surrogate key	Generated by “Add sequence” in Kettle
product_standard_cost_on_day	No	The standard cost for the product that day	Calculated in Kettle
sales_profit	No	Profit of sale	Calculated in Kettle

SALES TRANSFORMATION HIGHLIGHTS



SALES FACT HIGHLIGHTS



Step name: Product Cost History

Connection: Local MSSQL - adventureworks

SQL

```
SELECT
ProductID as ProductCostHistoryProductId,
StartDate,
isnull(EndDate, Convert(DateTime, '2100-12-31',102)) as EndDate,
StandardCost
FROM Production.ProductCostHistory
```

Line 1 Column 0

Store column info in step meta ☐

Enable lazy conversion ☐

Replace variables in script? ☐

Insert data from step:

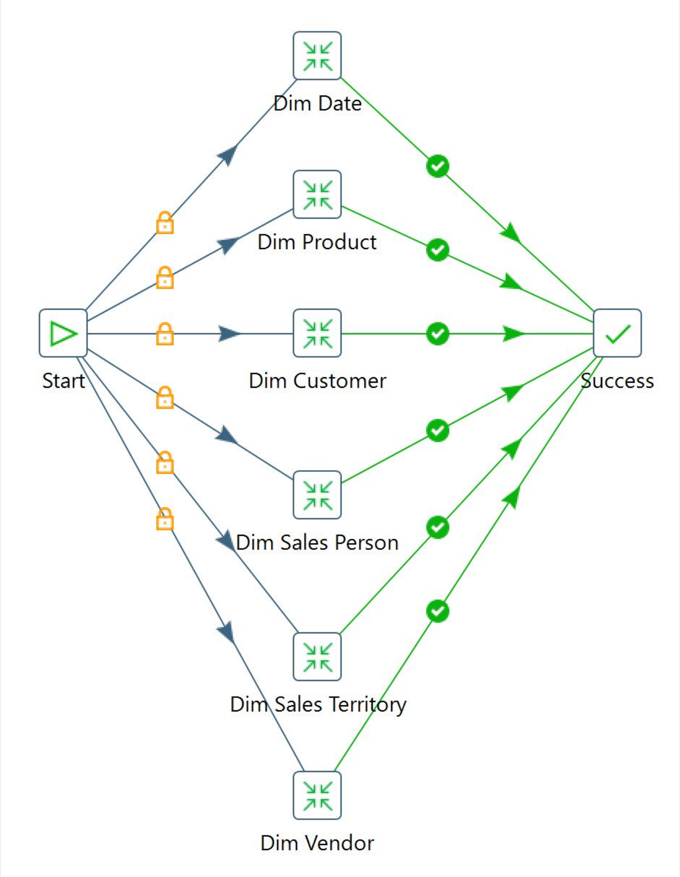
Execute for each row? ☐

Limit size: 0

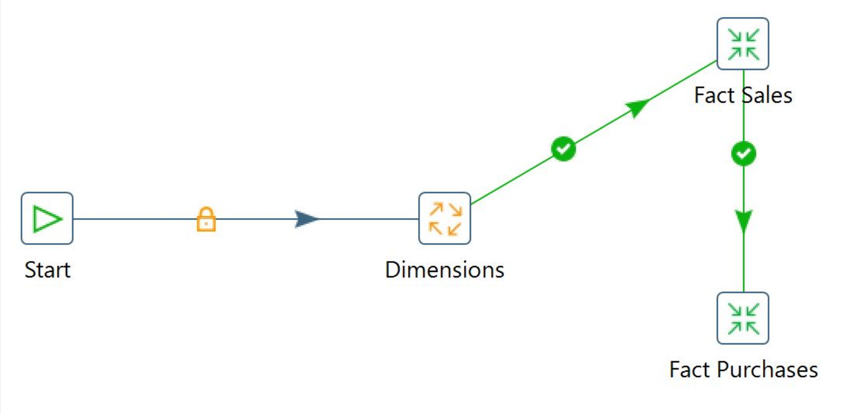
Product Standard Cost

JOBS

DIMENSIONS

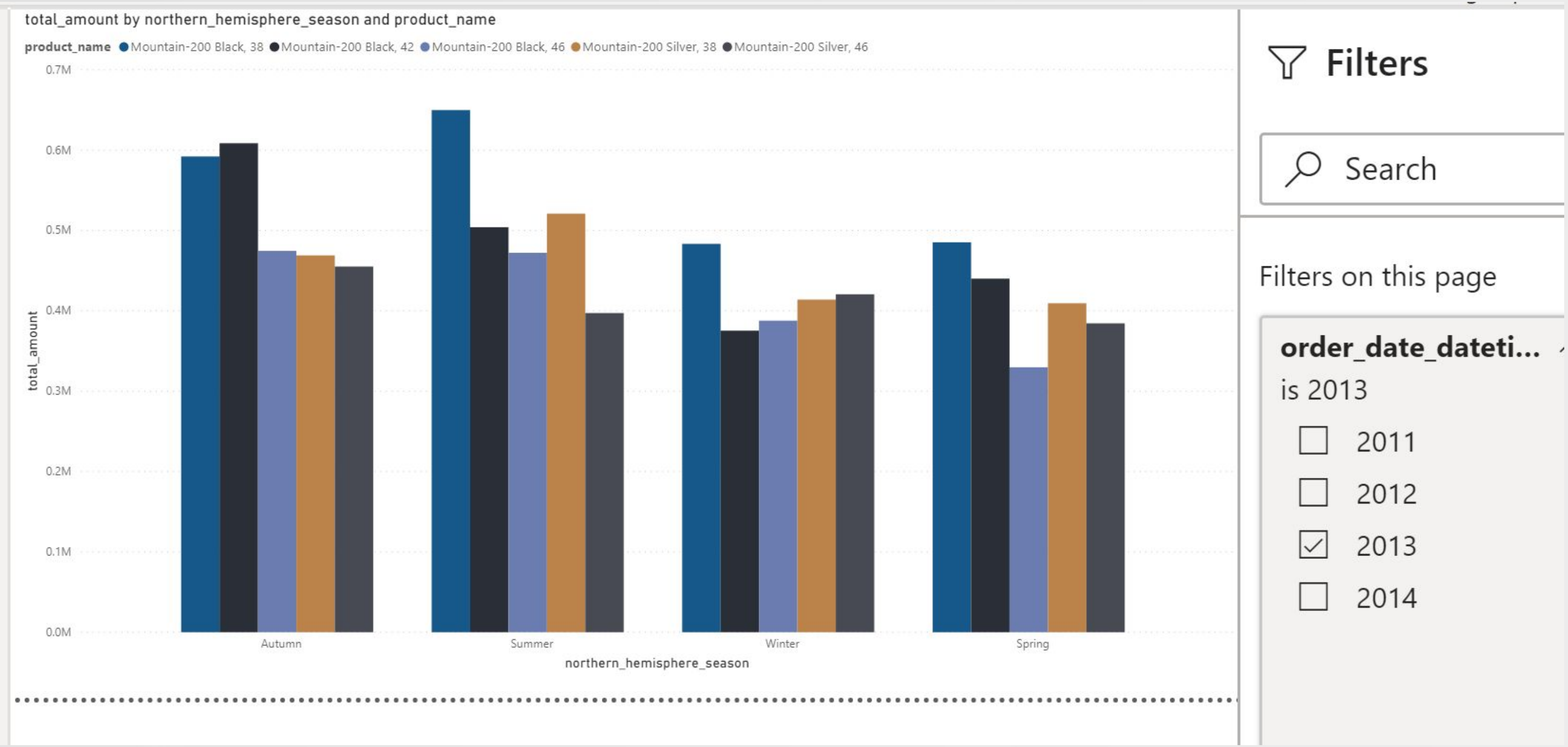


FACTS



SEASONAL SALES

Create top 5 products sales ranking by seasons.


total_amount by northern_hemisphere_season and product_name
product_name ● Mountain-200 Black, 38 ● Mountain-200 Black, 42 ● Mountain-200 Black, 46 ● Mountain-200 Silver, 38 ● Mountain-200 Silver, 46
0.7M
0.6M
0.5M
0.4M
0.3M
0.2M
0.1M
0.0M
total_amount
Autumn
Summer
Winter
Spring
northern_hemisphere_season
Filters
Search

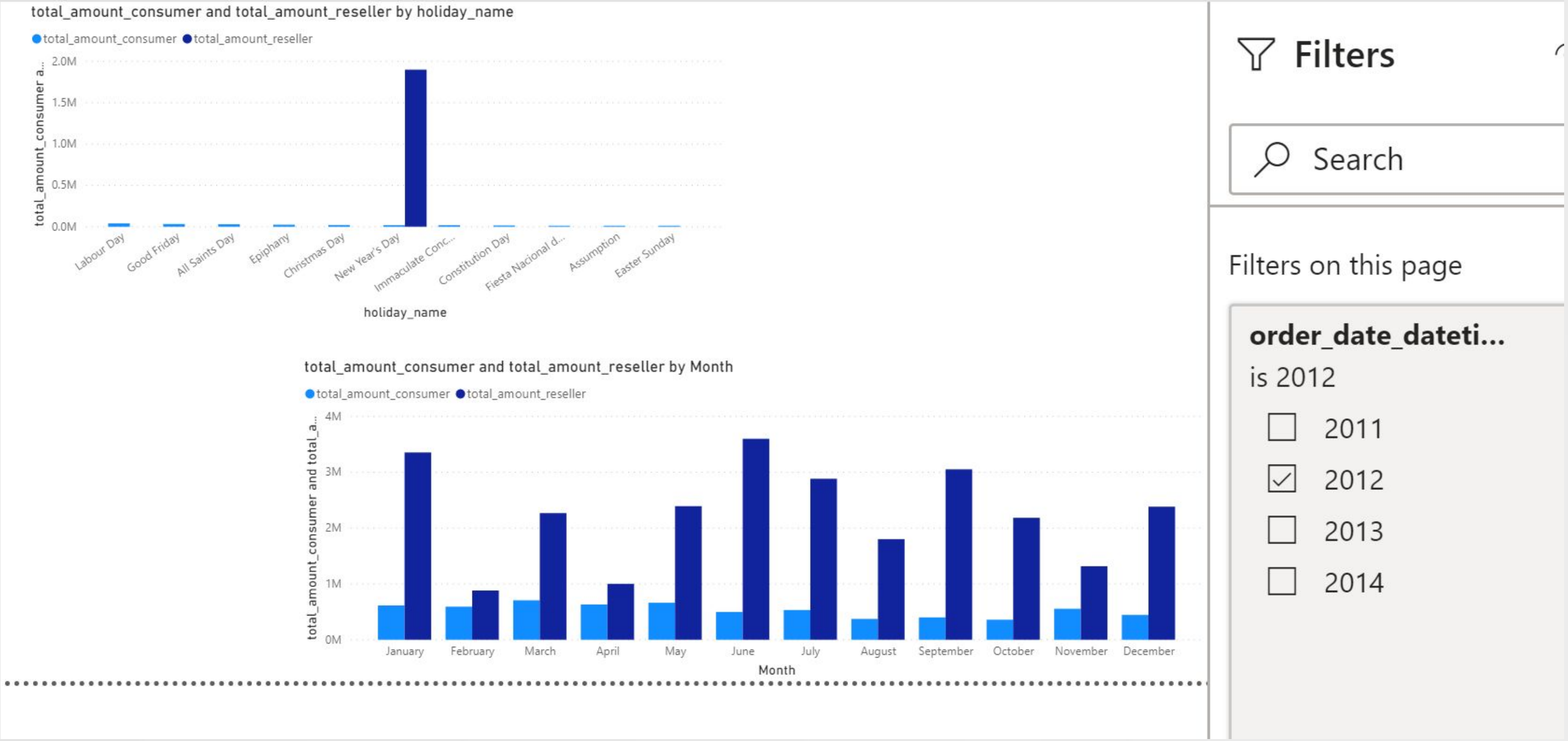
Filters on this page

order_date_dateti...
is 2013

□ 2011
□ 2012
☑ 2013
□ 2014

HOLIDAY SALES

Reseller sales vs direct consumer sales
over specific holiday days.



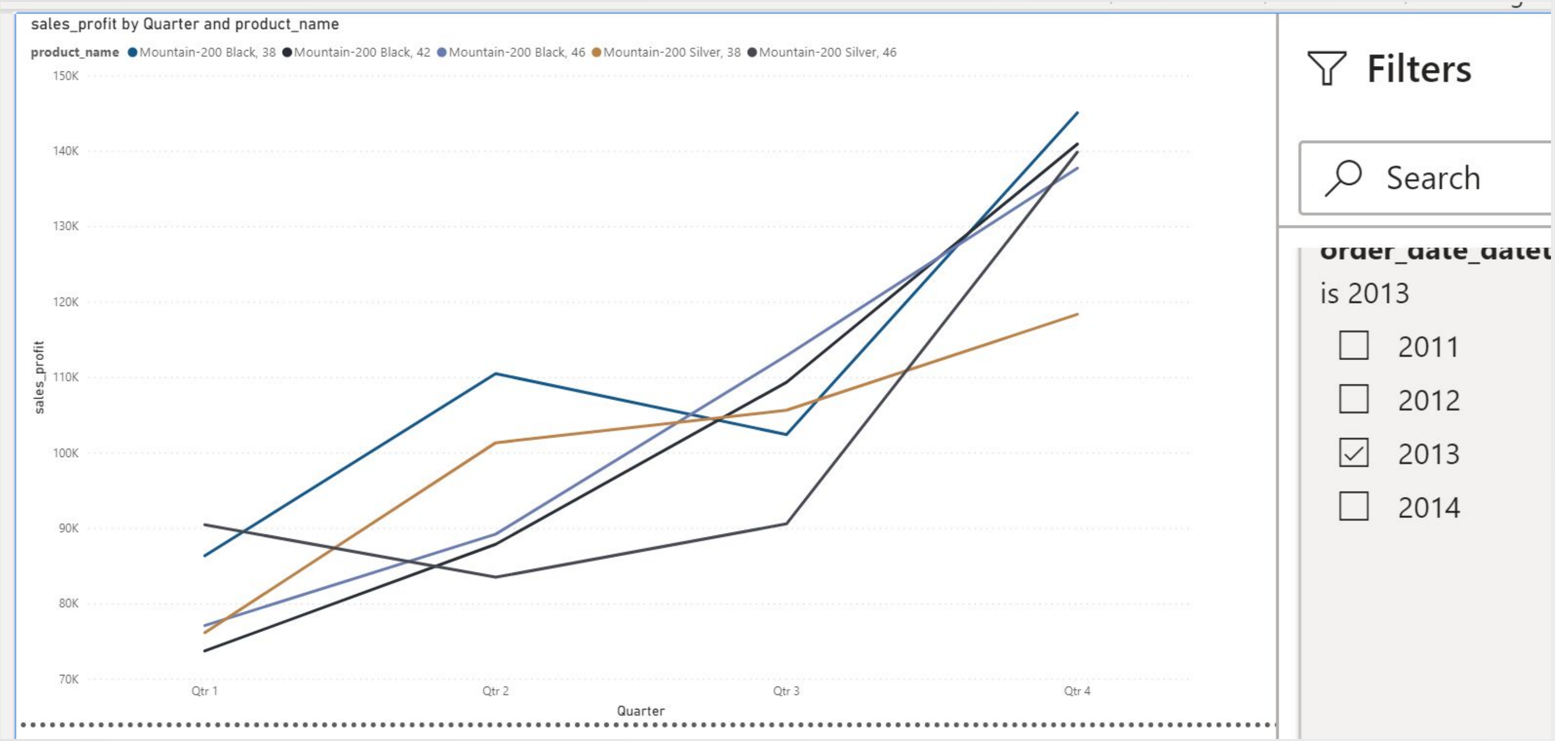
Filters on this page

order_date_dateti...
is 2012

- □ 2011
- ☑ 2012
- □ 2013
- □ 2014

PRODUCT PROFITABILITY

Create top 5 products profit ranking, quarter by quarter


sales_profit by Quarter and product_name
product_name ● Mountain-200 Black, 38 ● Mountain-200 Black, 42 ● Mountain-200 Black, 46 ● Mountain-200 Silver, 38 ● Mountain-200 Silver, 46
150K
140K
130K
120K
110K
100K
90K
80K
70K
sales_profit
Qtr 1
Qtr 2
Qtr 3
Qtr 4
Quarter
Filters
Search

order_date_datet

is 2013

□ 2011

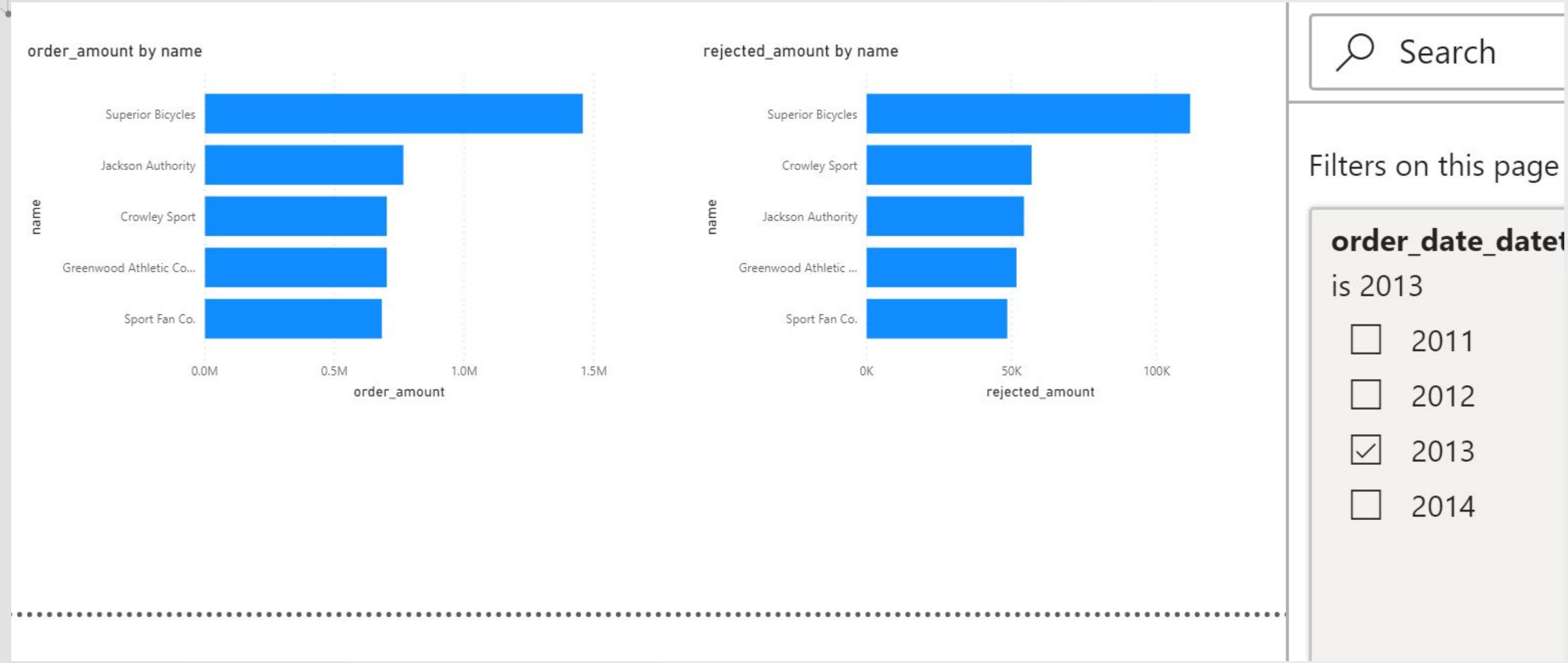
□ 2012

☑ 2013

□ 2014

REJECTED ITEMS

Create a top 5 Vendor ranking of rejected items on purchase orders.



Filters on this page

order_date_datet

is 2013

□ 2011

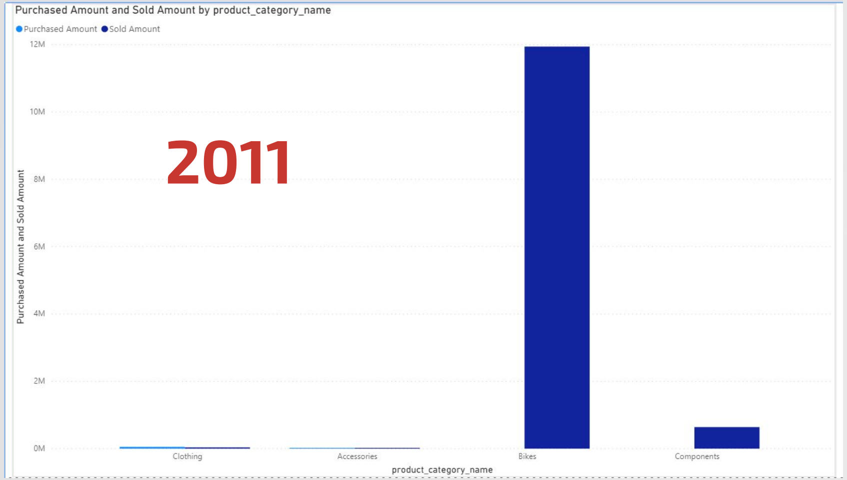
□ 2012

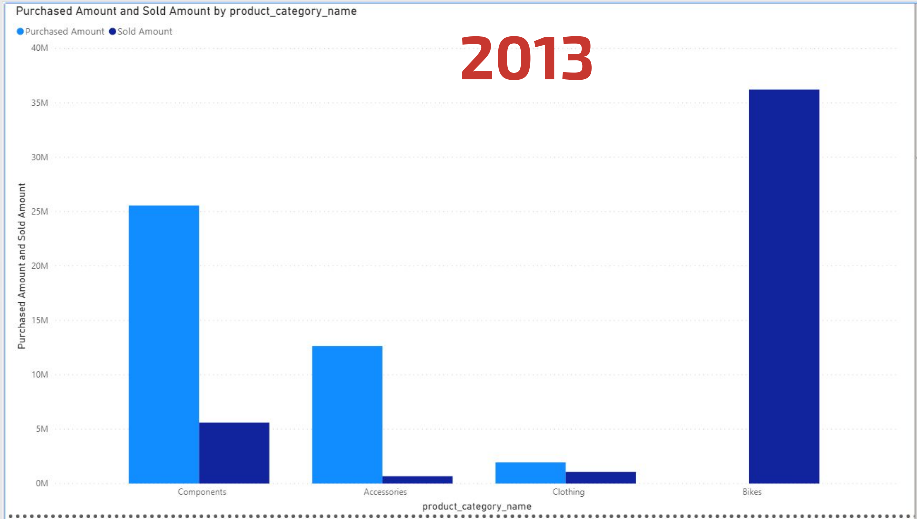
☑ 2013

□ 2014

PURCHASED VS SOLD

Sold items vs purchased items,
for each product category





Thank You