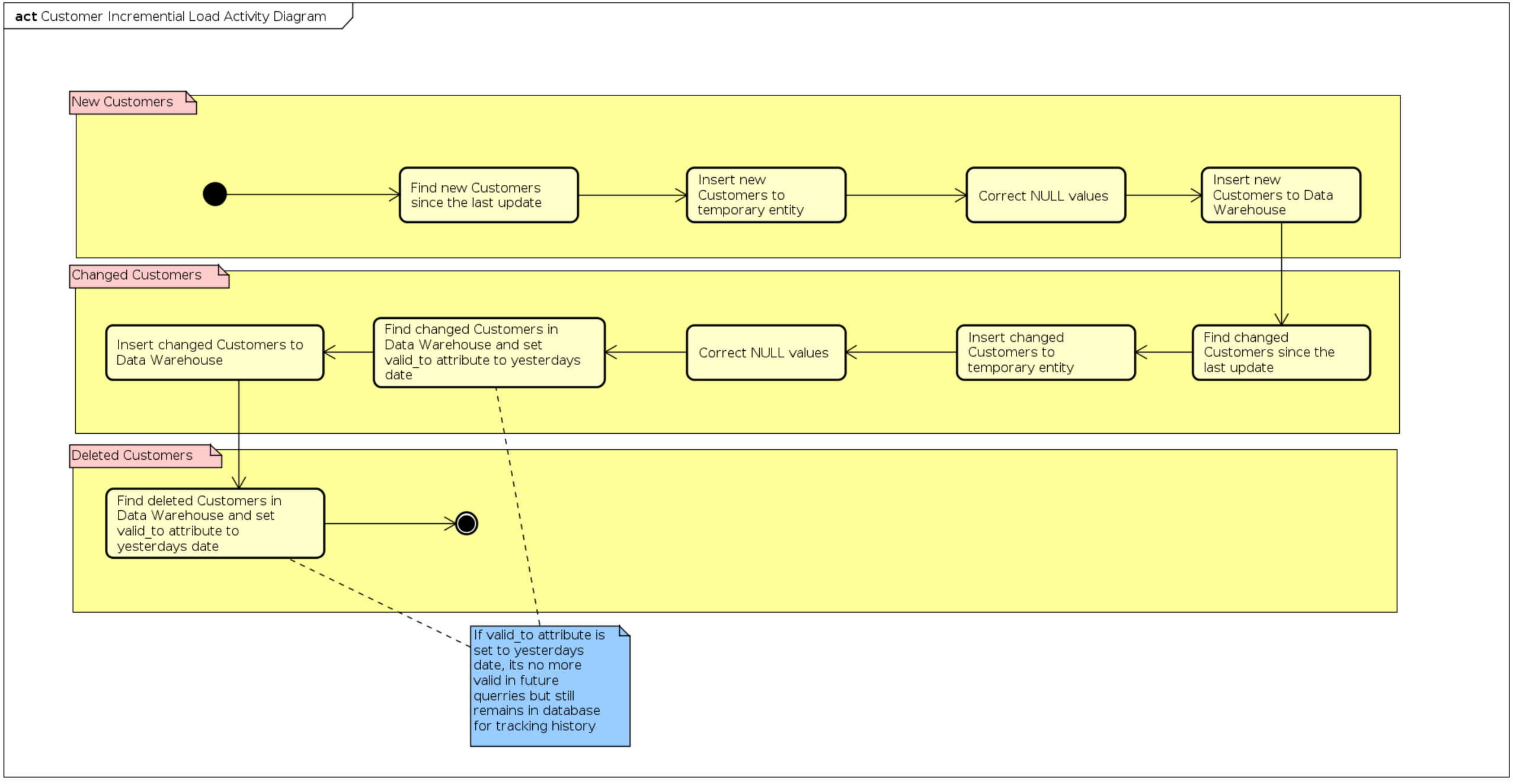
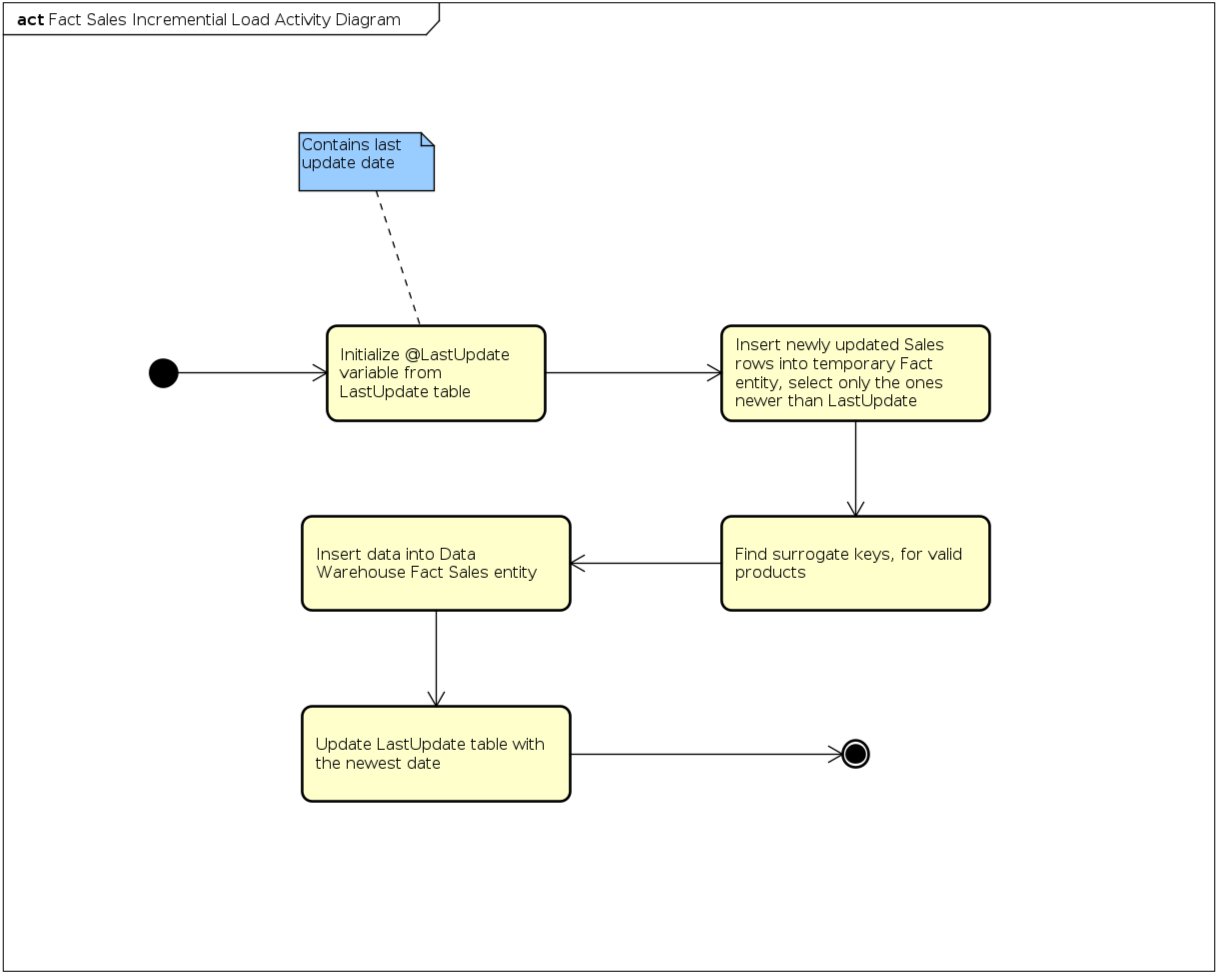
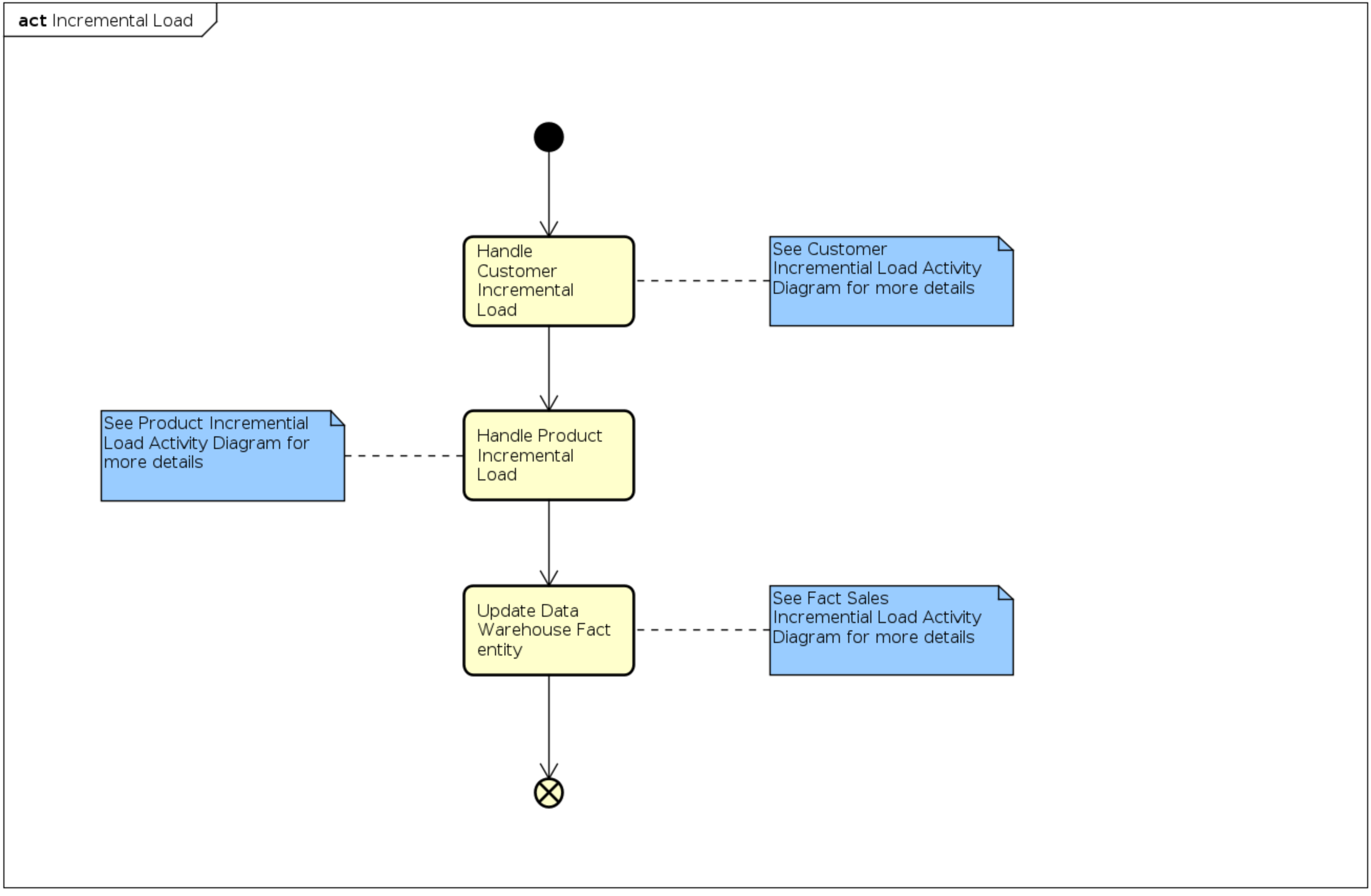
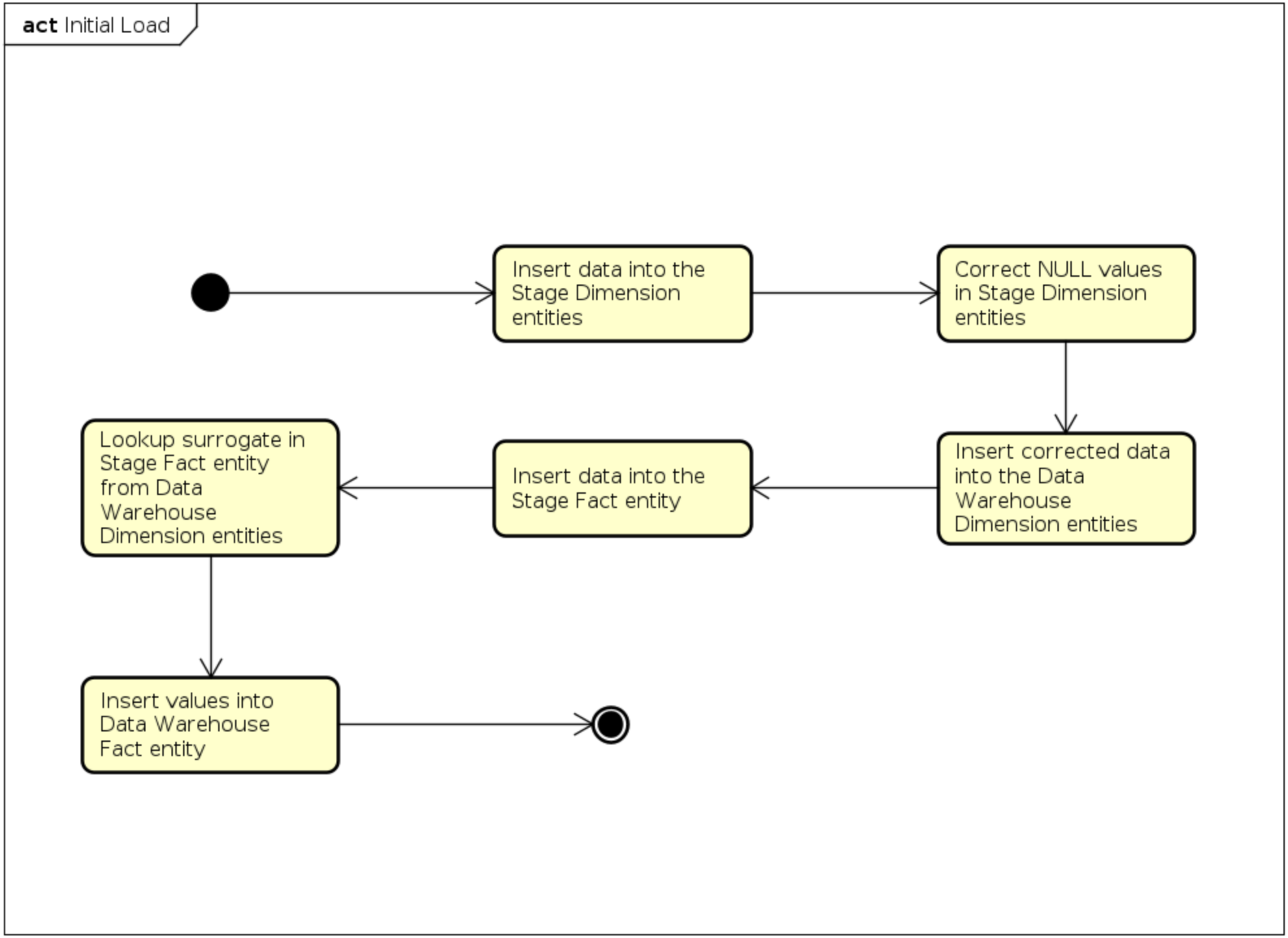
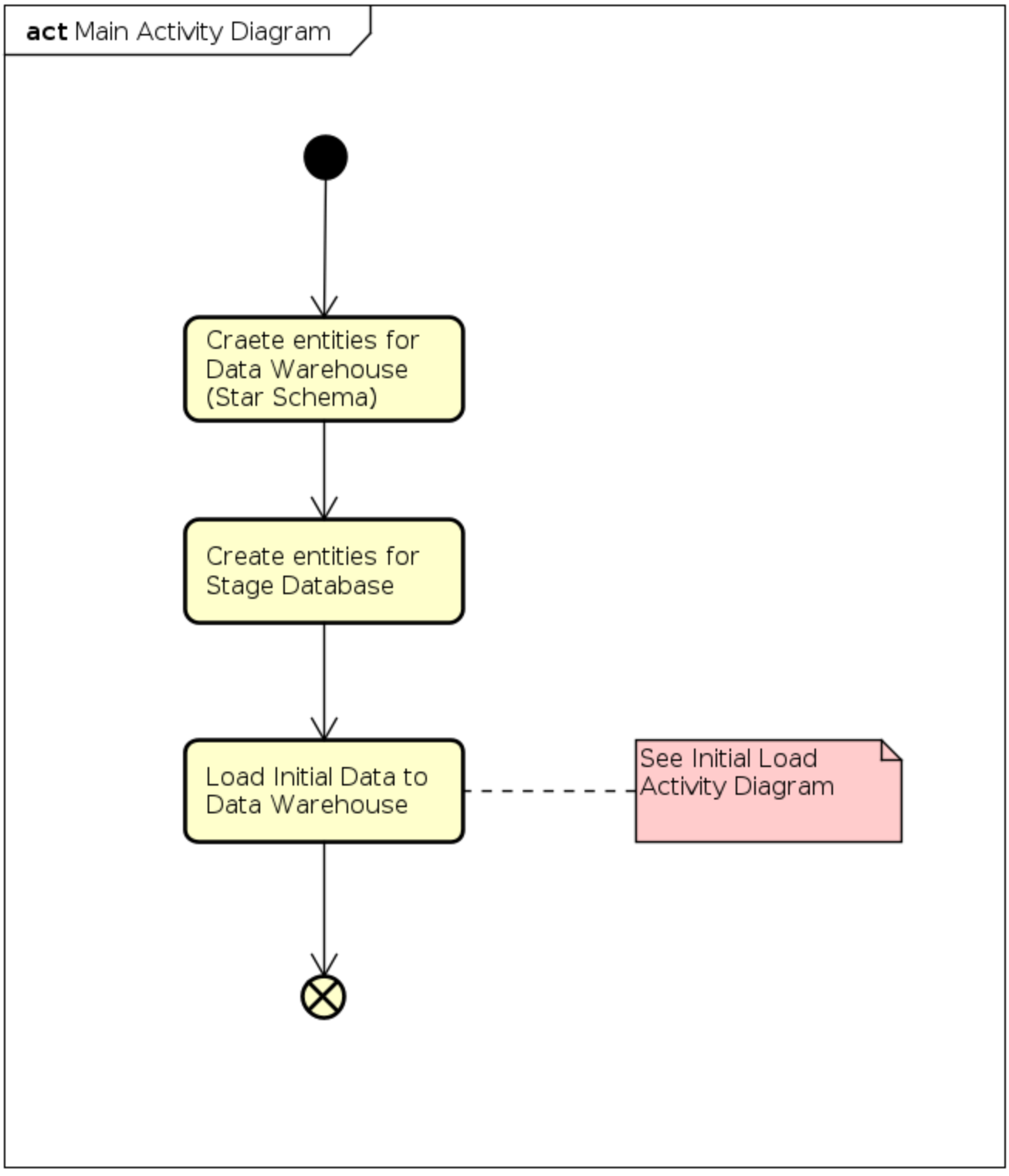
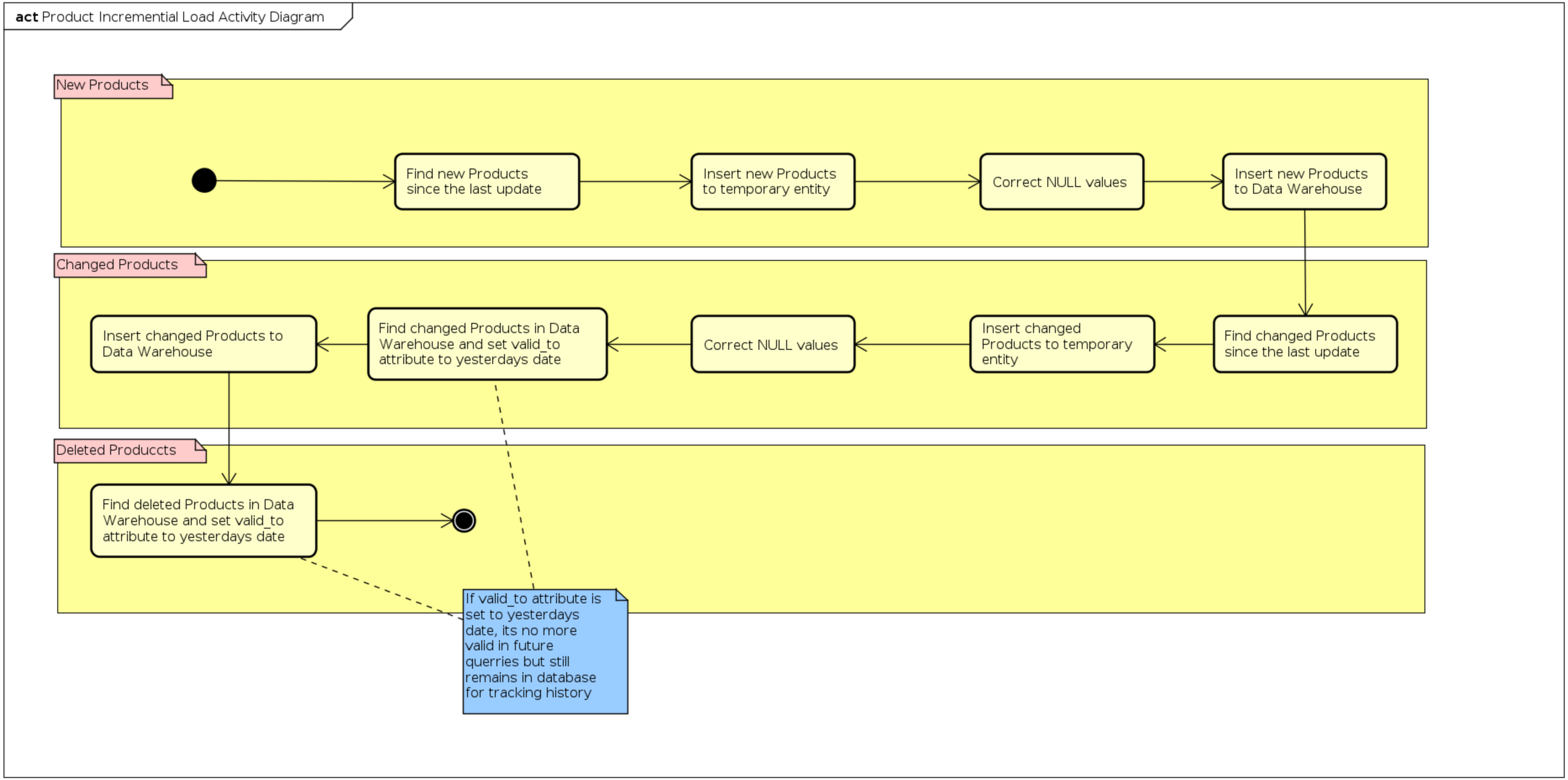

act Customer Incremential Load Activity Diagram
New Customers
Find new Customers since the last update
Insert new Customers to temporary entity
Correct NULL values
Insert new Customers to Data Warehouse
Changed Customers
Insert changed Customers to Data Warehouse
Find changed Customers in Data Warehouse and set valid_to attribute to yesterdays date
Correct NULL values
Insert changed Customers to temporary entity
Find changed Customers since the last update
Deleted Customers
Find deleted Customers in Data Warehouse and set valid_to attribute to yesterdays date
If valid_to attribute is set to yesterdays date, its no more valid in future querries but still remains in database for tracking history

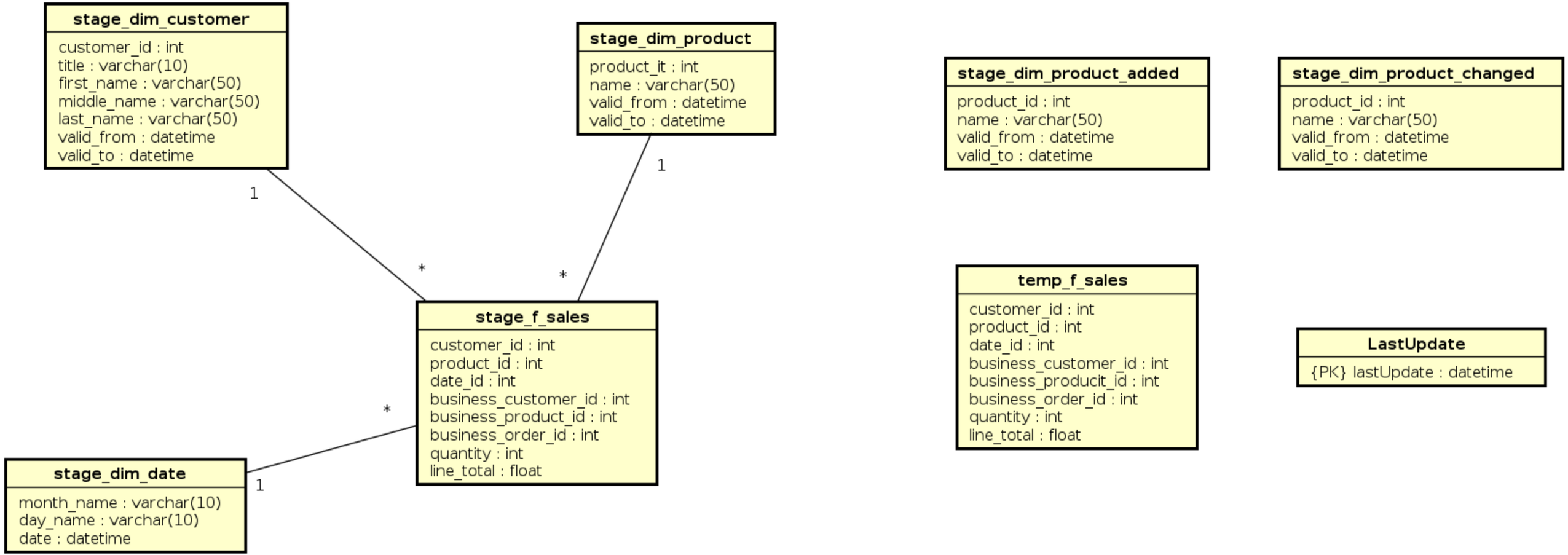

act Fact Sales Incremential Load Activity Diagram
Contains last update date
Initialize @LastUpdate variable from LastUpdate table
Insert newly updated Sales rows into temporary Fact entity, select only the ones newer than LastUpdate
Find surrogate keys, for valid products
Insert data into Data Warehouse Fact Sales entity
Update LastUpdate table with the newest date

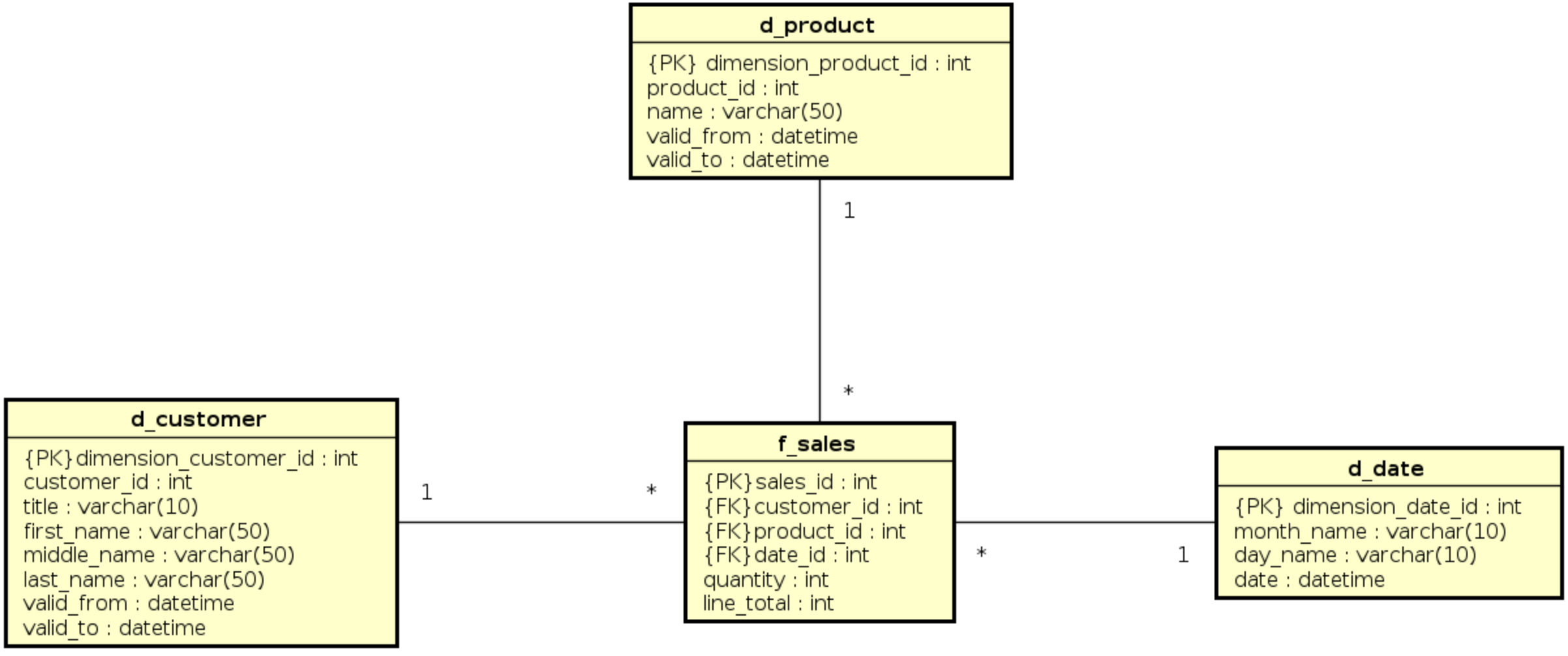

act Incremental Load
Handle Customer Incremental Load
See Customer Incremental Load Activity Diagram for more details
See Product Incremental Load Activity Diagram for more details
Handle Product Incremental Load
Update Data Warehouse Fact entity
See Fact Sales Incremental Load Activity Diagram for more details


act Initial Load
Insert data into the Stage Dimension entities
Correct NULL values in Stage Dimension entities
Insert corrected data into the Data Warehouse Dimension entities
Insert data into the Stage Fact entity
Lookup surrogate in Stage Fact entity from Data Warehouse Dimension entities
Insert values into Data Warehouse Fact entity


act Main Activity Diagram
Craete entities for Data Warehouse (Star Schema)
Create entities for Stage Database
Load Initial Data to Data Warehouse
See Initial Load Activity Diagram


act Product Incremential Load Activity Diagram
New Products
Find new Products since the last update
Insert new Products to temporary entity
Correct NULL values
Insert new Products to Data Warehouse
Changed Products
Find changed Products since the last update
Insert changed Products to temporary entity
Correct NULL values
Find changed Products in Data Warehouse and set valid_to attribute to yesterdays date
Insert changed Products to Data Warehouse
Deleted Produccts
Find deleted Products in Data Warehouse and set valid_to attribute to yesterdays date
If valid_to attribute is set to yesterdays date, its no more valid in future querries but still remains in database for tracking history


stage_dim_customer
customer_id : int
title : varchar(10)
first_name : varchar(50)
middle_name : varchar(50)
last_name : varchar(50)
valid_from : datetime
valid_to : datetime
stage_dim_product
product_it : int
name : varchar(50)
valid_from : datetime
valid_to : datetime
stage_dim_product_added
product_id : int
name : varchar(50)
valid_from : datetime
valid_to : datetime
stage_dim_product_changed
product_id : int
name : varchar(50)
valid_from : datetime
valid_to : datetime
1
1
*
*
stage_f_sales
customer_id : int
product_id : int
date_id : int
business_customer_id : int
business_product_id : int
business_order_id : int
quantity : int
line_total : float
temp_f_sales
customer_id : int
product_id : int
date_id : int
business_customer_id : int
business_producit_id : int
business_order_id : int
quantity : int
line_total : float
LastUpdate
{PK} lastUpdate : datetime
*
1
stage_dim_date
month_name : varchar(10)
day_name : varchar(10)
date : datetime


d_product
{PK} dimension_product_id : int
product_id : int
name : varchar(50)
valid_from : datetime
valid_to : datetime
1
*
d_customer
{PK}dimension_customer_id : int
customer_id : int
title : varchar(10)
first_name : varchar(50)
middle_name : varchar(50)
last_name : varchar(50)
valid_from : datetime
valid_to : datetime
1
*
f_sales
{PK}sales_id : int
{FK}customer_id : int
{FK}product_id : int
{FK}date_id : int
quantity : int
line_total : int
*
1
d_date
{PK} dimension_date_id : int
month_name : varchar(10)
day_name : varchar(10)
date : datetime

```sql
--This statement creates dimension table d_customer with attributes and primary key is assigned to
dimension_customer_id

CREATE TABLE AdventureWorks_DW.star_schema.d_customer
(
    dimension_customer_id INT         NOT NULL IDENTITY,
    customer_id           INT         NOT NULL,
    title                 varchar(10) NOT NULL,
    first_name            varchar(50) NOT NULL,
    middle_name           varchar(50) NOT NULL,
    last_name             varchar(50) NOT NULL,
    valid_from            DATETIME    NOT NULL,
    valid_to              DATETIME    NOT NULL,
    PRIMARY KEY (dimension_customer_id)
);
--This statement creates dimension table d_product with attributes and primary key is assigned to
dimension_product_id
CREATE TABLE AdventureWorks_DW.star_schema.d_product
(
    dimension_product_id INT         NOT NULL IDENTITY,
    product_id           INT         NOT NULL,
    name                 varchar(50) NOT NULL,
    valid_from           DATETIME    NOT NULL,
    valid_to             DATETIME    NOT NULL,
    PRIMARY KEY (dimension_product_id)
);
--This statement creates dimension table d_date with attributes and primary key is assigned to
dimension_date_id
CREATE TABLE AdventureWorks_DW.star_schema.d_date
(
    dimension_date_id INT         NOT NULL IDENTITY,
    month_name        varchar(10) NOT NULL,
    day_name          varchar(10) NOT NULL,
    date              date        NOT NULL,
    PRIMARY KEY (dimension_date_id)
);

--This statement creates fact table f_sales with attributes, primary key is assigned to sales_id and
foreign keys customer_id, product_id
CREATE TABLE AdventureWorks_DW.star_schema.f_sales
(
    sales_id    INT NOT NULL IDENTITY,
    customer_id INT NOT NULL,
    product_id  INT NOT NULL,
    date_id     INT NOT NULL,
    quantity    INT NOT NULL,
    line_total  INT NOT NULL,
    PRIMARY KEY (sales_id),
    FOREIGN KEY (customer_id) REFERENCES AdventureWorks_DW.star_schema.d_customer (dimension_customer_id),
    FOREIGN KEY (product_id) REFERENCES AdventureWorks_DW.star_schema.d_product (dimension_product_id),
    FOREIGN KEY (date_id) REFERENCES AdventureWorks_DW.star_schema.d_date (dimension_date_id)
);
```

```
-- ********************************************
-- ************ CREATING STAGE TABLES ************
-- ********************************************
--This statement creates staging dimension table stage_dim_customer with attributes and assigned
-- primary key as customer_id
CREATE TABLE StagingDatabase.staging.stage_dim_customer
(
    customer_id           INT NOT NULL,
    title                 varchar(10),
    first_name            varchar(50),
    middle_name           varchar(50),
    last_name             varchar(50),
    valid_from            DATETIME,
    valid_to              DATETIME,
);
--This statement creates staging dimension table stage_dim_product with attributes and assigned
-- primary key as dimension_product_id
CREATE TABLE StagingDatabase.staging.stage_dim_product
(
    product_id           INT,
    name                 varchar(50),
    valid_from           DATETIME,
    valid_to             DATETIME,
);
--This statement creates staging dimension table stage_dim_date with attributes and assigned primary
-- key as dimension_date_id
CREATE TABLE StagingDatabase.staging.stage_dim_date
(
    month_name        varchar(10),
    day_name          varchar(10),
    date              DATETIME NOT NULL,
);

-- Create a table which holds last update variable
CREATE TABLE StagingDatabase.staging.LastUpdate
(
    lastUpdate DATETIME DEFAULT GETDATE()
);

--This statement creates staging fact table stage_f_sales with attributes and assigned primary key as
sales_id
CREATE TABLE StagingDatabase.staging.stage_f_sales
(
    customer_id          INT      NULL,
    product_id           INT      NULL,
    date_id              INT      NULL,
    business_customer_id INT      NULL,
    business_product_id  INT      NULL,
    business_order_date  DATETIME NULL,
    quantity             INT      NULL,
    line_total           FLOAT    NULL,
);

-- Create temporary table for f_sales.
CREATE TABLE StagingDatabase.staging.temp_f_sales
(
    customer_id          INT      NULL,
    product_id           INT      NULL,
    date_id              INT      NULL,
    business_customer_id INT      NULL,
    business_product_id  INT      NULL,
    business_order_date  DATETIME NULL,
    quantity             INT      NULL,
    line_total           FLOAT    NULL,
);

-- Create temporary table to store added products so we can handle valid_to attribute
```

```sql
CREATE TABLE StagingDatabase.staging.stage_dim_product_added
(
    product_id           INT,
    name                 varchar(50),
    valid_from           DATETIME,
    valid_to             DATETIME,
);

-- Create temporary table to store updated products so we can handle valid_to attribute and
-- deleting old products
CREATE TABLE StagingDatabase.staging.stage_dim_product_changed
(
    product_id           INT,
    name                 varchar(50),
    valid_from           DATETIME,
    valid_to             DATETIME,
);

-- Create temporary table to store updated customers so we can handle valid_to attribute and
-- deleting old customers
CREATE TABLE StagingDatabase.staging.stage_dim_customer_changed
    (
    customer_id         INT,
    title               varchar(10),
    first_name          varchar(50),
    middle_name          varchar(50),
    last_name          varchar(50),
    valid_from          DATETIME,
    valid_to         DATETIME,

    );
-- Create temporary table to store added customers so we can handle valid_to attribute
CREATE TABLE StagingDatabase.staging.stage_dim_customer_added
    (
    customer_id         INT,
    title               varchar(10),
    first_name          varchar(50),
    middle_name          varchar(50),
    last_name          varchar(50),
    valid_from          DATETIME,
    valid_to         DATETIME,

    );
```

```
-- ****************************************************************
-- ************ INSERTING AND FIXING DATA IN STAGE TABLES ************
-- ****************************************************************

-- _____________________ CUSTOMER _____________________

--This statement inserts attribute values into staging dimension table stage_dim_customer
INSERT INTO StagingDatabase.staging.stage_dim_customer(customer_id, title, first_name, middle_name,
last_name)
SELECT CustomerID, Title, FirstName, MiddleName, LastName
FROM AdventureWorks2017.Sales.Customer
        JOIN AdventureWorks2017.Person.Person ON Customer.PersonID = Person.BusinessEntityID;

--This statement removes null values in the title attribute in stage_dim_customer table by replacing with
'N/A'
UPDATE StagingDatabase.staging.stage_dim_customer
SET title='N/A'
WHERE title IS NULL;

--This statement removes null values in the middle_name attribute in stage_dim_customer table by
replacing with 'N/A'
UPDATE StagingDatabase.staging.stage_dim_customer
SET middle_name='N/A'
WHERE middle_name IS NULL;

-- Create new date for valid_from attribute. It will be the date when it was added to data warehouse
UPDATE StagingDatabase.staging.stage_dim_customer
SET valid_from=GETDATE()
WHERE valid_from IS NULL;

-- This statement replaces all NULL values with date 31.12.9999
UPDATE StagingDatabase.staging.stage_dim_customer
SET valid_to='9999-12-31'
WHERE valid_to IS NULL;


-- _____________________ PRODUCT _____________________

--This statement inserts attribute values into staging dimension table stage_dim_product
INSERT INTO StagingDatabase.staging.stage_dim_product(product_id, name, valid_from, valid_to)
SELECT ProductID, Name, SellStartDate, SellEndDate
from AdventureWorks2017.Production.Product;

--This statement removes null values in the name attribute in stage_dim_product table by replacing with
'N/A'
UPDATE StagingDatabase.staging.stage_dim_product
SET name='N/A'
WHERE name IS NULL;

-- This statement replaces all NULL values with date 31.12.9999
UPDATE StagingDatabase.staging.stage_dim_product
SET valid_to='9999-12-31'
WHERE valid_to IS NULL;


-- _____________________ DATE _____________________

--This statement inserts attribute values unto staging dimension table stage_dim_date
DECLARE @StartDate DATETIME = '2011-05-31'
DECLARE @EndDate DATETIME = '2014-06-30'

WHILE @StartDate <= @EndDate
    BEGIN
        INSERT INTO StagingDatabase.staging.stage_dim_date (date,
                                                            day_name,
                                                            month_name)
        SELECT @StartDate,
```

```
                DATENAME(weekday, @StartDate),
                DATENAME(month, @StartDate)

        SET @StartDate = DATEADD(dd, 1, @StartDate)
    END

-- ************************************************************************
-- ************ INSERTING FIXED DATA INTO DW DIMENSION TABLES ************
-- ************************************************************************

--This statement inserts attribute vales into dimension d_product table
INSERT INTO AdventureWorks_DW.star_schema.d_product (product_id, name, valid_from, valid_to)
SELECT *
FROM StagingDatabase.staging.stage_dim_product;

--This statement inserts attribute vales into dimension d_customer table
INSERT INTO AdventureWorks_DW.star_schema.d_customer (customer_id, title, first_name, middle_name,
last_name,
                                                      valid_from, valid_to)
SELECT *
FROM StagingDatabase.staging.stage_dim_customer;

--This statement inserts attribute vales into dimension d_date table
INSERT INTO AdventureWorks_DW.star_schema.d_date (month_name, day_name, date)
SELECT *
FROM StagingDatabase.staging.stage_dim_date;


-- ************************************************************
-- ************ INSERTING FIXED DATA INTO FACT TABLES ************
-- ************************************************************

--This statement inserts attribute values into staging fact table stage_f_sales
INSERT INTO StagingDatabase.staging.stage_f_sales(business_customer_id, business_product_id,
business_order_date,
                                                  quantity, line_total)
    (SELECT C.CustomerID, P.ProductID, OrderDate, SOD.OrderQty, SOD.LineTotal
     FROM AdventureWorks2017.Sales.SalesOrderHeader SOH
              JOIN AdventureWorks2017.Sales.SalesOrderDetail SOD on SOH.SalesOrderID = SOD.SalesOrderID
              JOIN AdventureWorks2017.Sales.Customer C on SOH.CustomerID = C.CustomerID
              JOIN AdventureWorks2017.Production.Product P on SOD.ProductID = P.ProductID
     WHERE OnlineOrderFlag = 1);


-- ************************************************************************
-- ********************** LOOKUP SURROGATE KEYS **********************
-- ************************************************************************

--This statement extracts the customer_id from staging dimension table stage_dim_customer and assigns it
to the
-- customer_id attribute in stage_f_sales table when the value is null
UPDATE StagingDatabase.staging.stage_f_sales
SET customer_id = (SELECT dimension_customer_id
                   FROM AdventureWorks_DW.star_schema.d_customer AS dim_C_id
                   WHERE dim_C_id.customer_id = business_customer_id)
WHERE customer_id IS NULL;

--This statement extracts the product_id from staging dimension table stage_dim_product and assigns it to
the
-- product_id attribute in stage_f_sales table when the value is null
UPDATE StagingDatabase.staging.stage_f_sales
SET product_id = (SELECT dimension_product_id
                  FROM AdventureWorks_DW.star_schema.d_product AS dim_P_id
                  WHERE dim_P_id.product_id = business_product_id)
WHERE product_id IS NULL;

--This statement extracts the date_id from staging dimension table stage_dim_date and assigns it to the
```

```sql
-- date_id attribute in stage_f_sales table when the value is null
UPDATE StagingDatabase.staging.stage_f_sales
SET date_id = (SELECT dimension_date_id
               FROM AdventureWorks_DW.star_schema.d_date AS dim_D_id
               WHERE dim_D_id.date = business_order_date)
WHERE date_id IS NULL;


-- ********************************************************************************************
-- ********************** INSERT VALUES INTO DATA WAREHOUSE FACT TABLE **********************
-- ********************************************************************************************

INSERT INTO AdventureWorks_DW.star_schema.f_sales(customer_id, product_id, date_id, quantity, line_total)
SELECT customer_id, product_id, date_id, quantity, line_total
FROM StagingDatabase.staging.stage_f_sales;
```

```sql
-- ************************************************************************************************
-- ************************************ NEW PRODUCTS ************************************
-- ************************************************************************************************

-- Search and insert newly added product into staging added product table
INSERT INTO StagingDatabase.staging.stage_dim_product_added (product_id, name, valid_from, valid_to)
SELECT ProductID, Name, SellStartDate, SellEndDate
FROM AdventureWorks2017.Production.Product
WHERE productID IN (SELECT productID
                    FROM AdventureWorks2017.Production.Product
                        EXCEPT
                    SELECT product_id
                    FROM AdventureWorks_DW.star_schema.d_product);

-- Replace all NULL values with date 31.12.9999
UPDATE StagingDatabase.staging.stage_dim_product_added
SET valid_to='9999-12-31'
WHERE valid_to IS NULL;

-- Load newly added and modified rows into the Data Warehouse
INSERT INTO AdventureWorks_DW.star_schema.d_product
SELECT *
FROM StagingDatabase.staging.stage_dim_product_added;

-- ************************************************************************************************
-- ************************************ DELETED PRODUCTS ************************************
-- ************************************************************************************************

-- Retrieve and update data warehouse, set valid_to attribute to yesterdays date for deleted
-- products.
UPDATE AdventureWorks_DW.star_schema.d_product
SET valid_to = DATEADD(dd, -1, GETDATE())
WHERE product_id in (
    SELECT product_id
    FROM AdventureWorks_DW.star_schema.d_product
    WHERE product_id IN (SELECT product_id
                         FROM AdventureWorks_DW.star_schema.d_product
                             EXCEPT
                         SELECT productID
                         FROM AdventureWorks2017.Production.Product)
)

-- ************************************************************************************************
-- ************************************ UPDATED PRODUCTS ************************************
-- ************************************************************************************************

-- Inserting updated rows into the temporary table to handle changes
INSERT INTO StagingDatabase.staging.stage_dim_product_changed
    (product_id, name, valid_from) (SELECT ProductID, Name, SellStartDate
                                    FROM AdventureWorks2017.Production.Product
                                        EXCEPT
                                    SELECT product_id, name, valid_from
                                    FROM StagingDatabase.staging.stage_dim_product
                                        EXCEPT (
                                             SELECT ProductID, Name, SellStartDate
                                             FROM AdventureWorks2017.Production.Product
                                             WHERE productID IN
                                                   (SELECT productID
                                                    FROM AdventureWorks2017.Production.Product
                                                        EXCEPT
                                                    SELECT product_id
                                                    FROM StagingDatabase.staging.stage_dim_product)
                                         ));

-- Update valid_to attribute to '9999-12-31'
UPDATE StagingDatabase.staging.stage_dim_product_changed
SET valid_to = '9999-12-31'
```

```sql
WHERE valid_to IS NULL;

-- Alter changed rows in Data Warehouse
UPDATE AdventureWorks_DW.star_schema.d_product
SET valid_to = DATEADD(dd, -1, GETDATE())
WHERE product_id in (SELECT product_id FROM StagingDatabase.staging.stage_dim_product_changed);

-- Insert new product to Data Warehouse
INSERT INTO AdventureWorks_DW.star_schema.d_product
SELECT *
FROM StagingDatabase.staging.stage_dim_product_changed;
```

```sql
-- Search and insert newly added customer into staging added Customer table
INSERT INTO StagingDatabase.staging.stage_dim_customer_added(customer_id, title, first_name, middle_name,
last_name)
SELECT CustomerID,Title,FirstName,MiddleName,LastName
FROM AdventureWorks2017.Sales.Customer JOIN AdventureWorks2017.Person.Person ON Customer.PersonID =
Person.BusinessEntityID
WHERE CustomerID IN (SELECT CustomerID
                     FROM AdventureWorks2017.Sales.Customer
                         EXCEPT
                     SELECT customer_id
                     FROM StagingDatabase.staging.stage_dim_customer);

-- Replace all NULL values with current date
UPDATE StagingDatabase.staging.stage_dim_customer_added
SET valid_from = GETDATE()
WHERE valid_to IS NULL;

-- Replace all NULL values with date 31.12.9999
UPDATE StagingDatabase.staging.stage_dim_customer_added
SET valid_to = '9999-12-31'
WHERE valid_to IS NULL;

-- Load newly added and modified rows into the Data Warehouse
INSERT INTO AdventureWorks_DW.star_schema.d_customer
SELECT *
FROM StagingDatabase.staging.stage_dim_customer_added;


-- Retrieve and update data warehouse, set valid_to attribute to yesterdays date for deleted
-- customers.
UPDATE AdventureWorks_DW.star_schema.d_customer
SET valid_to = DATEADD(dd, -1, GETDATE())
WHERE customer_id IN (
    SELECT customer_id
    FROM AdventureWorks_DW.star_schema.d_customer
    WHERE customer_id IN (SELECT customer_id
                          FROM AdventureWorks_DW.star_schema.d_customer
                              EXCEPT
                          SELECT CustomerID
                          FROM AdventureWorks2017.Sales.Customer)
)


-- Inserting updated rows into the temporary table to handle changes
INSERT INTO StagingDatabase.staging.stage_dim_customer_changed
    (customer_id, title, first_name,middle_name,last_name) (SELECT CustomerID,Title, FirstName,
MiddleName, LastName
                                    FROM AdventureWorks2017.Sales.Customer
                                    JOIN AdventureWorks2017.Person.Person ON Customer.PersonID =
Person.BusinessEntityID
                                        EXCEPT
                                    SELECT customer_id, title, first_name,middle_name,last_name
                                    FROM StagingDatabase.staging.stage_dim_customer
                                        EXCEPT (
                                             SELECT CustomerID,Title, FirstName, MiddleName, LastName
                                             FROM AdventureWorks2017.Sales.Customer
                                             JOIN AdventureWorks2017.Person.Person ON Customer.PersonID =
Person.BusinessEntityID
                                             WHERE CustomerID IN
                                                   (SELECT CustomerID
                                                    FROM AdventureWorks2017.Sales.Customer
                                                        EXCEPT
                                                    SELECT customer_id
                                                    FROM StagingDatabase.staging.stage_dim_customer)
                                         ));

-- Update valid_to attribute to '9999-12-31'
```

```sql
UPDATE StagingDatabase.staging.stage_dim_customer_changed
SET valid_from = GETDATE()
WHERE valid_from IS NULL;


-- Update title attribute to 'N/A'
UPDATE StagingDatabase.staging.stage_dim_customer_changed
SET valid_to = '9999-12-31'
WHERE valid_to IS NULL;

-- Update middle_name attribute to 'N/A'
UPDATE StagingDatabase.staging.stage_dim_customer_changed
SET title = 'N/A'
WHERE title IS NULL;

-- Update valid_to attribute to 'N/A'
UPDATE StagingDatabase.staging.stage_dim_customer_changed
SET middle_name = 'N/A'
WHERE middle_name IS NULL;

-- Alter changed rows in Data Warehouse
UPDATE AdventureWorks_DW.star_schema.d_customer
SET valid_to = DATEADD(dd, -1, GETDATE())
WHERE customer_id in (SELECT customer_id FROM StagingDatabase.staging.stage_dim_customer_changed);

-- Insert new customer to Data Warehouse
INSERT INTO AdventureWorks_DW.star_schema.d_customer
SELECT *
FROM StagingDatabase.staging.stage_dim_customer_changed;
```

```sql
-- ************************************************************************************************
-- ********************************** FACT TABLE UPDATE ***********************************
-- ************************************************************************************************

DECLARE @LAST_UPDATE as DATETIME = (SELECT lastUpdate
                                    FROM StagingDatabase.staging.LastUpdate);

-- Insert newly updated rows into temp_f_sales table. Select only the ones newer than the last update.
INSERT INTO StagingDatabase.staging.stage_f_sales
(business_customer_id, business_product_id, business_order_date, quantity, line_total)
    (SELECT C.CustomerID, P.ProductID, OrderDate, SOD.OrderQty, SOD.LineTotal
     FROM AdventureWorks2017.Sales.SalesOrderHeader SOH
              JOIN AdventureWorks2017.Sales.SalesOrderDetail SOD on SOH.SalesOrderID = SOD.SalesOrderID
              JOIN AdventureWorks2017.Sales.Customer C on SOH.CustomerID = C.CustomerID
              JOIN AdventureWorks2017.Production.Product P on SOD.ProductID = P.ProductID
     WHERE OnlineOrderFlag = 1
       AND OrderDate > @LAST_UPDATE);

-- Find corresponding surrogate keys.
-- ***************************** Customer *****************************
UPDATE StagingDatabase.staging.stage_f_sales
SET customer_id = (SELECT dimension_customer_id
                   FROM AdventureWorks_DW.star_schema.d_customer AS dim_C_id
                   WHERE dim_C_id.customer_id = business_customer_id
                     AND valid_to = '9999-12-31')
WHERE customer_id IS NULL;

-- ***************************** Product *****************************
UPDATE StagingDatabase.staging.stage_f_sales
SET product_id = (SELECT dimension_product_id
                  FROM AdventureWorks_DW.star_schema.d_product AS dim_P_id
                  WHERE dim_P_id.product_id = business_product_id
                    AND valid_to = '9999-12-31')
WHERE product_id IS NULL;

-- ***************************** Date *****************************
UPDATE StagingDatabase.staging.stage_f_sales
SET date_id = (SELECT dimension_date_id
               FROM AdventureWorks_DW.star_schema.d_date AS dim_D_id
               WHERE dim_D_id.date = business_order_date)
WHERE date_id IS NULL;

-- Insert data into Data Warehouse Fact Sales table
INSERT INTO AdventureWorks_DW.star_schema.f_sales(customer_id, product_id, date_id, quantity, line_total)
SELECT customer_id, product_id, date_id, quantity, line_total
FROM StagingDatabase.staging.temp_f_sales;

-- Update last update table with the newest date
UPDATE StagingDatabase.staging.LastUpdate
SET lastUpdate = GETDATE()
WHERE lastUpdate = @LAST_UPDATE;
```