

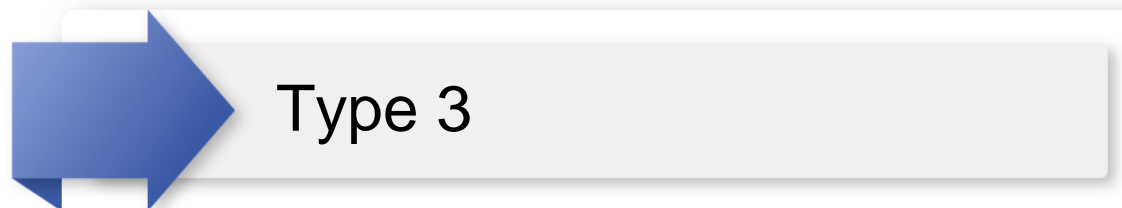
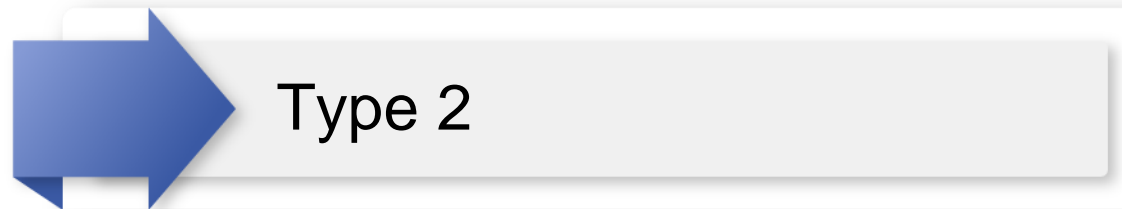
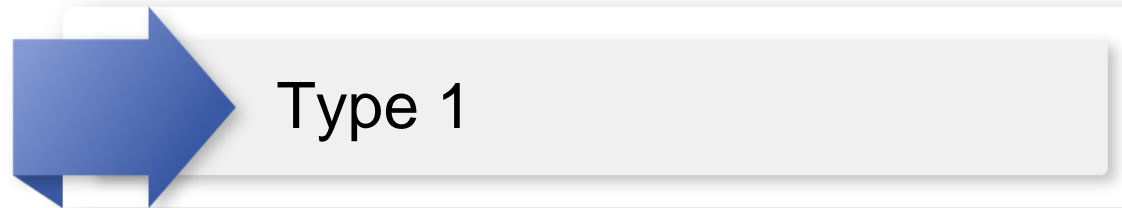
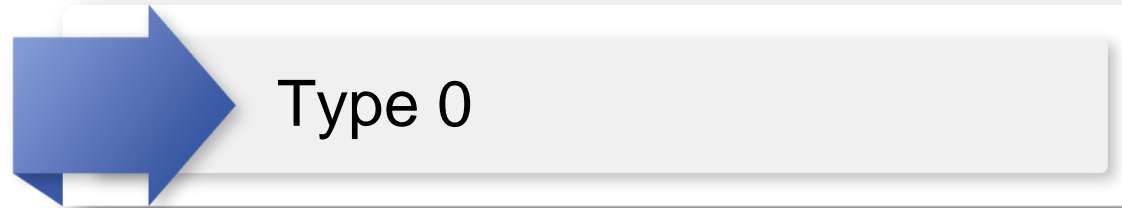
Smarten

**SLOWLY CHANGING DIMENSION
SCENARIOS**

What is Slowly changing Dimension

- A Slowly Changing Dimension (SCD) is a dimension that stores and manages both current and historical data over time in a data warehouse.
- For a Slowly Changing Dimension, data changes slowly over the time, rather than regular or scheduled updates.
- Required for preserving history of relatively static data that by some reason changed based on a time period.

Types of SCD



Type 0 (Fixed Dimension)

- This type takes into consideration that a dimension value will never change once inserted.
- Usually it is considered as default for all dimensions.

Type I (Overwriting)

- We update the record directly. There is no scope of preserving the historical values.
- For eg. Consider a table with Primary key K and a column A with value Y.
- According to the source file, if the unit price is changed from 62.5 to 9 for key product_id = 18, then after running the job for SCD I, the value in the destination is updated to 9 for product_id = 18 without any record for its historical value.

- Eg : Please consider the base table with old and updated values after SCD Type I :

SELECT * FROM PRODUCT_1

100 % <

Results Messages

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED
1	17	Alice Mutton	7	6	20 - 1 kg tins	39	0	0	0	true
2	3	Aniseed Syrup	1	2	12 - 550 ml bottles	10	13	70	25	false
3	40	Boston Crab Meat	19	8	24 - 4 oz tins	18.4	123	0	30	false
4	60	Camembert Pierrot	28	4	15 - 300 g rounds	34	19	0	0	false
5	18	Camarvon Tigers	7	8	16 kg pkg.	62.5	42	0	0	false
6	1	Chai	1	1	10 boxes x 20 bags	18	39	0	10	false
7	1	Chai	1	1	10 boxes x 20 bags	78	39	0	10	false
8	2	Chang	1	1	24 - 12 oz bottles	19	17	40	25	false
9	39	Chartreuse verte	18	1	750 cc per bottle	18	69	0	5	false
10	4	Chef Anton's Cajun Seasoning	2	2	48 - 6 oz jars	22	53	0	0	false

SELECT * FROM PRODUCT_1

100 % <

Results Messages

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED
1	17	Alice Mutton	7	6	20 - 1 kg tins	39	0	0	0	true
2	3	Aniseed Syrup	1	2	12 - 550 ml bottles	10	13	70	25	false
3	40	Boston Crab Meat	19	8	24 - 4 oz tins	18.4	123	0	30	false
4	60	Camembert Pierrot	28	4	15 - 300 g rounds	34	19	0	0	false
5	18	Camarvon Tigers	7	8	16 kg pkg.	9	42	0	0	false
6	1	Chai	1	1	10 boxes x 20 bags	78	39	0	10	false
7	1	Chai	1	1	10 boxes x 20 bags	78	39	0	10	false

Type 2 (Row Versioning)

- When values for a current record change, the current record is marked as closed and a new record gets inserted.
- Usual marking is done by record active/inactive date.
- For eg. Consider a table with key K and a column A with value Y.
- According to the source file, if the unit price is changed from 21 to 45 for product Id = 22, then after running the job for SCD 2, a new record for Rs 45 is inserted with start date, date when it was inserted and end date as null and the older record will have its end date updated to the date when the new record was created.
- P.S. In this type, row versioning allows us to store as many historical values as needed.

- Eg : Please consider the base table with old and updated values after SCD Type 2:

SELECT * FROM PRODUCT_2

100 %

Results Messages

	PRODUCT_ID	PRODUCT_NAME	SUPPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	scd_start	scd_end
1	17	Alice Mutton	7	6	20 - 1 kg tins	39	0	0	0	true	2021-10-05 17:45:06.907	NULL
2	3	Aniseed Syrup	1	2	12 - 550 ml bottles	10	13	70	25	false	2021-10-05 17:45:06.923	NULL
3	40	Boston Crab Meat	19	8	24 - 4 oz tins	18.4	123	0	30	false	2021-10-05 17:45:06.923	NULL
4	60	Camembert Pierrot	28	4	15 - 300 g rounds	34	19	0	0	false	2021-10-05 17:45:06.923	NULL
5	18	Camarvon Tigers	7	8	16 kg pkg.	62.5	42	0	0	false	2021-10-05 17:45:06.923	NULL
6	1	Chai	1	1	10 boxes x 20 bags	18	39	0	10	false	2021-10-05 17:45:06.923	NULL
7	2	Chang	1	1	24 - 12 oz bottles	19	17	40	25	false	2021-10-05 17:45:06.923	NULL
8	39	Chartreuse verte	18	1	750 cc per bottle	18	69	0	5	false	2021-10-05 17:45:06.923	NULL
9	4	Chef Anton's Cajun Seasoning	2	2	48 - 6 oz jars	22	53	0	0	false	2021-10-05 17:45:06.923	NULL
10	5	Chef Anton's Gumbo Mix	2	2	36 boxes	21.35	0	0	0	true	2021-10-05 17:45:06.923	NULL
11	48	Chocolade	22	3	10 pkgs.	12.75	15	70	25	false	2021-10-05 17:45:06.923	NULL
12	38	C��te de Blaye	18	1	12 - 75 cl bottles	263.5	17	0	15	false	2021-10-05 17:45:06.923	NULL
13	58	Escargots de Bourgogne	27	8	24 pieces	13.25	62	0	20	false	2021-10-05 17:45:06.923	NULL
14	52	Filo Mix	24	5	16 - 2 kg boxes	7	38	0	25	false	2021-10-05 17:45:06.923	NULL
15	71	Flotemysost	15	4	10 - 500 g pkgs.	21.5	26	0	0	false	2021-10-05 17:45:06.923	NULL
16	33	Geitost	15	4	500 g	2.5	112	0	20	false	2021-10-05 17:45:06.923	NULL
17	15	Genen Shouyu	6	2	24 - 250 ml bottles	15.5	39	0	5	false	2021-10-05 17:45:06.923	NULL
18	56	Gnocchi di nonna Alice	26	5	24 - 250 g pkgs.	38	21	10	30	false	2021-10-05 17:45:06.923	NULL
19	31	Gorgonzola Telino	14	4	12 - 100 g pkgs	12.5	0	70	20	false	2021-10-05 17:45:06.923	NULL
20	6	Grandma's Boysenberry Spread	3	2	12 - 8 oz jars	25	120	0	25	false	2021-10-05 17:45:06.923	NULL
21	37	Gravad lax	17	8	12 - 500 g pkgs.	26	11	50	25	false	2021-10-05 17:45:06.923	NULL
22	24	Guaran�� Fant��stica	10	1	12 - 355 ml cans	4.5	20	0	0	true	2021-10-05 17:45:06.923	NULL
23	69	Gudbrandsdalsost	15	4	10 kg pkg.	36	26	0	15	false	2021-10-05 17:45:06.923	NULL
24	44	Gula Malacca	20	2	20 - 2 kg bags	19.45	27	0	15	false	2021-10-05 17:45:06.923	NULL
25	26	Gumb��r Gummib��rchen	11	3	100 - 250 g bags	31.23	15	0	0	false	2021-10-05 17:45:06.923	NULL
26	22	Gustaf's Kn��ckebr��d	9	5	24 - 500 g pkgs.	21	104	0	25	false	2021-10-05 17:45:06.923	NULL

SELECT * FROM PRODUCT_2

100 % <

Results Messages

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	scd_start	scd_end
1	22	Gustaf's Kn�ckebr��d	9	5	24 - 500 g pkgs.	21	104	0	25	false	2021-10-05 17:45:06.923	2021-10-19 17:12:56.150
2	22	Gustaf's Kn�ckebr��d	9	5	24 - 500 g pkgs.	45	104	0	25	false	2021-10-19 17:12:56.150	NULL

Type 3 (Previous Value Column)

- The third common SCD type is adding a previous value column. Here, the previous and current versions are maintained in a single row.
- For e.g. Consider a table with key K and a column A with value Y.
- According to the source file, if the unit price is changed from 31 to 56 for product Id = 10, then after running the job for SCD 3, value for column A is changed from Y to X with the previous_UNIT_PRICE column as 31.
- P. S. Only Current and Previous Values of an SCD dimension is saved.

```
SELECT * FROM PRODUCT_3  
WHERE PRODUCT_ID = 10
```

100 %

Results Messages

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	previous_UNIT_PRICE
1	10	lkura	4	8	12 - 200 ml jars	31	31	0	0	false	NULL

```
SELECT * FROM PRODUCT_3  
WHERE PRODUCT_ID = 10
```

100 %

Results Messages

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	previous_UNIT_PRICE
1	10	lkura	4	8	12 - 200 ml jars	56	31	0	0	false	31

```
SELECT * FROM PRODUCT_3  
WHERE PRODUCT_ID = 10
```

100 %

Results Messages

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	previous_UNIT_PRICE
1	10	lkura	4	8	12 - 200 ml jars	87	31	0	0	false	56

Scenarios Explained With Example Snapshots

These examples show how SCD types gives output based on various data types and data value mapping.

SCENARIO I

- *Source data has more than 1 record with same id column.*
- *Table has only one row, but source has more than one rows.*
- *Table and Source data are as shown in the next slide.*

Source Data

A	B	C	D	E	F	G	H	I	J
PRODUCT_ID	PRODUCT_NAME	SUPPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED
1	Chai	1	1	10 boxes x 20 bags	80	39	0	10	false
1	Chai	1	1	10 boxes x 20 bags	67	39	0	10	false

Destination Table – for SCD I

```
SELECT * FROM PRODUCT_1
WHERE PRODUCT_ID = 1
```

PRODUCT_ID	PRODUCT_NAME	SUPPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED
1	Chai	1	1	10 boxes x 20 bags	18	39	0	10	false

After SCD I

```
SELECT * FROM PRODUCT_1
WHERE PRODUCT_ID = 1
```

PRODUCT_ID	PRODUCT_NAME	SUPPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED
1	Chai	1	1	10 boxes x 20 bags	67	39	0	10	false

Here the unit price for Product_ID = 1 is updated from 18 to 67, without keeping any historical data for the same.

Destination Table – for SCD 2

```
SELECT * FROM PRODUCT_2
WHERE PRODUCT_ID = 1
```

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	scd_start	scd_end
1	1	Chai	1	1	10 boxes x 20 bags	18	39	0	10	false	2021-10-19 17:12:56.150	NULL

After SCD 2

```
SELECT * FROM PRODUCT_2
WHERE PRODUCT_ID = 1
```

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	scd_start	scd_end
1	1	Chai	1	1	10 boxes x 20 bags	18	39	0	10	false	2021-10-19 17:12:56.150	2021-10-19 18:20:40.620
2	1	Chai	1	1	10 boxes x 20 bags	67	39	0	10	false	2021-10-19 18:20:40.620	NULL

The unit price for Product ID = 1 has two values now, one which is active and updated, with scd_end as null, and the other is historic data, with start and end date.

Destination Table – for SCD 3

```
SELECT * FROM PRODUCT_3  
WHERE PRODUCT_ID = 1
```

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	previous_UNIT_PRICE
1	1	Chai	1	1	10 boxes x 20 bags	18	39	0	10	false	NULL

After SCD 3

```
SELECT * FROM PRODUCT_3 WHERE PRODUCT_ID = 1
```

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	DATE_COLUMN	previous_UNIT_PRICE
1	1	Chai	1	1	10 boxes x 20 bags	67	39	0	10	false	2021-10-28 18:38:08.447	80

Here, only the Unit Price value is updated twice, from 18 to 80 and then from 80 to 67, so the previous value is 80 and not 18, thus storing only the last updated value.

SCENARIO II

- *NULL value for SCD columns on the sheet to be updated*

- SCD I

BEFORE SCD

```
SELECT * FROM PRODUCT_1 WHERE PRODUCT_ID = '5'
```

PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUE
5	Chef Anton's Gumbo Mix	2	2	36 boxes	21.35	0	0	0	true

AFTER SCD

```
SELECT * FROM PRODUCT_1 WHERE PRODUCT_ID = '5'
```

PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED
5	Chef Anton's Gumbo Mix	2	2	36 boxes	NULL	0	0	0	true

When the sheet we use for updating the table has NULL value for the SCD, then the column in the table is updated to NULL, with older value not being stored as it is type I SCD

- SCD II

BEFORE SCD

```
SELECT * FROM PRODUCT_2 WHERE PRODUCT_ID = '5'
```

PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	DATE_COLUMN	scd_start	scd_end
5	Chef Anton's Gumbo Mix	2	2	36 boxes	21.35	0	0	0	true	2021-10-28	2021-10-28 19:14:34.413	NULL

AFTER SCD

```
SELECT * FROM PRODUCT_2 WHERE PRODUCT_ID = '5'
```

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	DATE_COLUMN	scd_start	scd_end
1	5	Chef Anton's Gumbo Mix	2	2	36 boxes	21.35	0	0	0	true	2021-10-28	2021-10-28 19:14:34.413	2021-11-02 18:02:40.753
2	5	Chef Anton's Gumbo Mix	2	2	36 boxes	NULL	0	0	0	true	2021-10-28	2021-11-02 18:02:40.753	NULL

When the sheet we use for updating the table has NULL value for the SCD, then a new row is inserted with the NULL value for UNIT PRICE and the last record is updated with scd_end indicating it is not active anymore.

- SCD III

BEFORE SCD

```
SELECT * FROM PRODUCT_3 WHERE PRODUCT_ID = '5'
```

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	previous_UNIT_PRICE
1	5	Chef Anton's Gumbo Mix	2	2	36 boxes	21.35	0	0	0	true	NULL

AFTER SCD

```
SELECT * FROM PRODUCT_3 WHERE PRODUCT_ID = '5'
```

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	previous_UNIT_PRICE
	5	Chef Anton's Gumbo Mix	2	2	36 boxes	NULL	0	0	0	true	21.35

When the sheet we use for updating the table has NULL value for the SCD, then the UNIT PRICE is updated as NULL with the Previous unit price being updated with 21.35

SCENARIO III

- *Columns not marked as SCD type in the job – if updated in the update sheet, they get ignored, except for SCD II.*
- *Changed record as follows:*

PRODUCT_ID	PRODUCT_NAME	SUPPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DATE_COLUMN	DISCONTINUED
38	SOME RANDOM NAME	18	1	12 - 75 cl bottles	263.5	17	0	15	28-10-2021	false

```
SELECT * FROM PRODUCT_1 WHERE PRODUCT_ID = '38'

SELECT * FROM PRODUCT_2 WHERE PRODUCT_ID = '38'

SELECT * FROM PRODUCT 3 WHERE PRODUCT ID = '38'
```

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED
1	38	C��te de Blaye	18	1	12 - 75 cl bottles	263.5	17	0	15	false

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	DATE_COLUMN	scd_start	scd_end
1	38	C��te de Blaye	18	1	12 - 75 cl bottles	263.5	17	0	15	false	2021-10-28	2021-10-28 19:08:15.477	2021-10-28 19:14:34.413
2	38	C��te de Blaye	18	1	12 - 75 cl bottles	263.5	17	0	15	false	2021-10-28	2021-10-28 19:14:34.413	2021-11-02 18:02:40.753
3	38	C��te de Blaye	18	1	12 - 75 cl bottles	263.5	17	0	15	false	2021-10-28	2021-11-02 18:02:40.753	2021-11-02 18:21:24.083
4	38	SOME RANDOM NAME	18	1	12 - 75 cl bottles	263.5	17	0	15	false	2021-10-28	2021-11-02 18:21:24.083	NULL

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	previous_UNIT_PRICE
1	38	C��te de Blaye	18	1	12 - 75 cl bottles	263.5	17	0	15	false	NULL

Here, in SCD I and III, the name of the product does not change as it is not marked as a slowly changing dimension, in SCD II since the new record is inserted, the name is also inserted as it is in the sheet which is used for updating

SCENARIO IV

- *Destination has a missing record*

```
SELECT * FROM PRODUCT_1 WHERE PRODUCT_ID = '52'
```

```
SELECT * FROM PRODUCT_2 WHERE PRODUCT_ID = '52'
```

```
SELECT * FROM PRODUCT_3 WHERE PRODUCT_ID = '52'
```

% <

Results Messages

PRODUCT_ID	PRODUCT_NAME	SUPPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED
------------	--------------	---------------	-------------	-------------------	------------	----------------	----------------	---------------	--------------

PRODUCT_ID	PRODUCT_NAME	SUPPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	DATE_COLUMN	scd_start	scd_end
------------	--------------	---------------	-------------	-------------------	------------	----------------	----------------	---------------	--------------	-------------	-----------	---------

PRODUCT_ID	PRODUCT_NAME	SUPPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	previous_UNIT_PRICE
------------	--------------	---------------	-------------	-------------------	------------	----------------	----------------	---------------	--------------	---------------------

- *After SCD*

```
SELECT * FROM PRODUCT_1 WHERE PRODUCT_ID = '52'
```

```
SELECT * FROM PRODUCT_2 WHERE PRODUCT_ID = '52'
```

```
SELECT * FROM PRODUCT_3 WHERE PRODUCT_ID = '52'
```

% <

Results Messages

PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED
52	Filo Mix	24	5	16 - 2 kg boxes	7	38	0	25	Thu Oct 28 18:38:08 IST 2021

PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	DATE_COLUMN	scd_start	scd_end
52	Filo Mix	24	5	16 - 2 kg boxes	7	38	0	25	false	2021-10-28	2021-11-02 18:30:28.003	NULL

PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	previous_UNIT_PRICE
52	Filo Mix	24	5	16 - 2 kg boxes	7	38	0	25	Thu Oct 28 18:38:08 IST 2021	NULL

- *The sheet used for updating the table has a new record which is missing in the Base table (ID = 52), so before SCD, the query shows blank output*
- *After running the job for SCD, in SCD I II and III, a new record is inserted.*
- *In SCD II, a new records inserted with scd_end indicating it is active*
- *In SCD III, a new record inserted with previous value as NULL*

SCENARIO V

- Destination has more than one record*

```
SELECT * FROM PRODUCT_1 WHERE PRODUCT_ID = '17'  
  
SELECT * FROM PRODUCT_2 WHERE PRODUCT_ID = '17'  
  
SELECT * FROM PRODUCT_3 WHERE PRODUCT_ID = '17'
```

100 %

Results Messages

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED
1	17	Alice Mutton	7	6	20 - 1 kg tins	NULL	0	0	0	true
2	17	Alice Mutton	7	6	20 - 1 kg tins	NULL	0	0	0	true

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	DATE_COLUMN	scd_start	scd_end
1	17	Alice Mutton	7	6	20 - 1 kg tins	NULL	0	0	0	true	2021-11-02	2021-11-02 18:34:30.833	NULL
2	17	Alice Mutton	7	6	20 - 1 kg tins	NULL	0	0	0	true	2021-11-02	2021-11-02 18:34:30.833	NULL

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	previous_UNIT_PRICE
1	17	Alice Mutton	7	6	20 - 1 kg tins	NULL	0	0	0	true	67
2	17	Alice Mutton	7	6	20 - 1 kg tins	NULL	0	0	0	true	67

- *After SCD*

```
SELECT * FROM PRODUCT_1 WHERE PRODUCT_ID = '17'

SELECT * FROM PRODUCT_2 WHERE PRODUCT_ID = '17'

SELECT * FROM PRODUCT_3 WHERE PRODUCT_ID = '17'
```

0 % <

Results Messages

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED
1	17	Alice Mutton	7	6	20 - 1 kg tins	56	0	0	0	true
2	17	Alice Mutton	7	6	20 - 1 kg tins	56	0	0	0	true

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	DATE_COLUMN	scd_start	scd_end
1	17	Alice Mutton	7	6	20 - 1 kg tins	NULL	0	0	0	true	2021-11-02	2021-11-02 18:34:30.833	2021-11-02 18:40:17.787
2	17	Alice Mutton	7	6	20 - 1 kg tins	NULL	0	0	0	true	2021-11-02	2021-11-02 18:34:30.833	2021-11-02 18:40:17.787
3	17	Alice Mutton	7	6	20 - 1 kg tins	56	0	0	0	true	2021-10-27	2021-11-02 18:40:17.787	NULL

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	previous_UNIT_PRICE
1	17	Alice Mutton	7	6	20 - 1 kg tins	56	0	0	0	true	NULL
2	17	Alice Mutton	7	6	20 - 1 kg tins	56	0	0	0	true	NULL

- *The base table has more than one record for a particular Product_Id, eg = 17*
- *After running the job for SCD, in SCD I, the value is updated for both the records*
- *In SCD II, the previous records are updated with SCD_end indicating they are inactive and a new record is inserted with the Unit price value*
- *In SCD III, both the records are updated with the Unit price value.*

SCENARIO VI

- Data Type mismatch*

```
SELECT * FROM PRODUCT_1_NEW WHERE PRODUCT_ID IN ('18', '1')
```

```
SELECT * FROM PRODUCT_2_NEW WHERE PRODUCT_ID IN ('18', '1')
```

```
SELECT * FROM PRODUCT_3_NEW WHERE PRODUCT_ID IN ('18', '1')
```

0 % <

Results Messages

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	DATE_COLUMN
1	18	Camaron Tigers	7	8	16 kg pkg.	62.5	42	0	0	false	2021-11-02
2	1	Chai	1	1	10 boxes x 20 bags	18	39	0	10	false	2021-11-02

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	DATE_COLUMN	scd_start	scd_end
1	18	Camaron Tigers	7	8	16 kg pkg.	62.5	42	0	0	false	2021-11-02 18:49:22.270	2021-11-02 18:49:22.270	NULL
2	1	Chai	1	1	10 boxes x 20 bags	18	39	0	10	false	2021-11-02 18:49:22.270	2021-11-02 18:49:22.270	NULL

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	DATE_COLUMN	previous_UNIT_PRICE
1	18	Camaron Tigers	7	8	16 kg pkg.	62.5	42	0	0	false	2021-11-02 18:51:06.380	NULL
2	1	Chai	1	1	10 boxes x 20 bags	18	39	0	10	false	2021-11-02 18:51:06.380	NULL

	A	B	C	D	E	F	G	H	I	J	K	L
1	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDE	REORDER_LEVEL	DATE_COLUMN	DISCONTINUE	
5	18	Carnarvon Tigers	7	8	16 kg pkg.	62.5	42	0	0	"10/28/2021 6:38:08 PM"	false	
6	1	Chai	1	1	10 boxes x 20 bags	18	39	0	10	28-10-2021	false	
78												
79												
80												

Since these values will be ignored by the Talend job, no value is updated in the destination in all SCDs, i.e. type I, II and III

```
SELECT * FROM PRODUCT_1_NEW WHERE PRODUCT_ID IN ('18', '1')
```

```
SELECT * FROM PRODUCT_2_NEW WHERE PRODUCT_ID IN ('18', '1')
```

```
SELECT * FROM PRODUCT_3_NEW WHERE PRODUCT_ID IN ('18', '1')
```

0 %

Results Messages

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	DATE_COLUMN
1	18	Camarvon Tigers	7	8	16 kg pkg.	62.5	42	0	0	false	2021-11-02
2	1	Chai	1	1	10 boxes x 20 bags	18	39	0	10	false	2021-11-02

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	DATE_COLUMN	scd_start	scd_end
1	18	Camarvon Tigers	7	8	16 kg pkg.	62.5	42	0	0	false	2021-11-02 18:49:22.270	2021-11-02 18:49:22.270	NULL
2	1	Chai	1	1	10 boxes x 20 bags	18	39	0	10	false	2021-11-02 18:49:22.270	2021-11-02 18:49:22.270	NULL

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	DATE_COLUMN	previous_UNIT_PRICE
1	18	Camarvon Tigers	7	8	16 kg pkg.	62.5	42	0	0	false	2021-11-02 18:51:06.380	NULL
2	1	Chai	1	1	10 boxes x 20 bags	18	39	0	10	false	2021-11-02 18:51:06.380	NULL

THANK YOU!

Slowly Changing Dimension Scenarios