

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 * F	ROM PRODUCT_1								
	100 %	- <									
- ľ	E F	Results 🛅 Mess	ages								
		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
卜	5	18	Camarvon Tigers	7	8	16 kg pkg.	62.5	42	0	0	false
1	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								
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	Results 🛅 Mess	sages								
	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUE
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:

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

SELECT * FROM PRODUCT_2

	SELECT * FROM PRODUCT_2												
10	100 % - <												
	Re	esults 🔒 Mess	ages										
		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 KnĤckebrĶd	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	2	22	Gustaf's KnĤckebrĶd	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.

		FROM PRODUCT									
00 9		DUCT ID = I0									
	Results Mes	sages									
	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	Ikura	4	8	12 - 200 ml jars	31	31	0	0	false	NULL
	9				_						
E	 ∋SELECT *	FROM PRODUCT	3								
	WHERE PRO	DUCT $ID = 10$									
0 %	6 - <	~~~~~									
	Results 📑 Mes	sages									
							UNITS IN STOCK	UNITS ON ORDER	REORDER LEVEL	DISCONTINUED	previous LINIT PRICE
	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	ontro_int_oroon		Inconden_cevee		previous_ontr_rnice
1	PRODUCT_ID 10	PRODUCT_NAME	SUPLEMENT_ID 4	CATEGORY_ID 8	QUANTITY_PER_UNIT 12 - 200 ml jars	56	31	0	0	false	31
1	PRODUCT_ID 10	PRODUCT_NAME Ikura	SUPLEMENT_ID	CATEGORY_ID 8	QUANTITY_PER_UNIT 12 - 200 ml jars	56	31	0	0	false	31
1	PRODUCT_ID 10	PRODUCT_NAME Ikura	SUPLEMENT_ID 4	CATEGORY_ID 8	QUANTITY_PER_UNIT 12 - 200 ml jars	56	31	0	0	false	31
 	PRODUCT_ID 10	PRODUCT_NAME	SUPLEMENT_ID 4	CATEGORY_ID 8	QUANTITY_PER_UNIT	56	31	0	0	false	31
1	PRODUCT_ID 10 SELECT *	PRODUCT_NAME kura	SUPLEMENT_ID	8	QUANTITY_PER_UNIT	56	31	0	0	false	31
1	PRODUCT_ID 10 SELECT * WHERE PRO	PRODUCT_NAME kura FROM PRODUCT DUCT_ID = 10	SUPLEMENT_ID	8	QUANTITY_PER_UNIT	56	31	0	0	false	31
1 00 %	PRODUCT_ID 10 SELECT * WHERE PRO 6 • < Results B Mes	PRODUCT_NAME kura FROM PRODUCT DUCT_ID = 10	SUPLEMENT_ID 4	8	QUANTITY_PER_UNIT 12 - 200 ml jars	56	31	0	0	false	31
1	PRODUCT_ID 10 SELECT * WHERE PRO 6 C	PRODUCT_NAME kura FROM PRODUCT DUCT_ID = 10 sages PRODUCT_NAME	SUPLEMENT_ID 4 3 SUPLEMENT_ID	CATEGORY_ID 8 CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	31 UNITS_IN_STOCK	0 UNITS_ON_ORDER	0 REORDER_LEVEL	false	previous_UNIT_PRICE
1 00 %	PRODUCT_ID 10 SELECT * WHERE PRO 6 - < Results B Mes PRODUCT_ID 10	PRODUCT_NAME kura FROM PRODUCT DUCT_ID = 10 sages PRODUCT_NAME kura	SUPLEMENT_ID 4 SUPLEMENT_ID 4	CATEGORY_ID 8 CATEGORY_ID 8	QUANTITY_PER_UNIT 12 - 200 ml jars QUANTITY_PER_UNIT 12 - 200 ml jars	UNIT_PRICE VUNIT_PRICE 87	31 UNITS_IN_STOCK 31	0 UNITS_ON_ORDER 0	0 REORDER_LEVEL 0	false DISCONTINUED false	previous_UNIT_PRICE 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 I 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

А	В	С	D	E	F	G	Н	l.	J
PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_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 = 1100 % - - - < Results Messages PRODUCT_NAME SUPLEMENT_ID CATEGORY_ID QUANTITY_PER_UNIT UNIT_PRICE UNITS_IN_STOCK UNITS_ON_ORDER PRODUCT_ID REORDER_LEVEL DISCONTINUED 10 boxes x 20 bags Chai 1 1 18 39 0 10 false 1 After SCD I SELECT * FROM PRODUCT 1 WHERE PRODUCT ID = 1100 % 👻 < Messages Results PRODUCT_ID PRODUCT_NAME SUPLEMENT_ID CATEGORY_ID QUANTITY_PER_UNIT UNIT_PRICE UNITS_IN_STOCK UNITS_ON_ORDER DISCONTINUED REORDER_LEVEL Chai 10 boxes x 20 bags 67 39 0 10 false 1 1

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

Destination Table – for SCD 2

	ESELECT * FROM PRODUCT_2													
	WHERE PRODUCT ID = 1													
100	% - <													
	III Results dessages													
	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

ESELECT * FROM PRODUCT 2 WHERE PRODUCT ID = 1													
100 % - <													
	Results Assages												
	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												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 = I 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	SELECT * FROM PRODUCT_3												
WHERE F	WHERE PRODUCT ID = 1												
100 % 👻 <													
🛅 Results 📑	🔢 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 1	Chai	1	1	10 boxes x 20 bags	18	39	0	10	false	NULL			
				-									

After SCD 3

1	SELECT * FF	ROM PRODUCT_3	3 WHERE PRODUCT_I	D = 1								
100 9	% ▼ <											
	Results 📑 Messag	jes										
	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 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'

→ <										
Results 📑	Messa	ages								
PRODUCT	LID	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 * F	SELECT * FROM PRODUCT_1 WHERE PRODUCT_ID = '5'													
∕₀ ▼ <	 ✓ 													
Results 🛅 Mess	Results Messages													
PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED					
5	5 Chef Anton's Gumbo Mix 2 2 36 boxes NULL 0 0 0 true													
					\bigcirc									

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 *	SELECT * FROM PRODUCT_2 WHERE PRODUCT_ID = '5'												
6 - <	• <												
Results 🛅 Mess	sages												
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

	ESELECT * FROM PRODUCT_2 WHERE PRODUCT_ID = '5'												
100	%												
	Results 🚹 Mess	ages											
	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 PRODU	JCT_ID = '5	•									
0% - <													
🛾 Results 📑 Mes	Results 📑 Messages												
PRODUCT_ID	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	21.35	0	0	0	true	NULL			
AF SELECT * F	TER SCC) WHERE PRODUC	CT_ID = '5'										
Results B Messa	10es												
PRODUCT_ID	esuits a 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												
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	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT 🔽	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDE	REORDER_LEVEL	DATE_COLUM	
38 SOME RANDOM NAME	18	1	12 - 75 cl bottles	263.5	17	0	15	28-10-2021	false

	SELECT * I	FROM PRODUCT_1	WHERE PROD	UCT_ID = '	8'								
	SELECT * I	FROM PRODUCT_2	WHERE PROD	UCT_ID = '	8'								
6	SELECT * I	FROM PRODUCT 3	WHERE PROD	UCT ID = 'E	8'								
Re	esults 🛅 Mess	sages											
Т	PRODUCT_ID	PRODUCT_NAME S	UPLEMENT_ID C	ATEGORY_ID Q	UANTITY_PER_UNIT	JNIT_PRICE U	NITS_IN_STOCK U	INITS_ON_ORDER F	EORDER_LEVEL	DISCONTINUED			
1	38	CÃte de Blaye	18 1	1 1	2 - 75 cl bottles	263.5 1	7 0) 1	5	false			
	PRODUCT ID	PRODUCT NAME	SUPLEMENT ID	CATEGORY ID	QUANTITY PER UNI		UNITS IN STOCK	UNITS ON ORDER	REORDER LEVE		DATE COLUMN	scd start	scd end
	PRODUCT_ID 38	PRODUCT_NAME CĂte de Blaye	SUPLEMENT_IC	CATEGORY_ID	QUANTITY_PER_UNI 12 - 75 cl bottles	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVE	L DISCONTINUED	DATE_COLUMN 2021-10-28	scd_start 2021-10-28 19:08:15.477	scd_end 2021-10-28 19:14:34.413
	PRODUCT_ID 38 38	PRODUCT_NAME CĂte de Blaye CĂte de Blaye	SUPLEMENT_IC 18 18	CATEGORY_ID	QUANTITY_PER_UNI 12 - 75 cl bottles 12 - 75 cl bottles	UNIT_PRICE 263.5 263.5	UNITS_IN_STOCK 17 17	UNITS_ON_ORDER 0 0	REORDER_LEVE	L DISCONTINUED false false	DATE_COLUMN 2021-10-28 2021-10-28	scd_start 2021-10-28 19:08:15.477 2021-10-28 19:14:34.413	scd_end 2021-10-28 19:14:34.413 2021-11-02 18:02:40.753
	PRODUCT_ID 38 38 38	PRODUCT_NAME CĂte de Blaye CĂte de Blaye CĂte de Blaye	SUPLEMENT_ID 18 18 18	CATEGORY_ID 1 1 1	QUANTITY_PER_UNI 12 - 75 cl bottles 12 - 75 cl bottles 12 - 75 cl bottles 12 - 75 cl bottles	UNIT_PRICE 263.5 263.5 263.5 263.5	UNITS_IN_STOCK 17 17 17 17	UNITS_ON_ORDER 0 0 0	REORDER_LEVE 15 15 15	L DISCONTINUED false false false	DATE_COLUMN 2021-10-28 2021-10-28 2021-10-28	scd_start 2021-10-28 19:08:15.477 2021-10-28 19:14:34.413 2021-11-02 18:02:40.753	scd_end 2021-10-28 19:14:34.413 2021-11-02 18:02:40.753 2021-11-02 18:21:24.083
Ĩ	PRODUCT_ID 38 38 38 38 38	PRODUCT_NAME CĂte de Blaye CĂte de Blaye CĂte de Blaye SOME RANDOM NAM	SUPLEMENT_IC 18 18 18 18 E 18	CATEGORY_ID 1 1 1 1 1 1	QUANTITY_PER_UNIT 12 - 75 cl bottles 12 - 75 cl bottles 12 - 75 cl bottles 12 - 75 cl bottles 12 - 75 cl bottles	UNIT_PRICE 263.5 263.5 263.5 263.5 263.5	UNITS_IN_STOCK 17 17 17 17 17 17	UNITS_ON_ORDER 0 0 0 0 0	REORDER_LEVE 15 15 15 15 15	L DISCONTINUED false false false false false	DATE_COLUMN 2021-10-28 2021-10-28 2021-10-28 2021-10-28 2021-10-28	scd_start 2021-10-28 19:08:15.477 2021-10-28 19:14:34.413 2021-11-02 18:02:40.753 2021-11-02 18:21:24.083	scd_end 2021-10-28 19:14:34.413 2021-11-02 18:02:40.753 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	CÃte 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 SUPLEMENT_ID CATEGORY_ID QUANTITY_PER_UNIT UNIT_PRICE UNITS_IN_STOCK UNITS_ON_ORDER REORDER_LEVEL DISCONTINUED

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

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

• After SCD

SELECT *	FROM	PRODUCT	1 WHERE	PRODUCT	ID =	'52

SELECT *	FROM	PRODUCT	2	WHERE	PRODUCT	ID	=	'52'

SELECT * FR	ROM PRODUCT	3 WHERE	PRODUCT	ID =	'52'
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%	-	<	
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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, an new record is inserted.
- In SCD II, anew 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 * F	ROM PRODUCT_	_2 WHERE PRO	DUCT_ID =	'17'								
	SELECT * FROM PRODUCT_3 WHERE PRODUCT_ID = '17'												
0 9	6 - <												
	Results 🛅 Mess	ages											
	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			
>	17	Alice Mutton	7	6	20 - 1 ka 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'

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🗄 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
	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
}	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
	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')

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F	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			
	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
I	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

	А	В	C D	E	F	G	Н	I	L	К	L
1	PRODUCT_ID 🛛	PRODUCT_NAME	SUPLEMENT_ID 🔽 CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE 💌	UNITS_IN_STOCK	UNITS_ON_ORDE	REORDER_LEVEL 💌 I	DATE_COLUMN		
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									$\langle $		
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

	PRODUCT_ID	PRODUCT_NAME	SUPLEMENT_ID	CATEGORY_ID	QUANTITY_PER_UNIT	UNIT_PRICE	UNITS_IN_STOCK	UNITS_ON_ORDER	REORDER_LEVEL	DISCONTINUED	DATE_COLUMN
	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
l –	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

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