

# U2M7.LW.Materialized Views

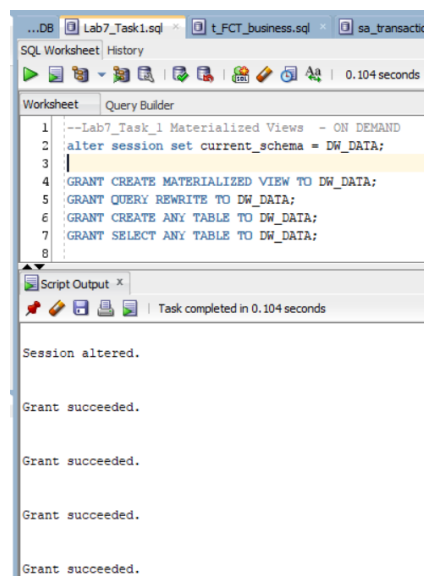
Shkrabatouskaya Vera

[https://github.com/VeraShkrabatouskaya/DataMola\\_Data-Camping-2022](https://github.com/VeraShkrabatouskaya/DataMola_Data-Camping-2022)

## 2. Materialized Views- Basic

### 2.1. Task 01: Create Materialized Views - ON DEMAND

Grant rights to user DW\_DATA to create a materialized view.



```
--Lab7_Task_1 Materialized Views - ON DEMAND
alter session set current_schema = DW_DATA;

GRANT CREATE MATERIALIZED VIEW TO DW_DATA;
GRANT QUERY REWRITE TO DW_DATA;
GRANT CREATE ANY TABLE TO DW_DATA;
GRANT SELECT ANY TABLE TO DW_DATA;
```

Script Output x

Task completed in 0.104 seconds

Session altered.

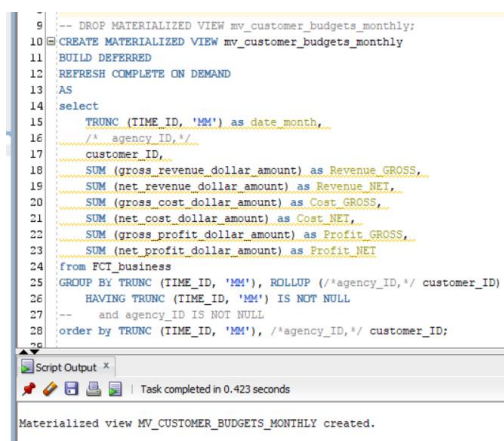
Grant succeeded.

Grant succeeded.

Grant succeeded.

Grant succeeded.

Let's create Materialized View, which will refresh ON DEMAND.



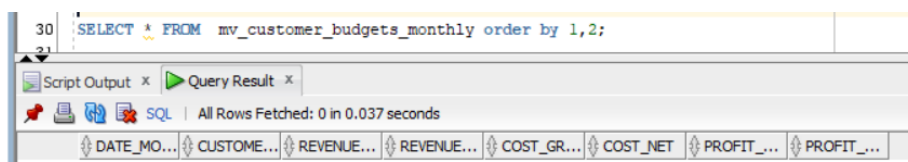
```
-- DROP MATERIALIZED VIEW mv_customer_budgets_monthly;
CREATE MATERIALIZED VIEW mv_customer_budgets_monthly
BUILD DEFERRED
REFRESH COMPLETE ON DEMAND
AS
select
  TRUNC (TIME_ID, 'MM') as date_month,
  /* agency_ID, */
  customer_ID,
  SUM (gross_revenue.dollar_amount) as Revenue_GROSS,
  SUM (net_revenue.dollar_amount) as Revenue_NET,
  SUM (gross_cost.dollar_amount) as Cost_GROSS,
  SUM (net_cost.dollar_amount) as Cost_NET,
  SUM (gross_profit.dollar_amount) as Profit_GROSS,
  SUM (net_profit.dollar_amount) as Profit_NET
from FCT_business
GROUP BY TRUNC (TIME_ID, 'MM'), ROLLUP (/*agency_ID,*/ customer_ID)
HAVING TRUNC (TIME_ID, 'MM') IS NOT NULL
-- and agency_ID IS NOT NULL
order by TRUNC (TIME_ID, 'MM'), /*agency_ID,*/ customer_ID;
```

Script Output x

Task completed in 0.423 seconds

Materialized view MV\_CUSTOMER\_BUDGETS\_MONTHLY created.

As we can see, the materialized view remains empty after creation.



```
30 SELECT * FROM mv_customer_budgets_monthly order by 1,2;
```

Script Output x Query Result x

SQL | All Rows Fetched: 0 in 0.037 seconds

DATE_MO...	CUSTOME...	REVENUE...	REVENUE...	COST_GR...	COST_NET	PROFIT_...	PROFIT_...
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Let's execute the materialized view using the function DBMS\_MVIEW.REFRESH.

```

31 |
32 | EXECUTE DBMS_MVIEW.REFRESH('mv_customer_budgets_monthly');
33 |

```

Script Output x Query Result x

Task completed in 0.864 seconds

Materialized view MV\_CUSTOMER\_BUDGETS\_MONTHLY created.

PL/SQL procedure successfully completed.

We received data on monthly revenues, costs and profits by customers of the international advertising agency Starcom.

34 | SELECT \* FROM mv\_customer\_budgets\_monthly order by 1,2;

Script Output x Query Result x

SQL | All Rows Fetched: 21 in 0.042 seconds

DATE_MONTH	CUSTOMER_ID	REVENUE_GROSS	REVENUE_NET	COST_GROSS	COST_NET	PROFIT_GROSS	PROFIT_NET
01-JAN-22	1	52553577.26	44735597.04	12551028.06	10710691	40002549.97	34024902.32
01-JAN-22	2	17493193.41	14093055.68	4109317.67	3575764	13303076.1	11317290.47
01-JAN-22	(null)	70046770.67	59628652.72	16740345.73	14286455	53306426.07	45342192.79
01-FEB-22	1	47354477.71	40308001.53	11351171.22	9686893	36003307.43	30621105.23
01-FEB-22	2	15750257.33	13412401.91	3788668.37	3232524	11961589.13	10179876.96
01-FEB-22	(null)	63104735.04	53720403.44	15139839.59	12919417	47964896.56	40800982.19
01-MAR-22	1	52381394.49	44591213.24	12595838.74	10750046	39785556.88	33841163.77
01-MAR-22	2	17560662.94	14950319.3	4187048.81	3574006	13373614.58	11376312.22
01-MAR-22	(null)	69942057.43	59541532.54	16782887.55	14324052	53159171.46	45217475.99
01-APR-22	1	50823746.84	43255935.83	12153592.29	10371890	38670155.48	32884042.23
01-APR-22	2	16876287.41	14364107.76	4043916.65	3452023	12832370.78	10912083.86
01-APR-22	(null)	67700034.25	57620043.59	16197508.94	13823913	51502526.26	43796126.09
01-MAY-22	1	52610648.47	44784133.06	12582709.79	10741822	40027939.9	34042307.18
01-MAY-22	2	17429900.83	14838126.99	4185818.58	3571925	13244082.89	11266200.56
01-MAY-22	(null)	70040549.3	59622260.05	16768528.37	14313747	53272022.79	45308507.74
01-JUN-22	1	50351376.75	42847020.17	12154107.12	10372464	38197270.51	32474552.83
01-JUN-22	2	16315132.7	13889314.63	4070711.04	3475099	12244421.93	10414214.34
01-JUN-22	(null)	66666509.45	56736334.8	16224818.16	13847563	50441692.44	42888767.17
01-JUL-22	1	32531775.38	27686999.85	7748204.86	6613151	24783571.1	21073846.88
01-JUL-22	2	10644817.09	9063042.04	2591990.45	2212859	8052827.09	6850182.25
01-JUL-22	(null)	43176592.47	36750041.89	10340195.31	8826010	32836398.19	27924029.13

Let's received data on monthly revenues, costs and profits by agencies and customers of the international advertising agency Starcom.

```

36 | --DROP MATERIALIZED VIEW mv_agency_customer_budgets_monthly;
37 | CREATE MATERIALIZED VIEW mv_agency_customer_budgets_monthly
38 | BUILD DEFERRED
39 | REFRESH COMPLETE ON DEMAND
40 | AS
41 | select
42 |     TRUNC (TIME_ID, 'MM') as date_month,
43 |     agency_ID,
44 |     customer_ID,
45 |     SUM (gross_revenue_dollar_amount) as Revenue_GROSS,
46 |     SUM (net_revenue_dollar_amount) as Revenue_NET,
47 |     SUM (gross_cost_dollar_amount) as Cost_GROSS,
48 |     SUM (net_cost_dollar_amount) as Cost_NET,
49 |     SUM (gross_profit_dollar_amount) as Profit_GROSS,
50 |     SUM (net_profit_dollar_amount) as Profit_NET
51 | from FCT_business
52 | GROUP BY TRUNC (TIME_ID, 'MM'), ROLLUP (agency_ID, customer_ID)
53 | HAVING TRUNC (TIME_ID, 'MM') IS NOT NULL
54 | and agency_ID IS NOT NULL
55 | order by TRUNC (TIME_ID, 'MM'), agency_ID, customer_ID;
56 |

```

Script Output x

Task completed in 0.096 seconds

Materialized view MV\_AGENCY\_CUSTOMER\_BUDGETS\_MONTHLY created.

57 | SELECT \* FROM mv\_agency\_customer\_budgets\_monthly order by 1,2,3;

Script Output x Query Result x

SQL | All Rows Fetched: 0 in 0.071 seconds

DATE_MO...	AGENCY_ID	CUSTOME...	REVENUE...	REVENUE...	COST_GR...	COST_NET	PROFIT_...	PROFIT_...
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59 EXECUTE DBMS\_MVIEW.REFRESH('mv\_agency\_customer\_budgets\_monthly');

Script Output x Query Result x

Task completed in 0.221 seconds

Materialized view MV\_AGENCY\_CUSTOMER\_BUDGETS\_MONTHLY created.

PL/SQL procedure successfully completed.

61 SELECT \* FROM mv\_agency\_customer\_budgets\_monthly order by 1,2,3;

Script Output x Query Result x

SQL Fetched 50 rows in 0.008 seconds

	DATE_MONTH	AGENCY_ID	CUSTOMER_ID	REVENUE_GROSS	REVENUE_NET	COST_GROSS	COST_NET	PROFIT_GROSS	PROFIT_NET
1	01-JAN-22	1	1	2050863.84	1814924.36	453177.46	401042	1597686.38	1413882.14
2	01-JAN-22	1	2	645456.39	571200.61	160218.18	141786	485238.21	429414.48
3	01-JAN-22	1	(null)	2696320.23	2386124.97	613395.64	542828	2082924.59	1843296.62
4	01-JAN-22	2	1	340225.96	285904.31	124926.2	104980	215299.76	180924.26
5	01-JAN-22	2	2	120367.92	101149.5	36621.06	30774	83746.86	70375.5
6	01-JAN-22	2	(null)	460593.88	387053.81	161547.26	135754	299046.62	251299.76
7	01-JAN-22	3	1	1221500.01	1026470.81	488793.69	410751	732706.31	615719.68
8	01-JAN-22	3	2	419905.83	352861.96	170392.53	143187	249513.3	209674.93
9	01-JAN-22	3	(null)	1641405.84	1379332.77	659186.22	553938	982219.61	825394.61
10	01-JAN-22	4	1	1484386.69	1413701.55	438782.4	417888	1045604.28	995813.55
11	01-JAN-22	4	2	534248.55	508808.23	137796.75	131235	396451.8	377573.23
12	01-JAN-22	4	(null)	2018635.24	1922509.78	576579.15	549123	1442056.08	1373386.78
13	01-JAN-22	5	1	742853.32	624330.62	115707.27	97233	627246.05	527097.61
14	01-JAN-22	5	2	253158.5	212738.27	40794.39	34281	212364.11	178457.26
15	01-JAN-22	5	(null)	996111.82	837068.89	156501.66	131514	839610.16	705554.87
16	01-JAN-22	6	1	212220.3	173951.04	123272.46	101043	88947.84	72908.01
17	01-JAN-22	6	2	69599.2	57048.5	37707.76	30908	31891.44	26140.5
18	01-JAN-22	6	(null)	281819.5	230999.54	160980.22	131951	120839.28	99048.51
19	01-JAN-22	7	1	550434.78	478639.12	118869.75	103365	431565.01	375274.08
20	01-JAN-22	7	2	179082.14	155723.6	40078.65	34851	139003.48	120872.59
21	01-JAN-22	7	(null)	729516.92	634362.72	158948.4	138216	570569.49	496146.67
22	01-JAN-22	8	1	217448.59	181207.14	123079.2	102566	94369.39	78641.13
23	01-JAN-22	8	2	76508.12	63756.72	37207.2	31006	39300.92	32750.7
24	01-JAN-22	8	(null)	293956.71	244963.86	160286.4	133572	133670.31	111391.83
25	01-JAN-22	9	1	895215.16	727817.32	126806.85	103095	768408.31	624722.32

## 2.2. Task 02: Create Materialized Views - ON COMMIT

Grant rights to user DW\_DATA to create a materialized view.

...aDB Lab7\_Task2\_Materialized Views - ON COMMIT.sql

SQL Worksheet History

Worksheet Query Builder

```

1 --Lab7_Task2_Materialized Views - ON COMMIT
2 alter session set current_schema = DW_DATA;
3 GRANT ON COMMIT REFRESH to DW_DATA;
4

```

Script Output x

Task completed in 0.049 seconds

Session altered.

Grant succeeded.

CREATE MATERIALIZED VIEW LOG ON DW\_DATA.FCT\_business INCLUDING NEW VALUES.

```

5 CREATE MATERIALIZED VIEW LOG ON DW_DATA.FCT_business
6 WITH rowid, SEQUENCE(
7   Business_Fact_ID,
8   TIME_ID,
9   customer_ID,
10  employee_ID,
11  agency_ID,
12  gen_period_ID,
13  product_ID,
14  promotion_ID,
15  gross_profit_dollar_amount,
16  net_profit_dollar_amount,
17  gross_revenue_dollar_amount,
18  net_revenue_dollar_amount,
19  gross_cost_dollar_amount,
20  net_cost_dollar_amount,
21  gross_salary_employee_dollar_amount,
22  net_salary_employee_dollar_amount,
23  gross_profit_margin_percent
24 )
25 INCLUDING NEW VALUES;
26

```

Script Output x

Task completed in 0.169 seconds

Grant succeeded.

Materialized view log DW\_DATA.FCT\_BUSINESS created.

CREATE MATERIALIZED VIEW for the daily report.

```
29 CREATE MATERIALIZED VIEW mv_product_daily
30 BUILD IMMEDIATE
31 REFRESH FAST ON COMMIT
32 ENABLE QUERY REWRITE
33 AS
34 select
35     TIME_ID,
36     product_id,
37     SUM (gross_revenue_dollar_amount) as Revenue_GROSS,
38     SUM (net_revenue_dollar_amount) as Revenue_NET,
39     SUM (gross_cost_dollar_amount) as Cost_GROSS,
40     SUM (net_cost_dollar_amount) as Cost_NET,
41     SUM (gross_profit_dollar_amount) as Profit_GROSS,
42     SUM (net_profit_dollar_amount) as Profit_NET
43 from DW_DATA.FCT_business
44 GROUP BY (TIME_ID, product_id)
45 order by TIME_ID, product_id;
46
```

Script Output x | Task completed in 0.458 seconds

Materialized view MV\_PRODUCT\_DAILY created.

We can see the data after creating the materialize view - on commit.

47 SELECT \* FROM mv\_product\_daily ORDER BY 1,2;

Query Result x | Fetched 150 rows in 0.033 seconds

TIME_ID	PRODUCT_ID	REVENUE_GROSS	REVENUE_NET	COST_GROSS	COST_NET	PROFIT_GROSS	PROFIT_NET
01-JAN-22	1	139558.89	118705.48	35318.84	30158	104240.04	88547.48
01-JAN-22	2	163231.78	138857.09	36416.81	30976	126814.97	107881.09
01-JAN-22	3	147411.51	125662.99	32798.66	28049	114612.86	97613.99
01-JAN-22	4	124716.14	105979.96	33180.02	28289	91536.16	77690.96
01-JAN-22	5	121792.83	104523.59	33628.75	28713	88164.12	75810.57
01-JAN-22	6	131090.64	111412.23	35126.01	29992	95964.61	81420.22
01-JAN-22	7	159074.68	135689.06	35133.75	29992	123940.94	105697.05
01-JAN-22	8	127286.38	108191.87	33990.25	29055	93296.16	79136.84
01-JAN-22	9	138952.94	118377.3	35014.27	29968	103938.69	88409.29
01-JAN-22	10	134169.68	113864.36	34122.87	29076	100046.78	84788.36
01-JAN-22	11	142378.69	120992.5	33738.78	28722	108639.91	92270.5
01-JAN-22	12	137895.03	117421.63	31972.75	27391	105922.31	90030.61
01-JAN-22	13	153849.68	130970.1	31269.84	26744	122579.85	104226.09
01-JAN-22	14	142246.63	121032.23	38295.34	32649	103951.3	88383.21
01-JAN-22	15	130925.2	111174.39	35957.06	30597	94968.14	80577.36
01-JAN-22	16	131155.22	112112.17	33085.82	28314	98069.42	83798.14
01-JAN-22	1	141000.01	120911.96	33789.53	28958	107210.46	91953.96
02-JAN-22	2	143903.02	122791.9	34597.44	29491	109305.59	93300.89
02-JAN-22	3	131452.02	112250.88	33912.89	28982	97539.13	83268.87
02-JAN-22	4	145311.45	124077.71	36022.37	30817	109289.11	93260.7
02-JAN-22	5	150572.42	128156.7	32565.22	27889	118007.21	100267.7
02-JAN-22	6	154097.24	131107.81	33156.6	28273	120940.65	102834.81
02-JAN-22	7	149587.28	127029.54	33285.64	28400	116301.64	98629.54
02-JAN-22	8	133166.65	113833.5	30486.75	26004	102679.88	87829.49

Let's delete all promotions before 15/01/2022.

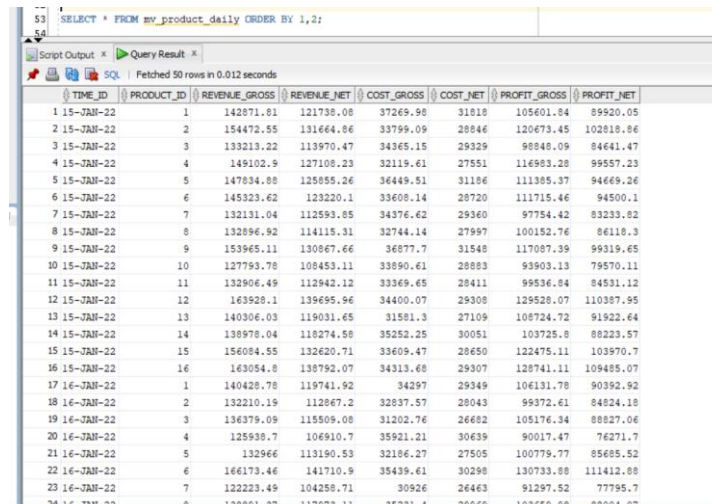
```
49 DELETE FROM DW_DATA.FCT_business
50 WHERE TIME_ID < to_date('15/01/2022', 'dd/mm/yyyy');
51 COMMIT;
```

Script Output x | Query Result x | Task completed in 3.355 seconds

23,520 rows deleted.

Commit complete.

As we can see, the data was updated immediately.

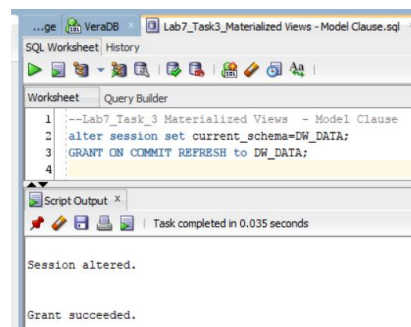


TIME_ID	PRODUCT_ID	REVENUE_GROSS	REVENUE_NET	COST_GROSS	COST_NET	PROFIT_GROSS	PROFIT_NET
1 15-JAN-22	1	142871.81	121738.08	37269.98	31818	105601.84	89920.05
2 15-JAN-22	2	154472.55	131664.86	33799.09	28846	120673.45	102818.86
3 15-JAN-22	3	133213.22	113970.47	34365.15	29329	98848.09	84641.47
4 15-JAN-22	4	149102.9	127108.23	32119.61	27551	116983.28	99557.23
5 15-JAN-22	5	147834.88	125855.26	36449.51	31186	111385.37	94669.26
6 15-JAN-22	6	145323.62	123220.1	33608.14	28720	111715.46	94500.1
7 15-JAN-22	7	132131.04	112593.85	34376.62	29360	97754.42	83233.82
8 15-JAN-22	8	132896.92	114115.31	32744.14	27997	100152.76	86118.3
9 15-JAN-22	9	153965.11	130867.66	36877.7	31548	117087.39	99319.65
10 15-JAN-22	10	127793.78	108453.11	33890.61	28883	93903.13	79570.11
11 15-JAN-22	11	132906.49	112942.12	33369.65	28411	99536.84	84531.12
12 15-JAN-22	12	163928.1	139695.96	34400.07	29308	129528.07	110387.95
13 15-JAN-22	13	140306.03	119031.65	31581.3	27109	108724.72	91922.64
14 15-JAN-22	14	138978.04	118274.58	35252.25	30051	103725.8	88223.57
15 15-JAN-22	15	156084.55	132620.71	33609.47	28450	122475.11	103970.7
16 15-JAN-22	16	163054.8	138792.07	34313.68	29307	128741.11	109485.07
17 16-JAN-22	1	140428.78	119741.92	34297	29349	106131.78	90392.92
18 16-JAN-22	2	132210.19	112867.2	32837.57	28043	99372.61	84824.18
19 16-JAN-22	3	136379.09	115509.08	31202.76	26682	105176.34	88827.06
20 16-JAN-22	4	125938.7	106910.7	35921.21	30639	90017.47	76271.7
21 16-JAN-22	5	132966	113190.53	32186.27	27505	100779.77	85685.52
22 16-JAN-22	6	166173.46	141710.9	35439.61	30298	130733.88	111412.88
23 16-JAN-22	7	122223.45	104258.71	30926	26463	91297.52	77795.7
24 16-JAN-22	8	138861.87	117073.11	36331.4	30646	102888.68	88004.05

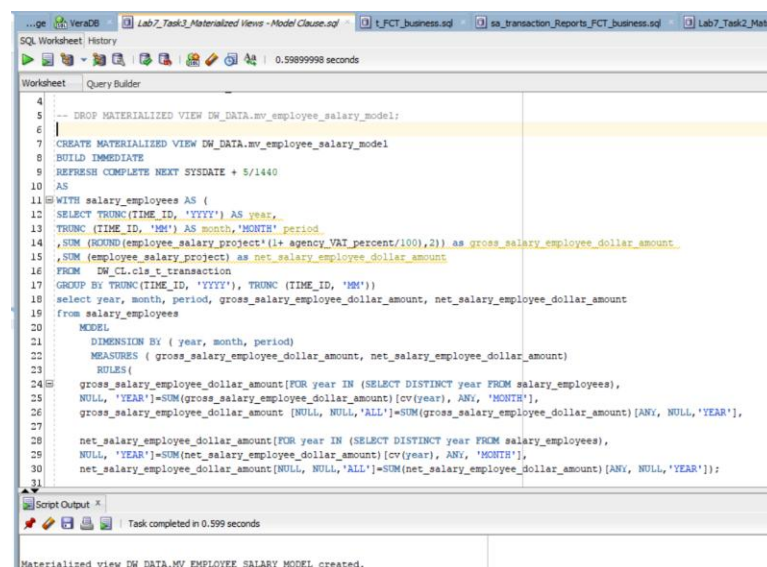
### 3. Materialized Views- Model Clause

#### 3.1. Task 03: Create Materialized Views - Refreshing at definitive Time moment

Grant rights to user DW\_DATA to create a materialized view.



Create Materialized View by Model Clause, in which the data is updated every 5 minutes.





32

SELECT \* FROM DW\_DATA.mv\_employee\_salary\_model ORDER BY 1,2,3;

Script Output x Query Result x

All Rows Fetched: 9 in 0.016 seconds

	YEAR	MONTH	PERIOD	GROSS_SALARY_EMPLOYEE_DOLLAR_AMOUNT	NET_SALARY_EMPLOYEE_DOLLAR_AMOUNT
1	01-JAN-22	01-JAN-22	MONTH	16740345.73	14286455
2	01-JAN-22	01-FEB-22	MONTH	15139839.59	12919417
3	01-JAN-22	01-MAR-22	MONTH	16782887.55	14324052
4	01-JAN-22	01-APR-22	MONTH	16197508.94	13823913
5	01-JAN-22	01-MAY-22	MONTH	16768528.37	14313747
6	01-JAN-22	01-JUN-22	MONTH	16224818.16	13847563
7	01-JAN-22	01-JUL-22	MONTH	10340195.31	8826010
8	01-JAN-22	(null)	YEAR	108194123.65	92341157
9	(null)	(null)	ALL	108194123.65	92341157

Let's update the data. Let's increase employee salaries for January 2022 by 1 percent.

34	UPDATE DW_CL.cis_t_transaction
35	SET employee_salary_project = employee_salary_project*1.01
36	WHERE TIME_ID >= to_date( '01/01/2022', 'dd/mm/yyyy' ) AND TIME_ID < to_date( '31/01/2022', 'dd/mm/yyyy' );

Script Output x Query Result x

Task completed in 1.067 seconds

Session altered.

Grant succeeded.

Materialized view DW\_DATA.MV\_EMPLOYEE\_SALARY\_MODEL created.

50,400 rows updated.

Immediately after updating an employee's salary, there is no change in the view.


38

SELECT \* FROM DW\_DATA.mv\_employee\_salary\_model ORDER BY 1,2,3;

39

Script Output x

Query Result x

 All Rows Fetched: 9 in 0.008 seconds

YEAR	MONTH	PERIOD	GROSS_SALARY_EMPLOYEE_DOLLAR_AMOUNT	NET_SALARY_EMPLOYEE_DOLLAR_AMOUNT
1	01-JAN-22	01-JAN-22 MONTH	16740345.73	14286455
2	01-JAN-22	01-FEB-22 MONTH	15139839.59	12919417
3	01-JAN-22	01-MAR-22 MONTH	16782887.55	14324052
4	01-JAN-22	01-APR-22 MONTH	16197508.94	13823913
5	01-JAN-22	01-MAY-22 MONTH	16768528.37	14313747
6	01-JAN-22	01-JUN-22 MONTH	16224818.16	13847563
7	01-JAN-22	01-JUL-22 MONTH	10340195.31	8826010
8	01-JAN-22	(null) YEAR	108194123.65	92341157
9	(null)	(null) ALL	108194123.65	92341157

U02\Lab\_7\scripts\Lab7\_Task3\_Materialized Views - Model Clause.sql

Line 37 Column 1

Insert

Modified

Windows: G

71°F Clear

11:28 PM

8/16/2022

After 5 minutes, we see that the salaries for January have been updated.

38

SELECT \* FROM DW\_DATA.mv\_employee\_salary\_model ORDER BY 1,2,3;

39

Script Output x

Query Result x

SQL

All Rows Fetched: 9 in 0.009 seconds

	YEAR	MONTH	PERIOD	GROSS_SALARY_EMPLOYEE_DOLLAR_AMOUNT	NET_SALARY_EMPLOYEE_DOLLAR_AMOUNT
1	01-JAN-22	01-JAN-22	MONTH	16902432.44	14424775.44
2	01-JAN-22	01-FEB-22	MONTH	15139839.59	12919417
3	01-JAN-22	01-MAR-22	MONTH	16782887.55	14324052
4	01-JAN-22	01-APR-22	MONTH	16197508.94	13823913
5	01-JAN-22	01-MAY-22	MONTH	16768528.37	14313747
6	01-JAN-22	01-JUN-22	MONTH	16224818.16	13847563
7	01-JAN-22	01-JUL-22	MONTH	10340195.31	8826010
8	01-JAN-22	(null)	YEAR	108356210.36	92479477.44
9	(null)	(null)	ALL	108356210.36	92479477.44

\\J02\lab\_7\scripts\lab7\_Task3\_Materialized Views - Model Clause.sql

Line 37 Column 1

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Modified

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