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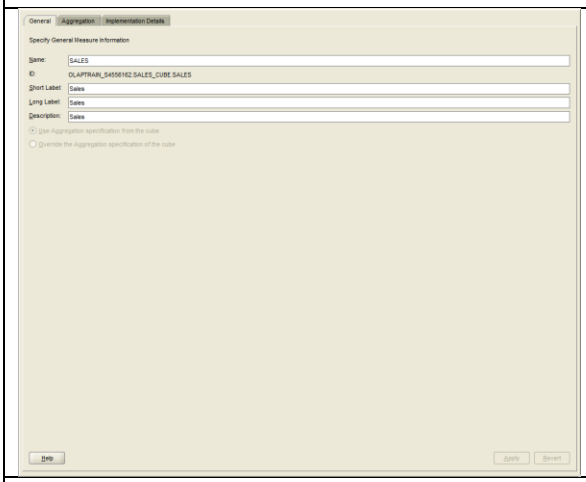
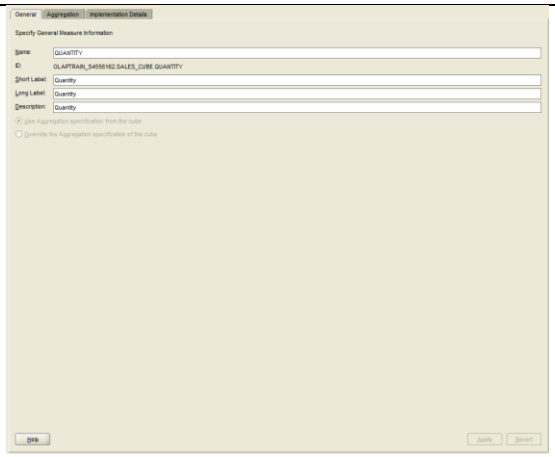
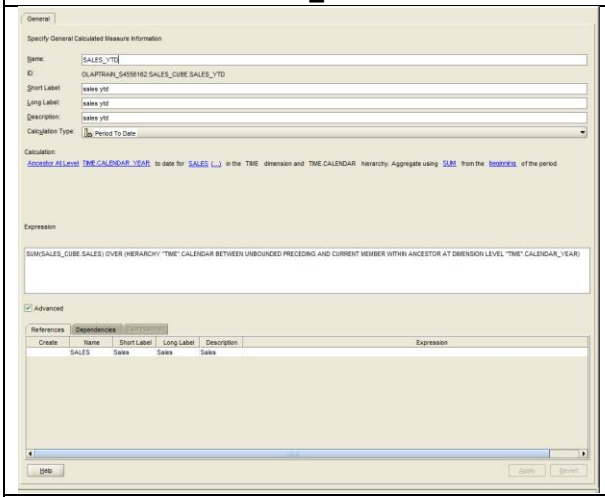
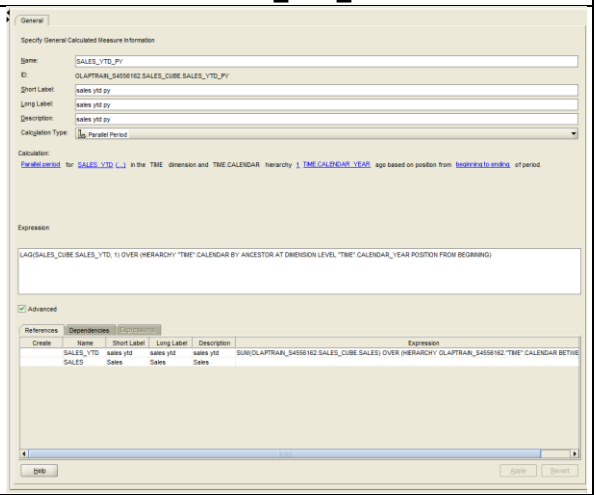
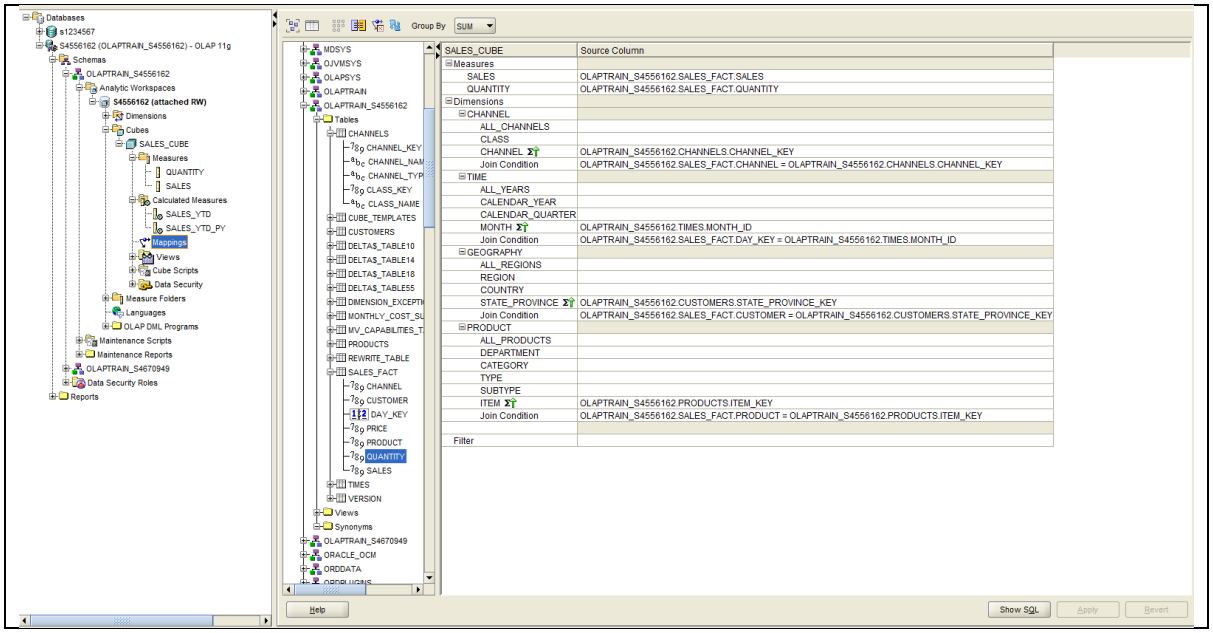
Practical 2 Report

Task 1

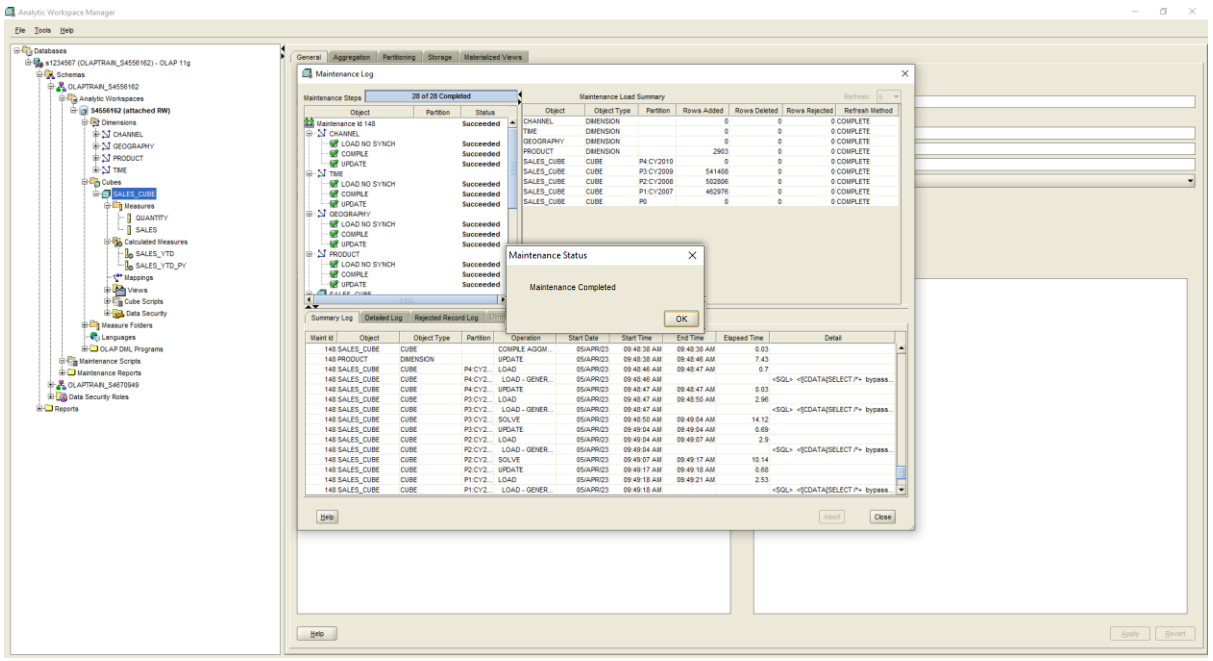
The following table outlines the stored measures, calculated measures and mapped cube. The outlined steps in the Practice 2 task sheet were followed for these screenshots. It is important that the cube has been mapped appropriately as this data structure will be further used for calculations and queries. For this reason, the stored measures and calculated measures needed to be specified before the cube could be mapped, as these values and queries were utilised to ensure the cube was mapped appropriately.

<table>
<tr><th colspan="2">Stored Measures</th></tr>
<tr><th>SALES</th><th>QUANTITY</th></tr>
<tr><td>  </td><td>  </td></tr>
<tr><th colspan="2">Calculated Measures</th></tr>
<tr><th>SALES_YTD</th><th>SALES_YTD_PY</th></tr>
<tr><td>  </td><td>  </td></tr>
<tr><th colspan="2">Mapped Cube</th></tr>
</table>



Task 2

The following outlines the successfully maintained cube. The outlined steps in the Practice 2 task sheet were followed for this screenshot. It is important to note that the cube must be maintained before further queries or calculations, as this step loads the mapped data onto the cube. Similarly, it is important to note that views are also included in this step – these will be primarily used for further queries in Task 4. Further, views aggregate table data and hence are more effective for queries – as the complexity of the data is reduced.



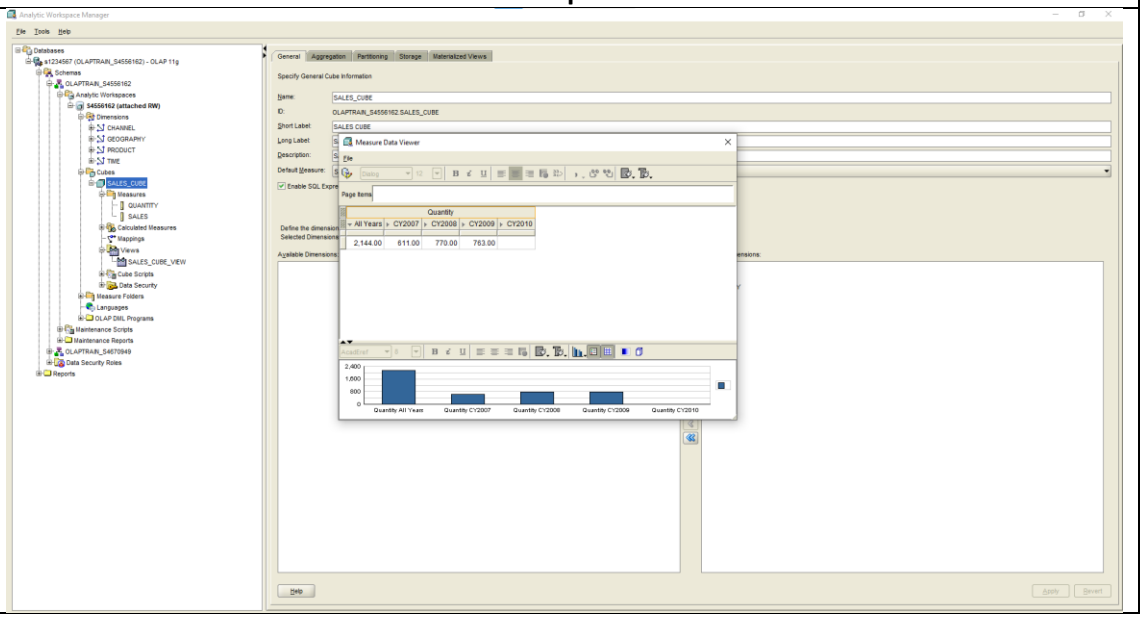
Task 3

Task 3.1

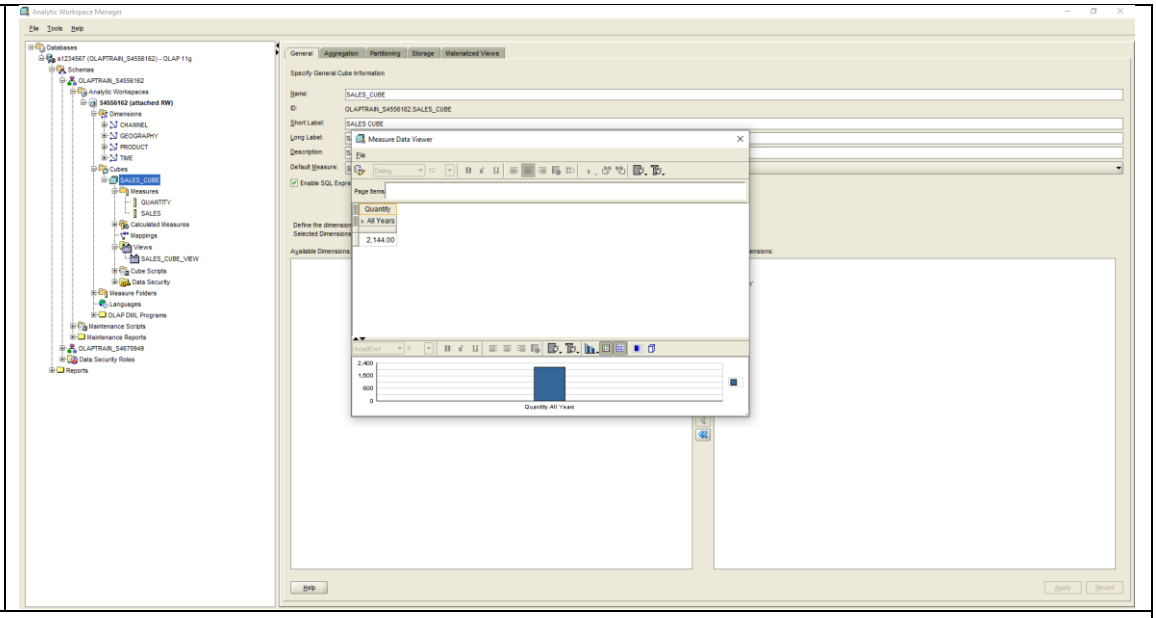
Prior to demonstrating roll-up, drill-down and pivot, these are defined as following, in accordance to Lecture 5, Page 43.

- Roll-Up: “Move up concept hierarchy, grouping into larger units along a dimension with more generalization”
- Drill-Down: “Disaggregate to a finer-grained view to show more details”
- Pivoting (cross tabulation): “Rotate data cube to show a different orientation of axes”

Hence, these can be demonstrated via the cube that has just been maintained as the data has now been successfully loaded on the mapped cube from Task 1. In the roll-up and drill-down examples, it is important to note that the arrow visible (for the ‘All Years’ value) can simply be closed and opened respectively, in accordance with the definition from above. Further, pivot is slightly different, in that a different orientation of the axes needs to be visible. For this to be demonstrated, the process is not as simple. Firstly, the x and y axis’ must be reassigned (i.e. the former x = new y, and the former y = new x) and secondly, the summation of the originally visible values must be done such that a new axes (or hierarchy in the data cube) is shown (Tutorial 4 Solutions, Page 17 – Tutorial 4, Question 2). These three operations are demonstrated in the table below and the transformation is specified with the before and after screenshots.

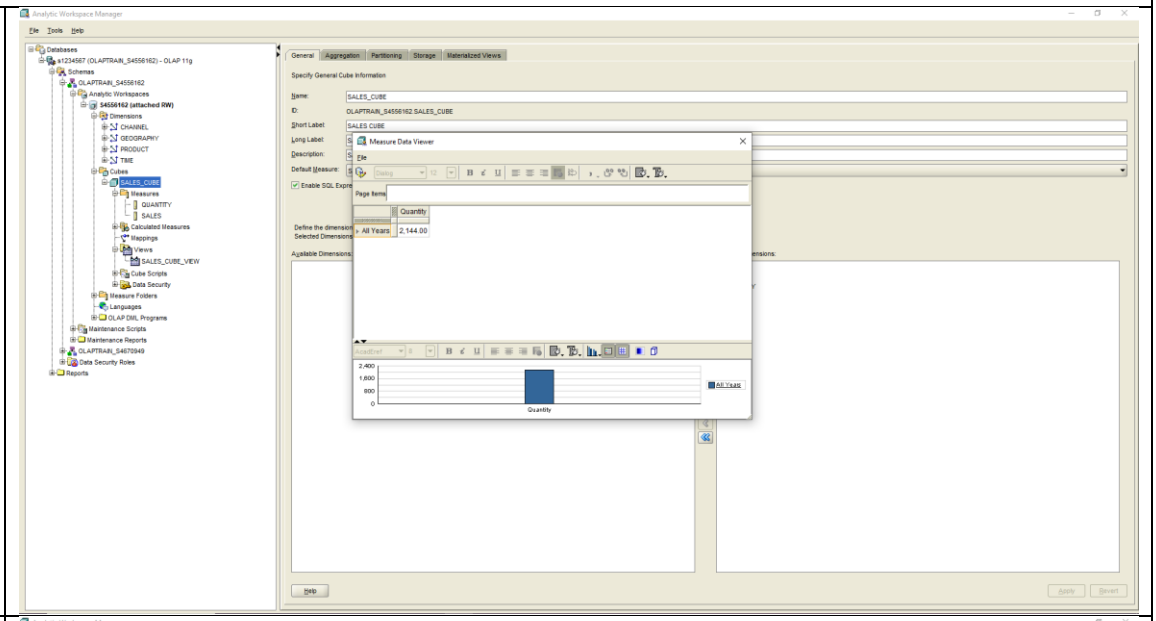
Roll-Up	
BEFORE	

AFTER

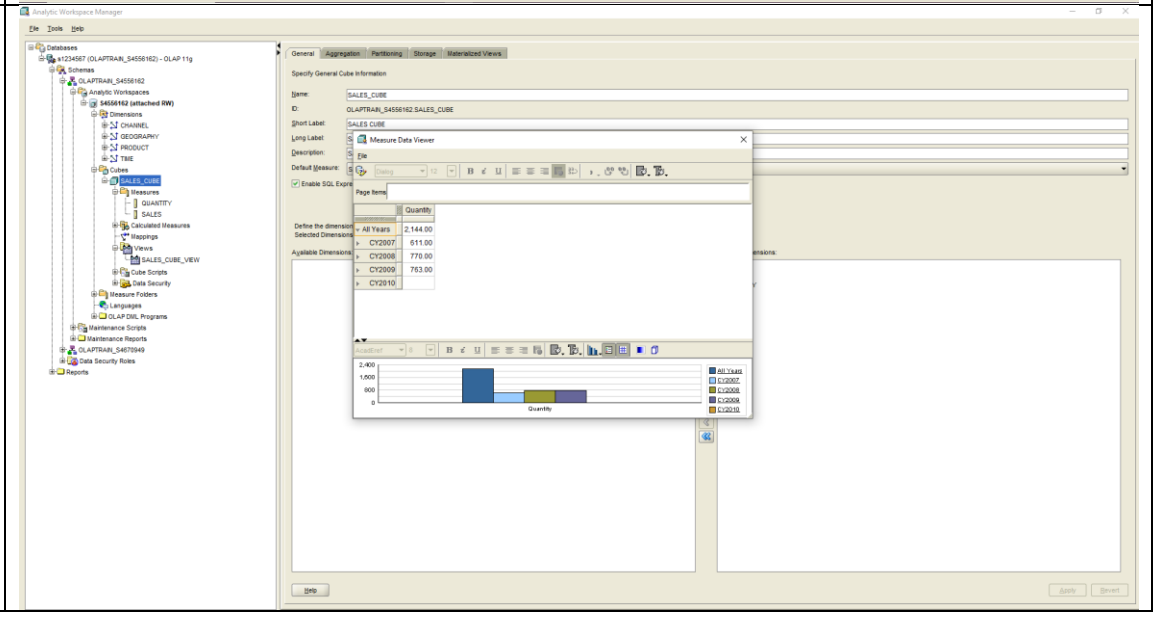


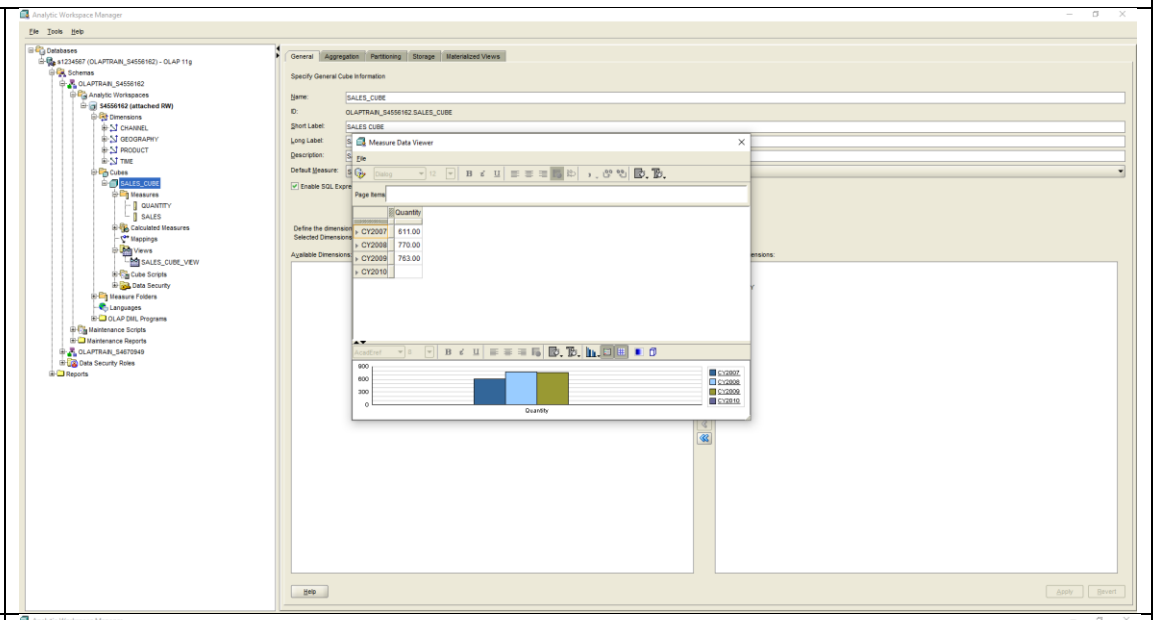
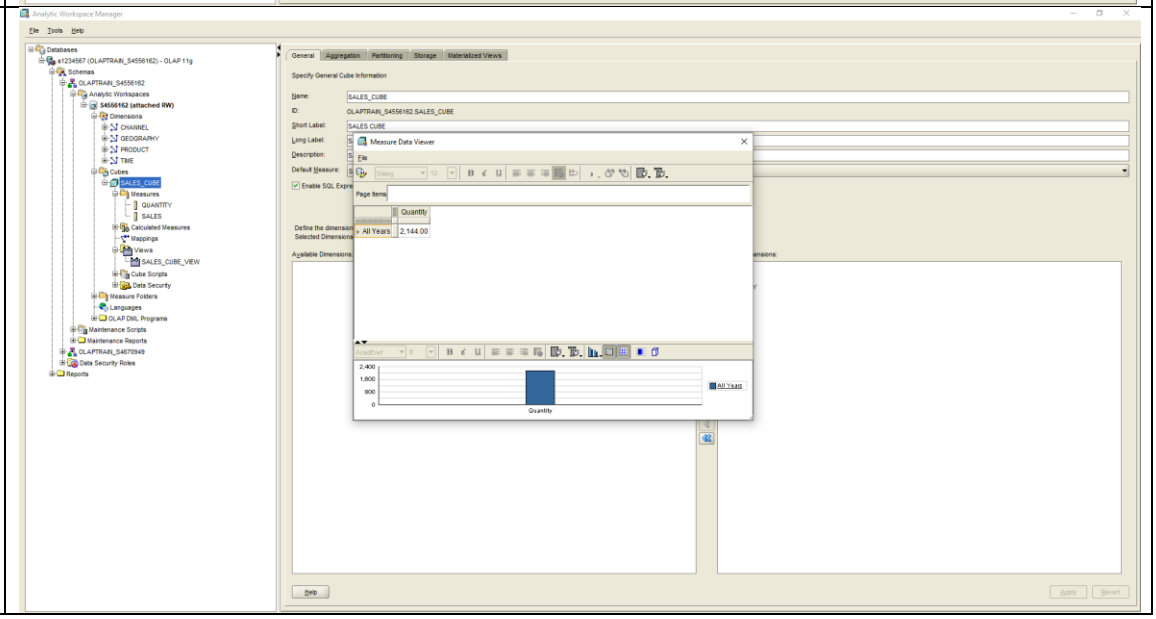
Drill-Down

BEFORE



AFTER



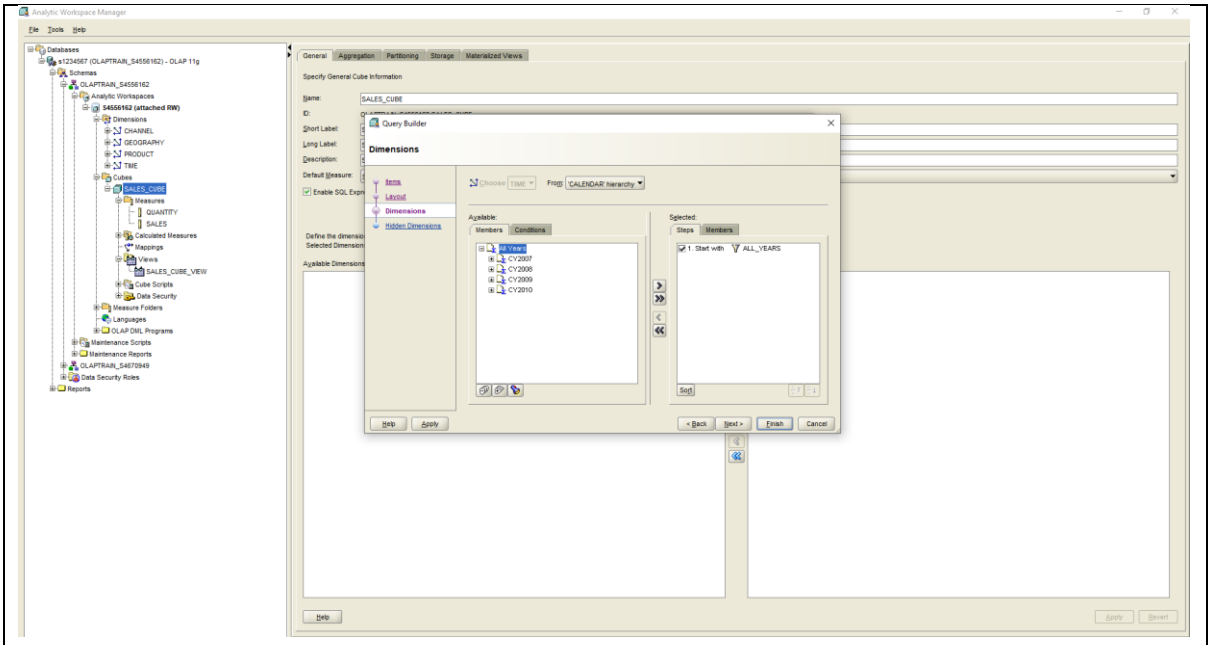
Pivot	
BEFORE	
AFTER	

Task 3.2

Along with the instructions specified in the Practice 2 task sheet, the primary tools used for this section are the query builder's dimensions and layout tools. Further, Part A refers to the first specified view, while Part B refers to the second specified view. It is important to note that the query builder's item and hidden dimensions tools were used to reached the following views, though this was primarily to ensure that the correct views are displayed – such as for Part A) only the time and quantity dimensions are needed (with other cube loaded dimensions being hidden), while in Part B many more dimensions are needed time, quantity and geography (with the other dimensions being hidden). It is important to note that measures value is needed for mathematical purposes, while the quantity displays the notable values for the appropriate dimension selection. Quantity is not necessarily a dimension itself, unlike time and geography highlighted here for this task.

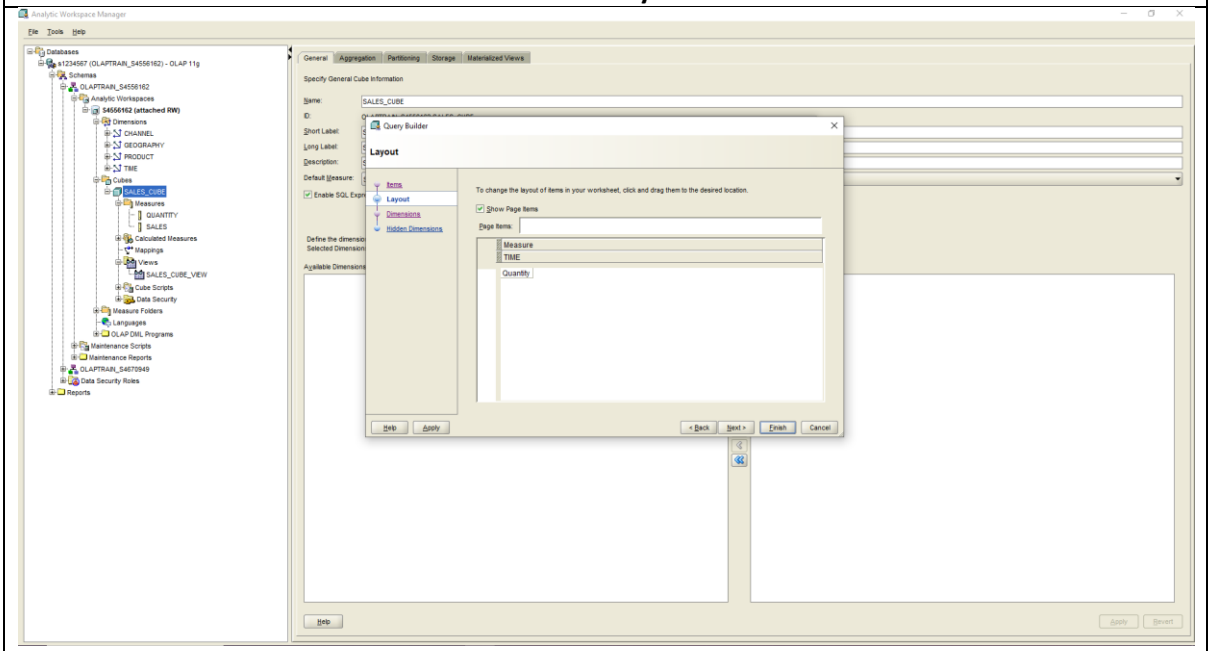
Part A

STEP 1: Dimensions (View's Parameters)



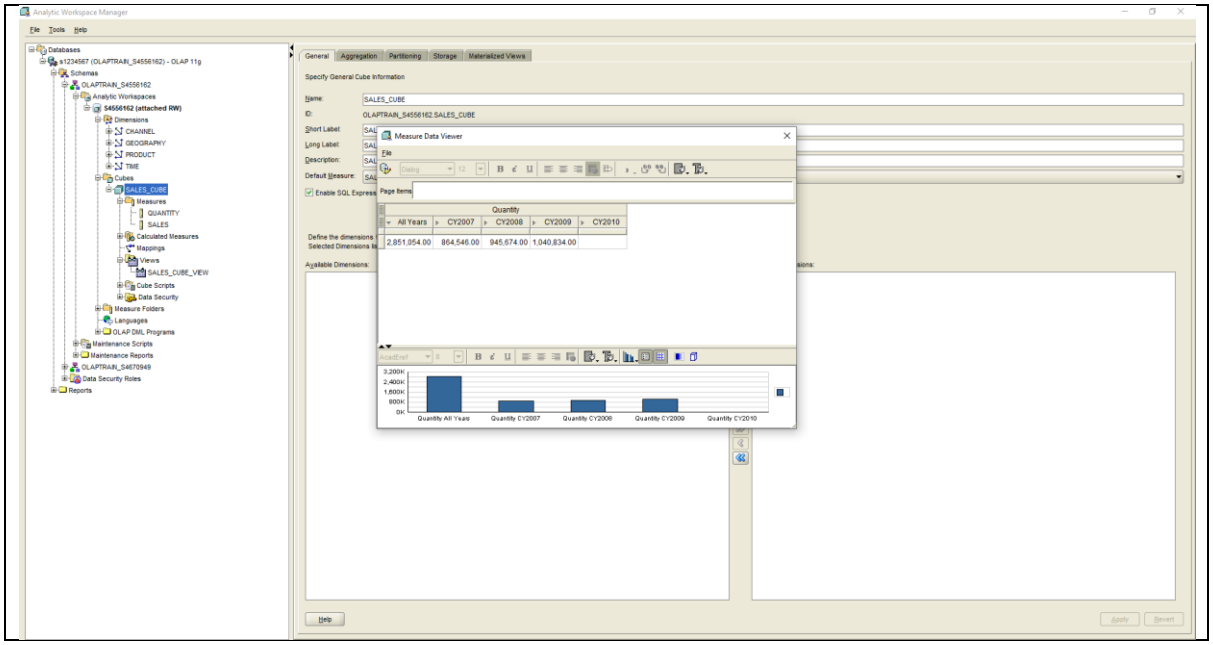
- NOTE: ALL_YEARS remaining at the same hierarchical level in the cube, as this needs to be visible in the final view.

STEP 2: Layout



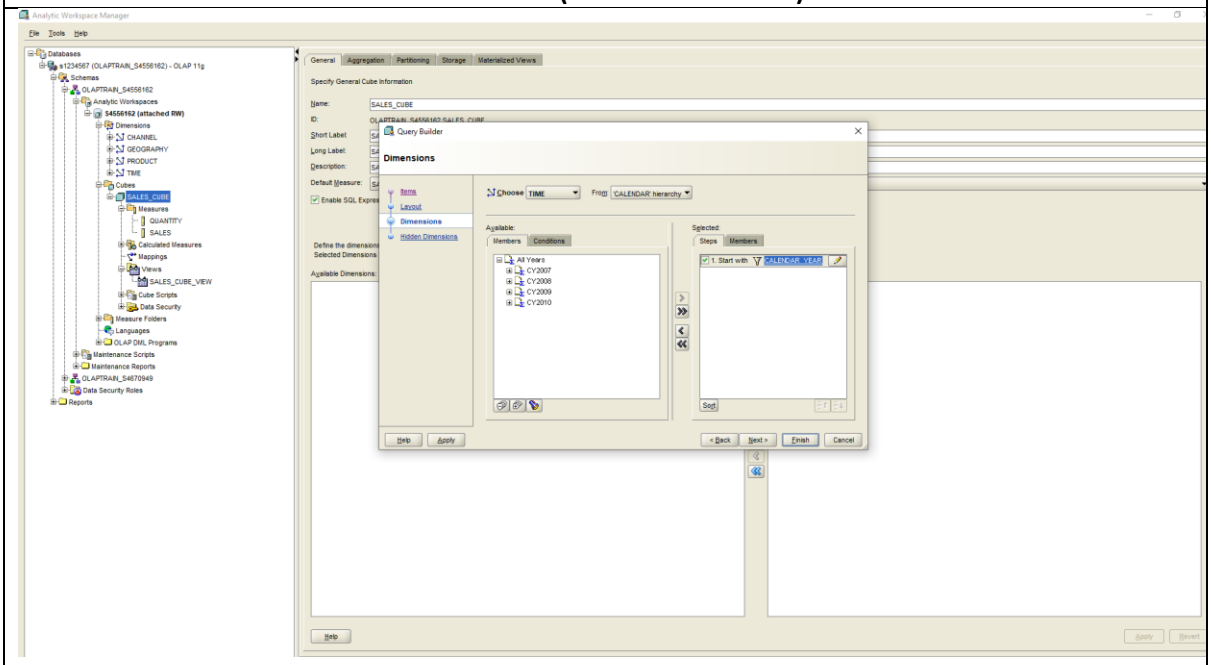
- NOTE: This ensures that the dimensions (view's parameters) are in the appropriate location in accordance with the final view result.
- Further, due to the fact that ALL_YEARS remains at the same hierarchical level, it is possible to perform a drill-down operation (expanding out the highest hierarchical level) to achieve the final result demonstrated.

STEP 3: Resultant View

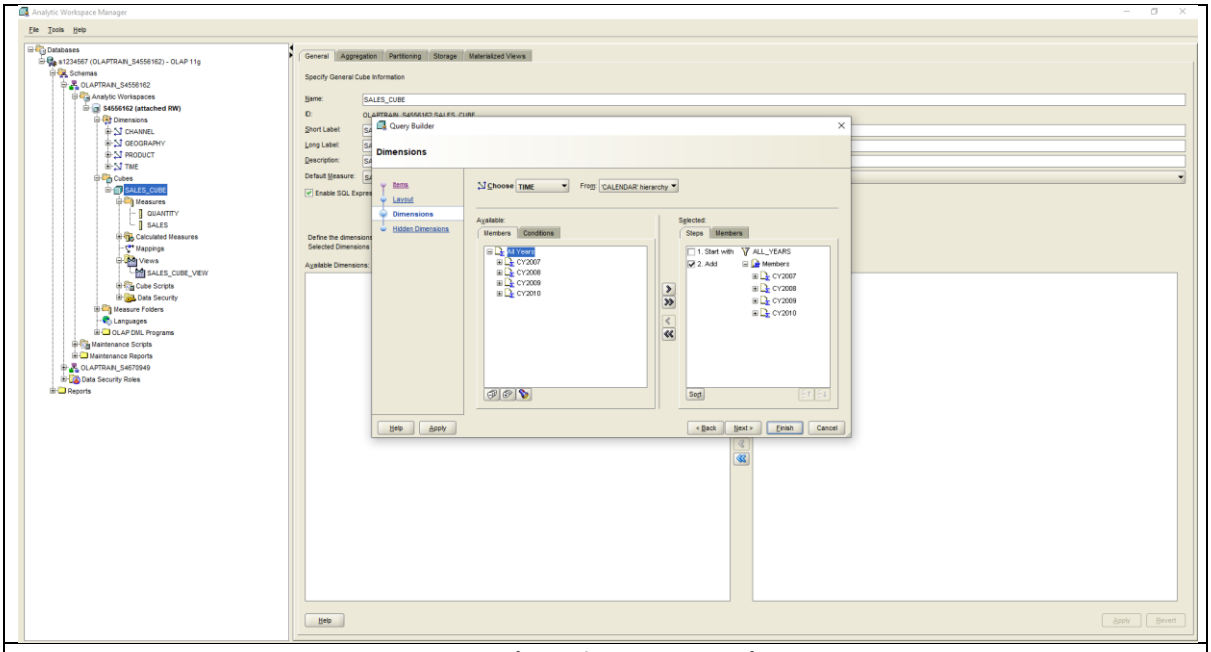


Part B

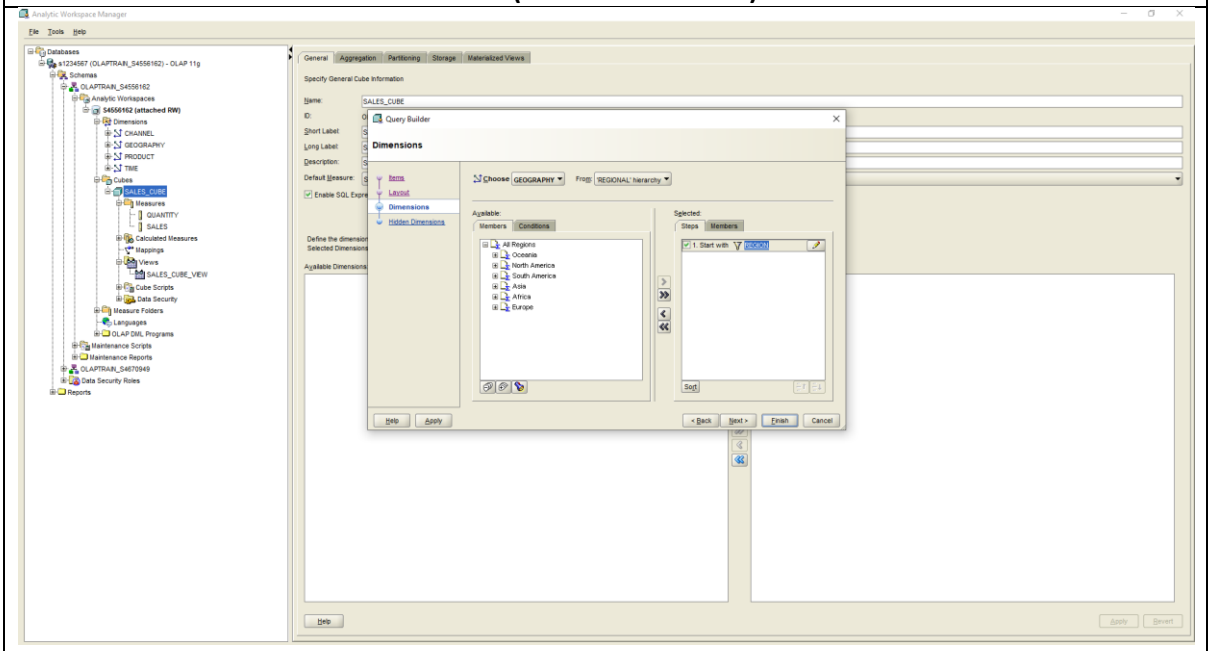
STEP 1: Dimensions (View's Parameters) – TIME



- NOTE: ALL_YEARS does not remain at the same hierarchical level in the cube, and a hierarchical level below ALL_YEARS called CALENDAR_YEAR needs to be visible in the final view. Hence this was appropriately changed and signified in the right-hand side of the query builder panel.
- It is possible to manually select the year values (via the ADD function, deselecting the START WITH column) to achieve the same result in the final view, though this process is tedious and malpractice (Sanghvi et al., 2022) and is simplified by the fact that one level lower hierarchy can be selected.

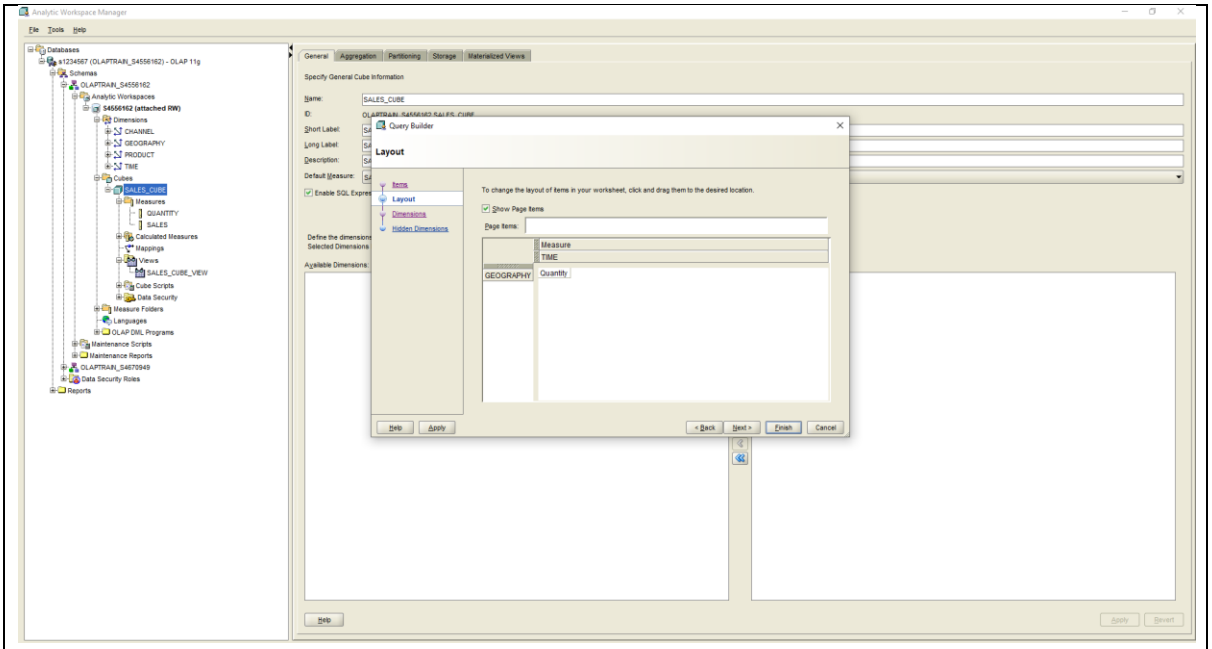


STEP 1: Dimensions (View's Parameters) – GEOGRAPHY



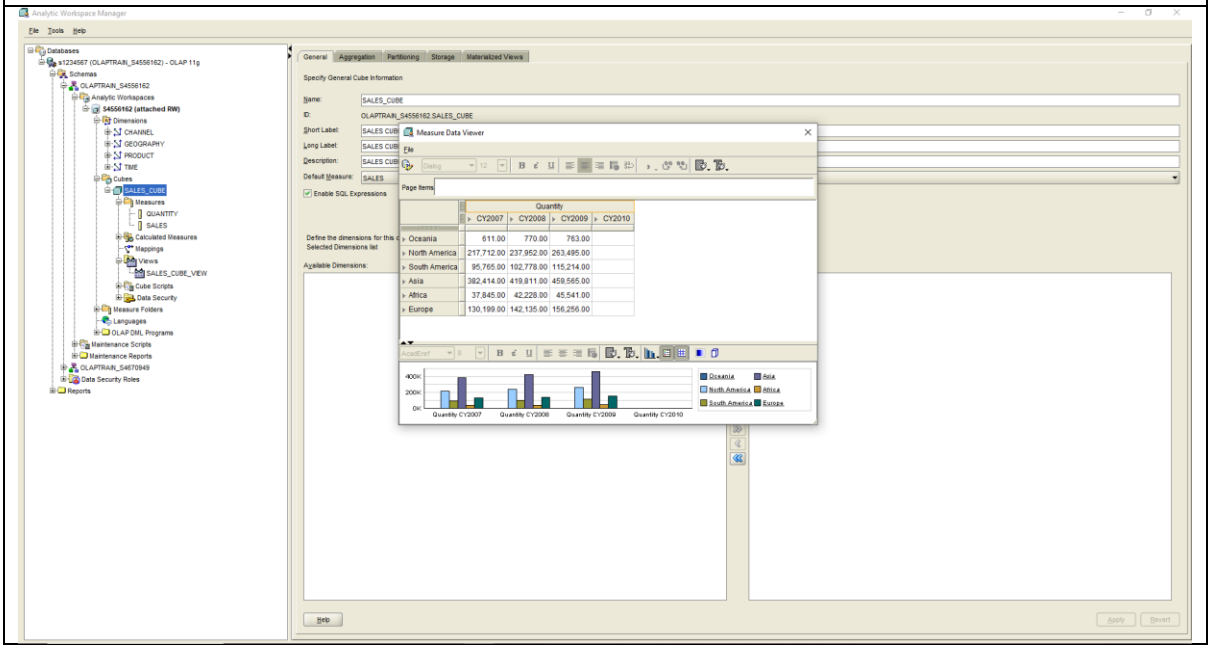
- NOTE: ALL_REGIONS does not remain at the same hierarchical level in the cube, and a hierarchical level below ALL_REGIONS called REGION needs to be visible in the final view. Hence this was appropriately changed and signified in the right-hand side of the query builder panel.
- It is possible to manually select the region values (via the ADD function, deselecting the START WITH column) to achieve the same result in the final view, though this process is tedious and malpractice (Sanghvi et al., 2022) and is simplified by the fact that one level lower hierarchy can be selected. This process is the same as the example demonstrated above with the time dimension.

STEP 2: Layout



- NOTE: This ensures that the dimensions (view's parameters) are in the appropriate location in accordance with the final view result.
- Further, due to the fact that ALL_YEARS and ALL_REGIONS do not remain at the same hierarchical level, it is not possible to perform a direct drill-down operation (expanding out the highest hierarchical level) to achieve the final result demonstrated, though it is possible to roll-up back to ALL_YEARS and ALL_REGIONS from their respective selected sub-sets (CALENDAR_YEAR and REGION). This further applies to other parts of the cube.

STEP 3: Resultant View



Task 4

Sample Query (cube_queries.sql) – Given in Practical 2 Task Sheet

```
SELECT p.department_long_descript as
dept,
     s.sales
FROM PRODUCT_STANDARD_VIEW p,
    SALES_CUBE_VIEW s
WHERE(p.dim_key = s.product
 AND p.LEVEL_NAME = 'DEPARTMENT'
 AND s.channel = 'ALL_CHANNELS'
 AND s.geography = 'ALL_REGIONS'
 AND s.time = 'ALL_YEARS');
```

```
SELECT p.department_long_descript as dept,
       s.sales
FROM PRODUCT_STANDARD_VIEW p,
     SALES_CUBE_VIEW s
WHERE(p.dim_key = s.product
 AND p.LEVEL_NAME = 'DEPARTMENT'
 AND s.channel = 'ALL_CHANNELS'
 AND s.geography = 'ALL_REGIONS'
 AND s.time = 'ALL_YEARS');
```

DEPT	SALES
Portable Music and Video	49286079.48
Cameras and Camcorders	31820248.4
Computers	336408689.4

Final Query – as specified on the Practical 2 Task Sheet

```
SELECT c.class_short_description as class,
p.department_long_descript as dept,
t.calendar_quarter_long_de as qtr,
round(s.sales) as sales
FROM channel_view c, product_view p, time_view t, sales_cube_view s, geography_view g

WHERE p.level_name = 'DEPARTMENT'
AND c.level_name = 'CLASS'
AND g.level_name = 'ALL_REGIONS'
AND t.level_name = 'CALENDAR_QUARTER'
AND s.channel = c.dim_key
AND s.product = p.dim_key
AND s.time = t.dim_key
AND s.geography = g.dim_key
AND t.calendar_quarter_long_de LIKE '%CY2009%'
ORDER BY class, dept, qtr;
```

```
SELECT c.class_short_description as class,
p.department_long_descript as dept,
t.calendar_quarter_long_de as qtr,
round(s.sales) as sales
FROM channel_view c, product_view p, time_view t, sales_cube_view s, geography_view g

WHERE p.level_name = 'DEPARTMENT'
AND c.level_name = 'CLASS'
AND g.level_name = 'ALL_REGIONS'
AND t.level_name = 'CALENDAR_QUARTER'
AND s.channel = c.dim_key
AND s.product = p.dim_key
AND s.time = t.dim_key
AND s.geography = g.dim_key
AND t.calendar_quarter_long_de LIKE '%CY2009%'
ORDER BY class, dept, qtr;
```

CLASS	DEPT	QTR	SALES
Direct	Cameras and Camcorders	Q1-CY2009	1242385
Direct	Cameras and Camcorders	Q2-CY2009	1125521
Direct	Cameras and Camcorders	Q3-CY2009	1354490
Direct	Cameras and Camcorders	Q4-CY2009	1443028
Direct	Computers	Q1-CY2009	13917490
Direct	Computers	Q2-CY2009	11756607
Direct	Computers	Q3-CY2009	12865030
Direct	Computers	Q4-CY2009	14308176
Direct	Portable Music and Video	Q1-CY2009	1945639
Direct	Portable Music and Video	Q2-CY2009	1666430
Direct	Portable Music and Video	Q3-CY2009	1812649
Direct	Portable Music and Video	Q4-CY2009	2045273
Indirect	Cameras and Camcorders	Q1-CY2009	1719385
Indirect	Cameras and Camcorders	Q2-CY2009	1573766
Indirect	Cameras and Camcorders	Q3-CY2009	1837557
Indirect	Cameras and Camcorders	Q4-CY2009	2097116
Indirect	Computers	Q1-CY2009	19859709
Indirect	Computers	Q2-CY2009	16824419
Indirect	Computers	Q3-CY2009	18117883
Indirect	Computers	Q4-CY2009	20257301
Indirect	Portable Music and Video	Q1-CY2009	2747134
Indirect	Portable Music and Video	Q2-CY2009	2323586
Indirect	Portable Music and Video	Q3-CY2009	2500406
Indirect	Portable Music and Video	Q4-CY2009	2878119

24 rows selected

References

Sanghvi Y., Agarwal, S., Faraz, M., Fatunmbi, T. (2022, December 29). Working with Hierarchical Database Systems Simplified 101. HevoData. Retrieved April 20, 2023, from https://hevodata.com/learn/hierarchical-database-systems/