DATABASE MANAGEMENT – LAB 05

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Yêu cầu:

1. Tạo các view sau :
   - uvw_DetailProductInOrder với các cột sau OrderId, OrderNumber, OrderDate, ProductId, ProductInfo (= ProductName + Package. Ví dụ: Chai 10 boxes x 20 bags), UnitPrice và Quantity

```
-- 1. Tạo các view sau:
-
-       uvw_DetailProductInOrder với các cột sau OrderId, OrderNumber, OrderDate, ProductId
,
-
-       ProductInfo (= ProductName + Package. Ví dụ: Chai 10 boxes x 20 bags), UnitPrice và
--       Quantity.
CREATE VIEW uvw_DetailProductInOrder
AS
    SELECT OJ.Id AS [OrderId], OJ.OrderNumber, OJ.OrderDate, OJ.ProductId,
            P.ProductName + SPACE(1) + P.Package AS [ProductInfo],
            OJ.UnitPrice, OJ.Quantity
    FROM (
        SELECT O.Id, O.OrderDate, O.OrderNumber, OI.ProductId, OI.UnitPrice, OI.Quantity
        FROM [Order] O
        INNER JOIN OrderItem OI ON O.Id = OI.OrderId
    ) OJ
    INNER JOIN Product P ON P.Id = OJ.ProductId
GO

SELECT * FROM uvw_DetailProductInOrder
```

	OrderId	OrderNumber	OrderDate	ProductId	ProductInfo	UnitPrice	Quantity
1	1	542378	2012-07-04 00:00:00.000	11	Queso Cabrales 1 kg pkg.	14.00	12
2	1	542378	2012-07-04 00:00:00.000	42	Singaporean Hokkien Fried Me…	9.80	10
3	1	542378	2012-07-04 00:00:00.000	72	Mozzarella di Giovanni 24 - …	34.80	5
4	2	542379	2012-07-05 00:00:00.000	14	Tofu 40 - 100 g pkgs.	18.60	9
5	2	542379	2012-07-05 00:00:00.000	51	Manjimup Dried Apples 50 - 3…	42.40	40
6	3	542380	2012-07-08 00:00:00.000	41	Jack's New England Clam Chow…	7.70	10
7	3	542380	2012-07-08 00:00:00.000	51	Manjimup Dried Apples 50 - 3…	42.40	35
8	3	542380	2012-07-08 00:00:00.000	65	Louisiana Fiery Hot Pepper S…	16.80	15
9	4	542381	2012-07-08 00:00:00.000	22	Gustaf's Knäckebröd 24 - 500…	16.80	6
10	4	542381	2012-07-08 00:00:00.000	57	Ravioli Angelo 24 - 250 g pk…	15.60	15

   - uvw_AllProductInOrder với các cột sau OrderId, OrderNumber, OrderDate, ProductList (ví dụ "11,42,72" với OrderId 1), và TotalAmount (= SUM(UnitPrice * Quantity)) theo mỗi OrderId (Gợi ý dùng FOR XML PATH để tạo cột ProductList)

```
--      uvw_AllProductInOrder với các cột sau OrderId, OrderNumber, OrderDate, ProductList
--      (ví dụ "11,42,72" với OrderId 1), và TotalAmount (=SUM(UnitPrice * Quantity)) theo
--      mỗi OrderId.
CREATE VIEW uvw_AllProductInOrder
AS
    SELECT DISTINCT V1.OrderId, V1.OrderNumber, V1.OrderDate,
            STUFF((
```

```sql
            SELECT ',' + CONVERT (NVARCHAR(40), V2.ProductId) AS [text()]
            FROM uvw_DetailProductInOrder V2
            WHERE V1.OrderId = V2.OrderId
            FOR XML PATH('')
        ), 1, 1, '') AS ProductList,
        SUM(V1.UnitPrice * V1.Quantity) OVER (PARTITION BY V1.OrderId) AS TotalAmount
    FROM uvw_DetailProductInOrder V1
GO

SELECT * FROM uvw_AllProductInOrder
```

Results   Messages

	OrderId	OrderNumber	OrderDate	ProductList	TotalAmount
1	1	542378	2012-07-04 00:00:00.000	11,42,72	440.00
2	2	542379	2012-07-05 00:00:00.000	14,51	1863.40
3	3	542380	2012-07-08 00:00:00.000	41,51,65	1813.00
4	4	542381	2012-07-08 00:00:00.000	22,57,65	670.80
5	5	542382	2012-07-09 00:00:00.000	20,33,60	3730.00
6	6	542383	2012-07-10 00:00:00.000	31,39,49	1444.80
7	7	542384	2012-07-11 00:00:00.000	24,55,74	625.20
8	8	542385	2012-07-12 00:00:00.000	2,16,36,59	2490.50
9	9	542386	2012-07-15 00:00:00.000	53,77	517.80
10	10	542387	2012-07-16 00:00:00.000	27,39,77	1119.90

2. Dùng view "uvw_DetailProductInOrder" truy vấn những thông tin có OrderDate trong tháng 7.

```sql
-
- 2. Dùng view "uvw_DetailProductInOrder" truy vấn những thông tin có OrderDate trong tháng 7.
SELECT *, DATENAME(MONTH, OrderDate) AS [Month Name]
FROM uvw_DetailProductInOrder
WHERE MONTH(OrderDate) = 7
```

Results   Messages

	OrderId	OrderNumber	OrderDate	ProductId	ProductInfo	UnitPrice	Quantity	Month Name
1	1	542378	2012-07-04 00:00:00.000	11	Queso Cabrales 1 kg pkg.	14.00	12	July
2	1	542378	2012-07-04 00:00:00.000	42	Singaporean Hokkien Fried Me…	9.80	10	July
3	1	542378	2012-07-04 00:00:00.000	72	Mozzarella di Giovanni 24 - …	34.80	5	July
4	2	542379	2012-07-05 00:00:00.000	14	Tofu 40 - 100 g pkgs.	18.60	9	July
5	2	542379	2012-07-05 00:00:00.000	51	Manjimup Dried Apples 50 - 3…	42.40	40	July
6	3	542380	2012-07-08 00:00:00.000	41	Jack's New England Clam Chow…	7.70	10	July
7	3	542380	2012-07-08 00:00:00.000	51	Manjimup Dried Apples 50 - 3…	42.40	35	July
8	3	542380	2012-07-08 00:00:00.000	65	Louisiana Fiery Hot Pepper S…	16.80	15	July
9	4	542381	2012-07-08 00:00:00.000	22	Gustaf's Knäckebröd 24 - 500…	16.80	6	July
10	4	542381	2012-07-08 00:00:00.000	57	Ravioli Angelo 24 - 250 g pk…	15.60	15	July

3. Dùng view "uvw_AllProductInOrder" truy vấn những hóa đơn Order có ít nhất 3 product trở lên.

```sql
-
- 3. Dùng view "uvw_AllProductInOrder" truy vấn những hóa đơn Order có ít nhất 3 product t
rở lên.
SELECT V1.*, V2.[Number of Order]
FROM uvw_AllProductInOrder V1
INNER JOIN (
    SELECT DISTINCT OrderId, COUNT(value) OVER (PARTITION BY OrderId) AS [Number of Order]
    FROM uvw_AllProductInOrder
        CROSS APPLY STRING_SPLIT(ProductList, ',')
) V2 ON V1.OrderId = V2.OrderId
```

```sql
    WHERE V2.[Number of Order] >= 3
```

Results Messages

	OrderId	OrderNumber	OrderDate	ProductList	TotalAmount	Number of Order
1	1	542378	2012-07-04 00:00:00.000	11,42,72	440.00	3
2	3	542380	2012-07-08 00:00:00.000	41,51,65	1813.00	3
3	4	542381	2012-07-08 00:00:00.000	22,57,65	670.80	3
4	5	542382	2012-07-09 00:00:00.000	20,33,60	3730.00	3
5	6	542383	2012-07-10 00:00:00.000	31,39,49	1444.80	3
6	7	542384	2012-07-11 00:00:00.000	24,55,74	625.20	3
7	8	542385	2012-07-12 00:00:00.000	2,16,36,59	2490.50	4
8	10	542387	2012-07-16 00:00:00.000	27,39,77	1119.90	3
9	11	542388	2012-07-17 00:00:00.000	2,5,32	2018.60	3
10	13	542390	2012-07-19 00:00:00.000	41,57,62,70	1746.20	4

4. Hai view trên đã readonly chưa ? Có những cách nào làm hai view trên thành readonly ?

```sql
-- 4. Hai view trên đã readonly chưa? Có những cách nào làm hai view trên thành readonly?
SELECT TABLE_NAME, IS_UPDATABLE
FROM INFORMATION_SCHEMA.VIEWS
WHERE TABLE_NAME = 'uvw_AllProductInOrder' OR TABLE_NAME = 'uvw_DetailProductInOrder'
```

Results Messages

	TABLE_NAME	IS_UPDATABLE
1	uvw_AllProductInOrder	NO
2	uvw_DetailProductInOrder	NO

```
-- Comment --
-   + Hai view trên có một số field không là field đơn do đó giá trị biến IS_UPDATEABLE trả về
NO,
- nhưng ta vẫn có thể UPDATE giá trị đối với các field đơn khác. Do đó hai view trên không rea
donly.
-   + Có nhiều cách để làm hai view trên thành readonly. Dưới đây là 2 cách ví dụ để chuyển các
 field
-- đơn khác thành readonly:
-- (1) Dùng TRIGGER
```

```sql
CREATE TRIGGER uvw_DetailProductInOrder_Trigger_OnInsertOrUpdateOrDelete
ON uvw_DetailProductInOrder
INSTEAD OF INSERT, UPDATE, DELETE
AS
BEGIN
    RAISERROR('You are not allowed to insert, update, or delete through this view', 16, 1)
END

UPDATE uvw_DetailProductInOrder SET Quantity = 12
WHERE OrderId = 1 AND ProductId = 11
```

Messages

```
12:46:40 PM    Started executing query at Line 73
               Msg 50000, Level 16, State 1, Procedure uvw_DetailProductInOrder_Trigger_OnInsertOrUpdateOrDelete, Line 6
               You are not allowed to insert, update, or delete through this view
               (1 row affected)
               Total execution time: 00:00:00.016
```

```
-- (2) Thêm "UNION SELECT NULL,NULL,NULL,NULL,NULL,NULL,NULL WHERE 1 = 0" vào trong view
```

```sql
CREATE VIEW uvw_DetailProductInOrder_B
AS
    SELECT OJ.Id AS [OrderId], OJ.OrderNumber, OJ.OrderDate, OJ.ProductId,
            P.ProductName + SPACE(1) + P.Package AS [ProductInfo],
            OJ.UnitPrice, OJ.Quantity
```

```sql
    FROM (
        SELECT O.Id, O.OrderDate, O.OrderNumber, OI.ProductId, OI.UnitPrice, OI.Quantity
        FROM [Order] O
        INNER JOIN OrderItem OI ON O.Id = OI.OrderId
    ) OJ
    INNER JOIN Product P ON P.Id = OJ.ProductId
    UNION
    SELECT NULL, NULL, NULL, NULL, NULL, NULL, NULL WHERE 1 = 0
GO

UPDATE uvw_DetailProductInOrder_B SET Quantity = 12
WHERE OrderId = 1 AND ProductId = 11
```

Messages

```
12:47:38 PM    Started executing query at Line 92
               Msg 4406, Level 16, State 1, Line 1
               Update or insert of view or function 'uvw_DetailProductInOrder_B' failed because it contains a derived or constant field.
               Total execution time: 00:00:00.005
```

5. Thống kê về thời gian thực thi khi gọi hai view trên. View nào chạy nhanh hơn ?

```sql
-- 5. Thống kê về thời gian thực thi khi gọi hai view trên. View nào chạy nhanh hơn?
SET STATISTICS IO, TIME ON
GO

SELECT * FROM uvw_DetailProductInOrder
GO

SELECT * FROM uvw_AllProductInOrder
GO

SET STATISTICS IO, TIME OFF
GO
-
- Thời gian truy vấn của VIEW `uvw_DetailProductInOrder` là 25ms và của VIEW `uvw_AllProductIn
Order` là 33073ms
-- Do đó VIEW `uvw_DetailProductInOrder` chạy nhanh hơn.
```

12:49:04 PM   Started executing query at Line 96
               Commands completed successfully.
12:49:04 PM   Started executing query at Line 98
               SQL Server parse and compile time:
                  CPU time = 0 ms, elapsed time = 8 ms.
               (2155 rows affected)
               Table 'Workfile'. Scan count 0, logical reads 0, physical r
               read-ahead reads 0, lob page server read-ahead reads 0.
               Table 'Worktable'. Scan count 0, logical reads 0, physical
               read-ahead reads 0, lob page server read-ahead reads 0.
               Table 'OrderItem'. Scan count 1, logical reads 12, physical
               ob read-ahead reads 0, lob page server read-ahead reads 0.
               Table 'Order'. Scan count 1, logical reads 8, physical read
               d-ahead reads 0, lob page server read-ahead reads 0.
               Table 'Product'. Scan count 1, logical reads 3, physical re
               ead-ahead reads 0, lob page server read-ahead reads 0.

                SQL Server Execution Times:
                  CPU time = 0 ms, elapsed time = 25 ms.
12:49:04 PM   Started executing query at Line 101
               SQL Server parse and compile time:
                  CPU time = 0 ms, elapsed time = 9 ms.
               (830 rows affected)
               Table 'Worktable'. Scan count 2158, logical reads 16322, ph
               s 0, lob read-ahead reads 0, lob page server read-ahead rea
               Table 'OrderItem'. Scan count 2, logical reads 24, physical
               b read-ahead reads 0, lob page server read-ahead reads 0.
               Table 'Order'. Scan count 1, logical reads 4318, physical r
               read-ahead reads 0, lob page server read-ahead reads 0.

                SQL Server Execution Times:
                  CPU time = 31 ms, elapsed time = 33073 ms.
12:49:04 PM   Started executing query at Line 104
               SQL Server parse and compile time:
                  CPU time = 0 ms, elapsed time = 0 ms.
               Total execution time: 00:00:33.140