怎麼寫出一個好的 SQL

快速上手系列

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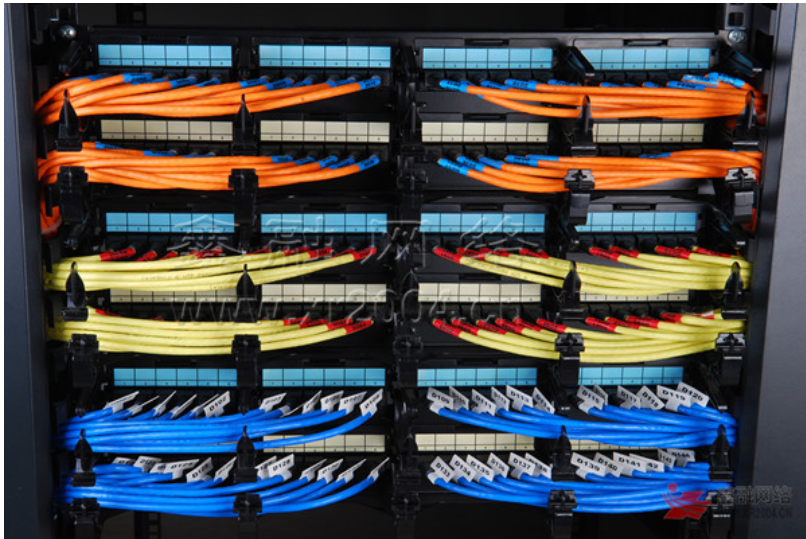
自我介紹

SQL Server
2013~

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台中、新竹、台北
技術分享

甚麼是好的 SQL 呢？

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常見的錯誤

- 沒有注意資料型別

- 建立一堆多餘索引

- 函數放錯位置

- 把 SQL 當成循序式的使用

型態錯誤的問題

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容易忽略的資料型別

- select 7+2 as A, '7'+'2' as B, 7+'2' as C

	A	B	C
1	9	72	9

- select 7/2 as A, 7/2.0 as B, 7/2*1.0 as C

	A	B	C
1	3	3.500000	3.0

範例資料表

Table1

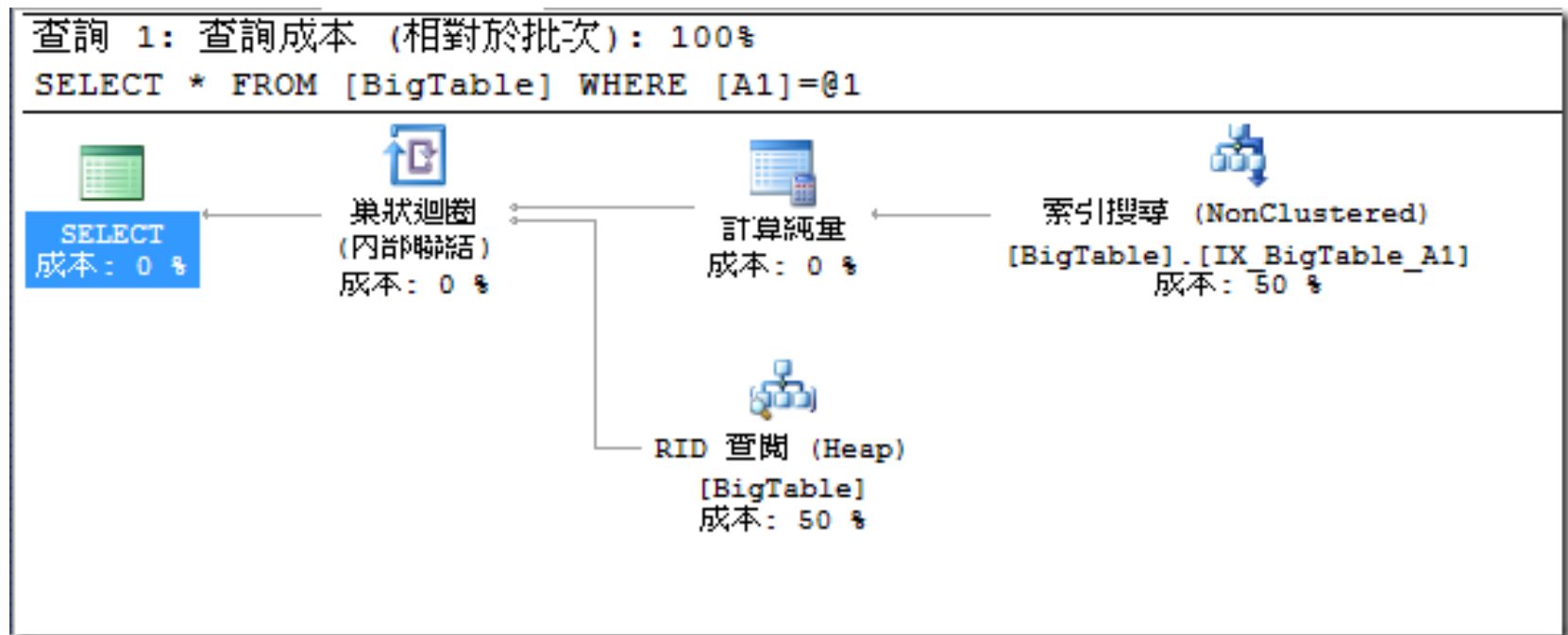| A1	A2	A3	A4
INT	NVARCHAR(10)	VARCHAR(10)	CHAR(10)

INDEX_A1 → A1

INDEX_A2 → A2

INDEX_A3 → A3
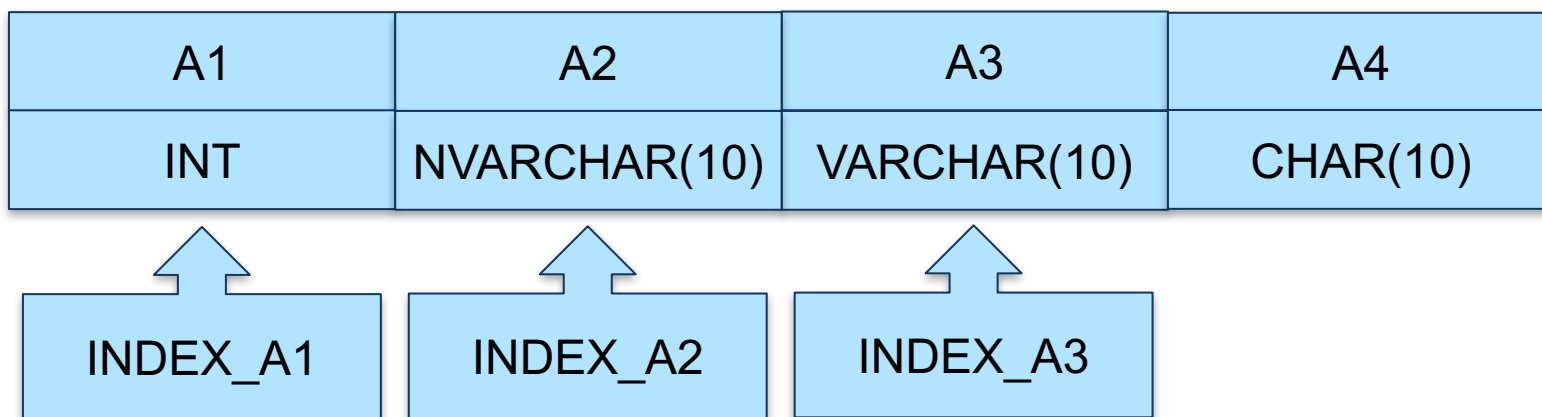
```sql
WHILE @K < 1000000
BEGIN
  INSERT INTO [BigTable] ( A1,A2,A3 )
    VALUES (@K,RIGHT('0000000000'+LTRIM(STR(@K)),10),RIGHT('0000000000'+LTRIM(STR(@K)),10));
  SET @K += 1;
END
```
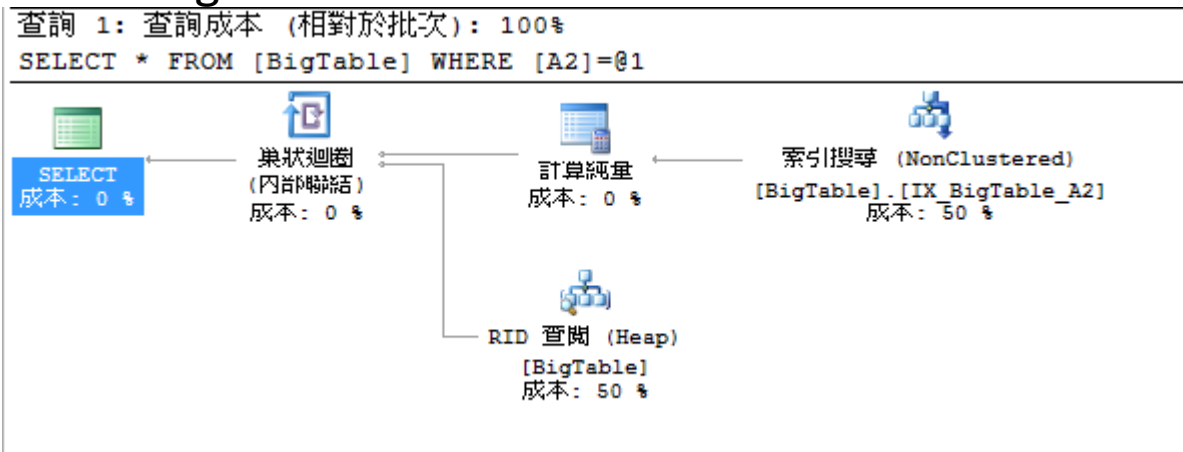
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範例一

```
SELECT * FROM BigTable WHERE A1 =  1234321

SELECT * FROM BigTable WHERE A1 = '1234321'
```


查詢 1: 查詢成本 (相對於批次): 100%
SELECT * FROM [BigTable] WHERE [A1]=@1

SELECT
成本: 0 %

巢狀迴圈
(內部聯結)
成本: 0 %

計算純量
成本: 0 %

索引搜尋 (NonClustered)
[BigTable].[IX_BigTable_A1]
成本: 50 %

RID 查閱 (Heap)
[BigTable]
成本: 50 %

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範例二

SELECT * FROM BigTable WHERE A2 = '1234321'

SELECT * FROM BigTable WHERE A2 = 1234321
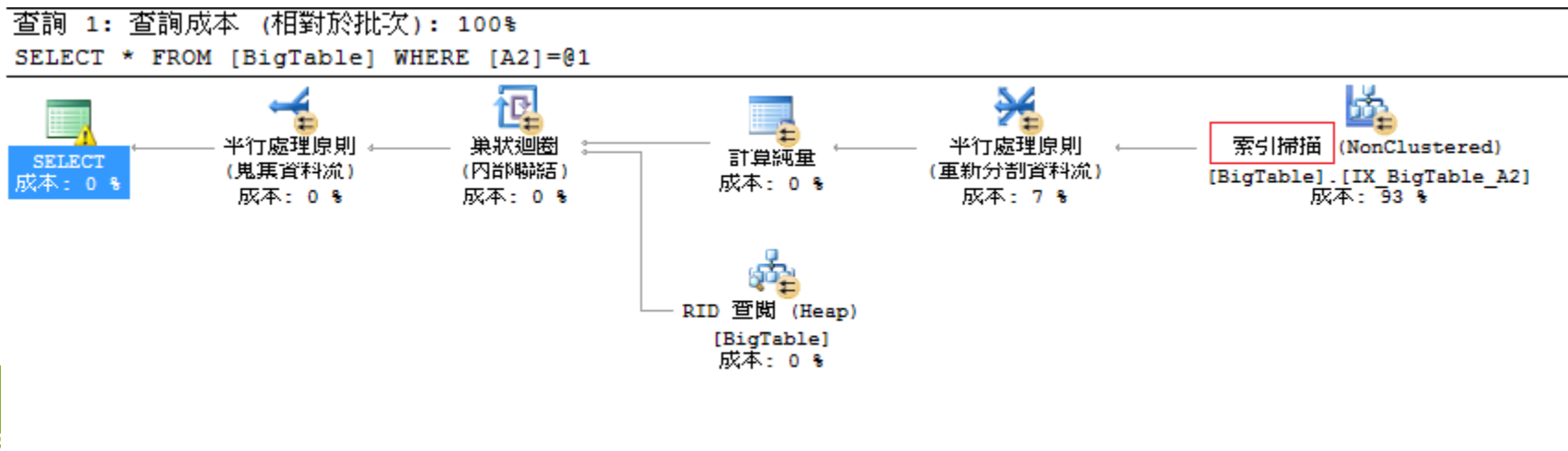
資料型態優先順序

1. 使用者自訂資料類型 (最高)
2. sql_varian t
3. xml
4. datetimeoffset
5. datetime2
6. datetime
7. smalldatetime
8. date
9. time
10. float
11. real
12. decimal
13. money
14. smallmoney
15. bigint
16. int
17. smallint
18. tinyint
19. bit
20. ntext
21. text
22. image
23. timestamp
24. uniqueidentifier
25. nvarchar (包括 nvarchar(max))
26. nchar
27. varchar (包括 varchar(max))
28. char
29. varbinary (包括 varbinary(max))
30. binary (最低)

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範例三

```sql
SELECT * FROM BigTable WHERE A3 Between  '0000013579' AND  '0000014680'
SELECT * FROM BigTable WHERE A3 Between N'0000013579' AND N'0000014680'
```
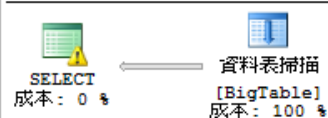
簡化複雜的 SQL

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CTE

- Common Table Expression
- SQL 2005 開始提供，ANSI SQL-99 標準。

WITH expression_name [(column_name [,...n])]
AS
(CTE_query_definition)

案例情境

OrderID	CustomID	EmployeeID	Seq	ItemID	Price
A01	客戶一	員工一	1	蘋果	100
			2	西瓜	150
			3	香蕉	100
A02	客戶一	員工一	1	草莓	100
			2	西瓜	200
			3	蘋果	100
			4	芒果	200

OrderID	CustomID	Price
A01	客戶一	350
A02	客戶一	600

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範例一

```sql
-- 銷售資料主檔
WITH OrdersTable( OrderID, CustomerID )
as
( Select OrderID, CustomerID
    from dbo.Orders
),
-- 銷售資料明細按照單號加總金額
OrderDetailsTable( OrderID, TotalPrice ) as
( Select OrderID, SUM(Price)
    from dbo.[Order Details] group by OrderID
)
Select *
From OrdersTable A
inner join OrderDetailsTable B on A.OrderID = B.OrderID
```

案例情境

	id	last_name	first_name	email	company	phone	address	city
1	1	Gray	Clarence	cgray0@rambler.ru	Jetpulse	1-(260)601-5114	02937 Merrick Avenue	Fort Wayne
2	2	Cooper	Emily	ecooper1@macromedia.com	Skippad	1-(251)614-5034	60 Forster Crossing	Mobile
3	3	Wilson	George	gwilson2@xinhuanet.com	Riffpath	1-(901)445-9881	52 Browning Center	Memphis
4	4	Mcdonald	Michael	mmcdonald3@twitter.com	Feedfire	1-(419)743-7314	85093 Jackson Park	Toledo
5	5	Tucker	Lori	ltucker4@etsy.com	Oyondu	1-(202)381-2663	0706 Heffernan Pass	Washington
6	6	Hansen	Lois	lhansen5@stumbleupon.com	Yozio	1-(315)385-6866	2 Ruskin Pass	Syracuse
7	6	Hansen	Lois	lhansen5@stumbleupon.com	Yozio	1-(315)385-6866	2 Ruskin Pass	Syracuse
8	7	Grant	Frances	fgrant6@yale.edu	Eire	1-(863)799-9068	61402 Morning Court	Lakeland
9	7	Grant	Frances	fgrant6@yale.edu	Eire	1-(863)799-9068	61402 Morning Court	Lakeland
10	8	Lewis	Catherine	clewis7@unesco.org	Realpoint	1-(915)208-4997	775 Messerschmidt Junction	El Paso
11	8	Lewis	Catherine	clewis7@unesco.org	Realpoint	1-(915)208-4997	775 Messerschmidt Junction	El Paso
12	9	Rogers	Edward	erogers8@guardian.co.uk	Quinu	1-(971)934-2404	7074 Montana Place	Portland
13	9	Rogers	Edward	erogers8@guardian.co.uk	Quinu	1-(971)934-2404	7074 Montana Place	Portland
14	10	Owens	Tina	towens9@earthlink.net	Blogtag	1-(712)989-9002	59039 Sachtjen Street	Sioux City
15	10	Owens	Tina	towens9@earthlink.net	Blogtag	1-(712)989-9002	59039 Sachtjen Street	Sioux City

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範例二

```sql
-- 找出重複
WITH DUPLICATE
AS
(
  SELECT id,
      ROW_NUMBER() OVER (PARTITION BY id ORDER BY last_name )
        AS seq
  FROM customers
)
-- DELETE FROM DUPLICATE WHERE seq > 1
SELECT * FROM DUPLICATE WHERE seq > 1
```

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範例三

```sql
WITH AllDays AS
(
        SELECT [Date] = DATEFROMPARTS( @Year, 1, 1 )
        UNION ALL
        SELECT [Date] = DATEADD( day, 1 , [Date] )
        FROM AllDays where [Date] < DATEFROMPARTS(@Year,12,31)
)
SELECT [Date],YEAR([Date]),MONTH([Date]),
        DATEPART(dy,[Date]),DATEPART( d,[Date]),
        DATEPART(dw,[Date]),DATEPART(wk,[Date])
        CASE DATEPART(dw, [Date])
                WHEN 6 THEN 0 -- Saturday
                WHEN 7 THEN 0 -- Sunday
                ELSE 1 -- Might lookup for a holidays table here
        END
FROM AllDays OPTION( MaxRecursion 10000 ) ;
```
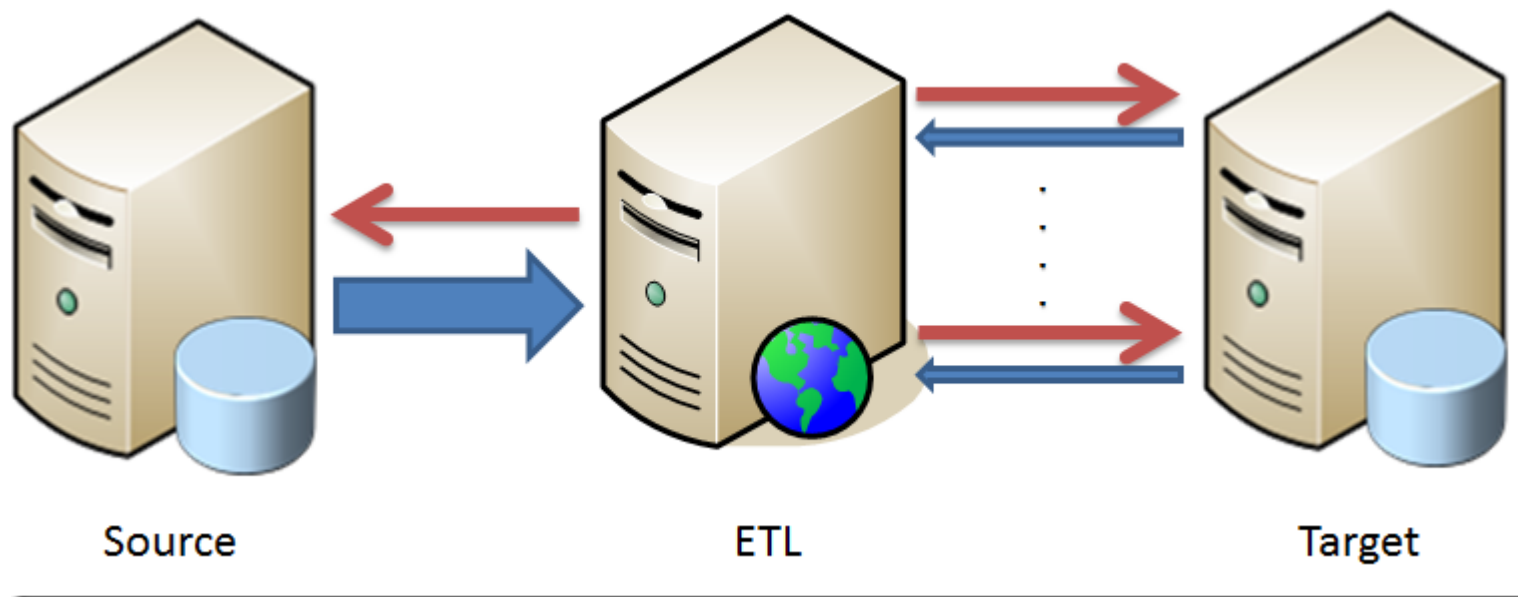
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MERGE

- SQL 2008 開始支援，ANSI SQL-2003 標準

Source　　　　　ETL　　　　　Target

怎麼寫出一個好的 SQL

MERGE 語法

```
[ WITH <common_table_expression> [,...n] ]
MERGE
    [ TOP ( expression ) [ PERCENT ] ]
    [ INTO ] <target_table> [ WITH ( <merge_hint> ) ] [ [ AS ] table_alias ]
    USING <table_source>
      ON <merge_search_condition>
    [ WHEN MATCHED [ AND <clause_search_condition> ]
        THEN <merge_matched> ] [ ...n ]
    [ WHEN NOT MATCHED [ BY TARGET ] [ AND <clause_search_condition> ]
        THEN <merge_not_matched> ]
    [ WHEN NOT MATCHED BY SOURCE [ AND <clause_search_condition> ]
        THEN <merge_matched> ] [ ...n ]
    [ <output_clause> ]
    [ OPTION ( <query_hint> [ ,...n ] ) ] ;
```

範例

```sql
-- 沒有則新增，有資料則更新
MERGE MonthlyIncome AS Target
USING
  (SELECT t1.ExceutY,t1.ExceutM,ISNULL(t3.xCost,0) Cost
   FROM @QCurrent t1
   LEFT JOIN t2 on t1.ExceutY=t2.ExceutY AND t1.ExceutM=t2.ExceutM
   LEFT JOIN t3 on t1.ExceutY=t3.ExceutY AND t1.ExceutM=t3.ExceutM
  ) AS Source
  ON Target.[Year]= Source.ExceutY and Target.[Month] = Source.ExceutM
  WHEN NOT MATCHED THEN
      INSERT ([Year],[Month],Cost) VAUES (Source.ExceutY,Source.ExceutM,Cost)
  WHEN MATCHED THEN
      UPDATE SET Cost=Source.Cost
```

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