

Tally Tables

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What?

- Table of Numbers

Why?

- Fill In Date or Time Series and Ranges
- Set-Based Text Manipulation
- “Explode” Data

How?

- Normal Table
- Derived Table
 - Brute Force
 - `SELECT 1 UNION ALL SELECT 2...`
 - Fancy Common-Table-Expressions
 - Itzik Ben-Gan
 - Erland Sommarskog
 - XML `.nodes()`
 - SQL Server 2016
 - `OPENJSON`
 - `Split_String`
- Built-in?
 - Nope. But there's a Connect Item for that.

<http://sqlmag.com/sql-server/virtual-auxiliary-table-numbers>

<https://connect.microsoft.com/SQLServer/Feedback/Details/258733>

<http://sommarskog.se/arrays-in-sql-2005.html#tblnum>

Recommended Architecture

- Inline Table-Valued User-Defined Function
- Itzik Ben-Gan Method
- Use TOP with Parameter

Itzik Ben-Gan

WITH

```
L0 AS(SELECT 1 AS c UNION ALL SELECT 1),  
L1 AS(SELECT 1 AS c FROM L0 AS A CROSS JOIN L0 AS B),  
L2 AS(SELECT 1 AS c FROM L1 AS A CROSS JOIN L1 AS B),  
L3 AS(SELECT 1 AS c FROM L2 AS A CROSS JOIN L2 AS B),  
L4 AS(SELECT 1 AS c FROM L3 AS A CROSS JOIN L3 AS B),  
L5 AS(SELECT 1 AS c FROM L4 AS A CROSS JOIN L4 AS B),  
Nums AS(SELECT ROW_NUMBER() OVER(ORDER BY  
(SELECT NULL)) AS n FROM L5)  
SELECT TOP (8000) n FROM Nums ORDER BY n;
```

Example - Exploding Rows

- CustomerName, Phone1, Phone2
- Method 1:
 - SELECT CustomerName, Phone1 AS Phone FROM Customers
 - UNION ALL
 - SELECT CustomerName, Phone2 AS Phone FROM Customers
- Method 2:
 - SELECT CustomerName,
 - CASE WHEN N = 1 THEN Phone1 ELSE Phone2 END
 - FROM Customers JOIN GetTallyTable(2)

Example - Dates

- DECLARE @StartDate date = getdate()-4;
- SELECT
- DATEADD(DAY,n-1,@StartDate) AS OrderDate,
- isNull(COUNT(OrderID),0) AS OrderCount
- FROM (SELECT 1 AS n UNION ALL SELECT 2 UNION ALL
 SELECT 3 UNION ALL SELECT 4) AS Numbers
- LEFT JOIN @Orders
- ON DATEADD(DAY,n-1,@StartDate) = OrderDate
- GROUP BY n
- ORDER BY n;