SQL Server Partition Function - SPLIT RANGE and MERGE RANGE Demo

```sql
-- 1. Create a Partition Function
CREATE PARTITION FUNCTION PF_TransactionDate (DATE)
AS RANGE LEFT FOR VALUES ('2024-01-31', '2024-02-29', '2024-03-31');

-- 2. Create Filegroups (Required for full example, optional for test)
-- Assuming primary for simplicity

-- 3. Create a Partition Scheme (just using PRIMARY for demo)
CREATE PARTITION SCHEME PS_TransactionDate
AS PARTITION PF_TransactionDate
ALL TO ([PRIMARY]);  -- In real use, assign different filegroups

-- 4. Create a Table Using the Partition Scheme
CREATE TABLE Sales (
    SaleID INT IDENTITY,
    TransactionDate DATE,
    Amount MONEY
)
ON PS_TransactionDate(TransactionDate);

-- 5. Insert Sample Data
INSERT INTO Sales (TransactionDate, Amount) VALUES
('2024-01-15', 1000),  -- Partition 1
('2024-02-10', 2000),  -- Partition 2
('2024-03-15', 3000),  -- Partition 3
('2024-04-01', 4000);  -- Goes into last partition (beyond '2024-03-31')

-- Check partition for each row
SELECT
    $PARTITION.PF_TransactionDate(TransactionDate) AS PartitionNumber,
    TransactionDate,
    Amount
FROM Sales;

-- 6. SPLIT RANGE - Add a Partition for April
ALTER PARTITION FUNCTION PF_TransactionDate()
SPLIT RANGE ('2024-04-30');

-- 7. MERGE RANGE - Remove '2024-02-29'
ALTER PARTITION FUNCTION PF_TransactionDate()
MERGE RANGE ('2024-02-29');

-- Cleanup Script (Optional)
DROP TABLE Sales;
DROP PARTITION SCHEME PS_TransactionDate;
DROP PARTITION FUNCTION PF_TransactionDate;
```