# SQL Server Indexing Exercises

## Step 1: Create Database

CREATE DATABASE IndexDemoDB;  
GO  
  
USE IndexDemoDB;  
GO

## Step 2: Create Tables

-- Customers Table  
CREATE TABLE Customers (  
 CustomerID INT PRIMARY KEY,  
 Name VARCHAR(100),  
 Region VARCHAR(50)  
);  
  
-- Products Table  
CREATE TABLE Products (  
 ProductID INT PRIMARY KEY,  
 ProductName VARCHAR(100),  
 Category VARCHAR(50),  
 Price DECIMAL(10, 2)  
);  
  
-- Orders Table  
CREATE TABLE Orders (  
 OrderID INT PRIMARY KEY,  
 CustomerID INT,  
 OrderDate DATE,  
 FOREIGN KEY (CustomerID) REFERENCES Customers(CustomerID)  
);  
  
-- OrderDetails Table  
CREATE TABLE OrderDetails (  
 OrderDetailID INT PRIMARY KEY,  
 OrderID INT,  
 ProductID INT,  
 Quantity INT,  
 FOREIGN KEY (OrderID) REFERENCES Orders(OrderID),  
 FOREIGN KEY (ProductID) REFERENCES Products(ProductID)  
);

## Step 3: Insert Sample Data

-- Customers  
INSERT INTO Customers (CustomerID, Name, Region) VALUES  
(1, 'Alice', 'North'),  
(2, 'Bob', 'South'),  
(3, 'Charlie', 'East'),  
(4, 'David', 'West');  
  
-- Products  
INSERT INTO Products (ProductID, ProductName, Category, Price) VALUES  
(1, 'Laptop', 'Electronics', 1200.00),  
(2, 'Smartphone', 'Electronics', 800.00),  
(3, 'Tablet', 'Electronics', 600.00),  
(4, 'Headphones', 'Accessories', 150.00);  
  
-- Orders  
INSERT INTO Orders (OrderID, CustomerID, OrderDate) VALUES  
(1, 1, '2023-01-15'),  
(2, 2, '2023-02-20'),  
(3, 3, '2023-03-25'),  
(4, 4, '2023-04-30');  
  
-- OrderDetails  
INSERT INTO OrderDetails (OrderDetailID, OrderID, ProductID, Quantity) VALUES  
(1, 1, 1, 1),  
(2, 2, 2, 2),  
(3, 3, 3, 1),  
(4, 4, 4, 3);

## Step 4: Enable Performance Stats (Optional)

SET STATISTICS IO ON;  
SET STATISTICS TIME ON;

## Exercise 1: Non-Clustered Index on ProductName

-- Before Index  
SELECT \* FROM Products WHERE ProductName = 'Laptop';  
  
-- Create Index (drop if exists)  
DROP INDEX IF EXISTS IX\_Products\_ProductName ON Products;  
CREATE NONCLUSTERED INDEX IX\_Products\_ProductName  
ON Products(ProductName);  
  
-- After Index  
SELECT \* FROM Products WHERE ProductName = 'Laptop';

## Exercise 2: Non-Clustered Index on OrderDate

-- Before Index  
SELECT \* FROM Orders WHERE OrderDate = '2023-01-15';  
  
-- Create Index (drop if exists)  
DROP INDEX IF EXISTS IX\_Orders\_OrderDate ON Orders;  
CREATE NONCLUSTERED INDEX IX\_Orders\_OrderDate  
ON Orders(OrderDate);  
  
-- After Index  
SELECT \* FROM Orders WHERE OrderDate = '2023-01-15';

## Exercise 3: Composite Index on CustomerID and OrderDate

-- Before Index  
SELECT \* FROM Orders WHERE CustomerID = 1 AND OrderDate = '2023-01-15';  
  
-- Create Composite Index (drop if exists)  
DROP INDEX IF EXISTS IX\_Orders\_CustomerID\_OrderDate ON Orders;  
CREATE NONCLUSTERED INDEX IX\_Orders\_CustomerID\_OrderDate  
ON Orders(CustomerID, OrderDate);  
  
-- After Index  
SELECT \* FROM Orders WHERE CustomerID = 1 AND OrderDate = '2023-01-15';



