Departmental Average Salary Analysis with Threshold

# 1. Project Overview

This project aims to analyze the average salary of employees across departments and identify those departments where the average salary exceeds the overall average salary of all employees. The implementation is done using SQL Server Management Studio (SSMS).

# 2. Database Design

The database consists of two tables:

* 1. Departments (DepartmentID, Name)
* 2. Employees (EmployeeID, Name, DepartmentID, Salary)

# 3. Table Schema

SQL script to create the required tables:

CREATE TABLE Departments (  
 DepartmentID INT PRIMARY KEY,  
 Name VARCHAR(100)  
);  
  
CREATE TABLE Employees (  
 EmployeeID INT PRIMARY KEY,  
 Name VARCHAR(100),  
 DepartmentID INT FOREIGN KEY REFERENCES Departments(DepartmentID),  
 Salary DECIMAL(10,2)  
);

# 4. Sample Data Insertion

Sample data used for testing the analysis:

INSERT INTO Departments VALUES   
(1, 'Marketing'),   
(2, 'Research'),   
(3, 'Development');  
  
INSERT INTO Employees VALUES  
(1, 'John Doe', 1, 60000.00),  
(2, 'Jane Smith', 1, 70000.00),  
(3, 'Alice Johnson', 1, 65000.00),  
(4, 'Bob Brown', 1, 75000.00),  
(5, 'Charlie Wilson', 1, 80000.00),  
(6, 'Eva Lee', 2, 70000.00),  
(7, 'Michael Clark', 2, 75000.00),  
(8, 'Sarah Davis', 2, 80000.00),  
(9, 'Ryan Harris', 2, 85000.00),  
(10, 'Emily White', 2, 90000.00),  
(11, 'David Martinez', 3, 95000.00),  
(12, 'Jessica Taylor', 3, 100000.00),  
(13, 'William Rodriguez', 3, 105000.00);

# 5. Analytical Query

The following query calculates department-wise average salary and filters only those departments where the average exceeds the overall average salary:

WITH OverallAvg AS (  
 SELECT AVG(Salary) AS OverallAverage FROM Employees  
),  
DeptStats AS (  
 SELECT   
 e.DepartmentID,  
 d.Name AS DepartmentName,  
 AVG(e.Salary) AS AverageSalary,  
 COUNT(\*) AS NumberOfEmployees  
 FROM Employees e  
 JOIN Departments d ON e.DepartmentID = d.DepartmentID  
 GROUP BY e.DepartmentID, d.Name  
)  
SELECT   
 DepartmentName,  
 AverageSalary,  
 NumberOfEmployees  
FROM DeptStats  
CROSS JOIN OverallAvg  
WHERE AverageSalary > OverallAverage;

# 6. Expected Output

Based on the sample data, the output is:

DepartmentName | AverageSalary | NumberOfEmployees  
---------------------------------------------------------  
Development | 100000.000000 | 3