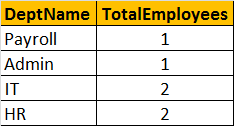
**Common table expression (CTE)** is introduced in SQL server 2005. A **CTE** is a temporary result set, that can be referenced within a SELECT, INSERT, UPDATE, or DELETE statement, that immediately follows the **CTE.**   
  
   
  
   
  
   
  
Let's create the required Employee and Department tables, that we will be using for this demo.   
  
**SQL Script to create tblEmployee table:**  
CREATE TABLE tblEmployee  
(  
  Id int Primary Key,  
  Name nvarchar(30),  
  Gender nvarchar(10),  
  DepartmentId int  
)  
  
**SQL Script to create tblDepartment table**  
CREATE TABLE tblDepartment  
(  
 DeptId int Primary Key,  
 DeptName nvarchar(20)  
)  
  
**Insert data into tblDepartment table**  
Insert into tblDepartment values (1,'IT')  
Insert into tblDepartment values (2,'Payroll')  
Insert into tblDepartment values (3,'HR')  
Insert into tblDepartment values (4,'Admin')  
  
**Insert data into tblEmployee table**  
Insert into tblEmployee values (1,'John', 'Male', 3)  
Insert into tblEmployee values (2,'Mike', 'Male', 2)  
Insert into tblEmployee values (3,'Pam', 'Female', 1)  
Insert into tblEmployee values (4,'Todd', 'Male', 4)  
Insert into tblEmployee values (5,'Sara', 'Female', 1)  
Insert into tblEmployee values (6,'Ben', 'Male', 3)   
  
**Write a query using CTE,**to display the total number of Employees by Department Name. The output should be as shown below.   


**Before we write the query, let's look at the syntax for creating a CTE.**  
**WITH cte\_name (Column1, Column2, ..)**  
**AS**  
**( CTE\_query )**  
  
**SQL query using CTE:**  
With EmployeeCount(DepartmentId, TotalEmployees)  
as  
(  
 Select DepartmentId, COUNT(\*) as TotalEmployees  
 from tblEmployee  
 group by DepartmentId  
)  
  
Select DeptName, TotalEmployees  
from tblDepartment  
join EmployeeCount  
on tblDepartment.DeptId = EmployeeCount.DepartmentId  
order by TotalEmployees  
  
**We define a CTE**, using **WITH** keyword, followed by the name of the CTE. In our example, **EmployeeCount**is the name of the CTE. Within parentheses, we specify the columns that make up the CTE. **DepartmentId** and **TotalEmployees** are the columns of **EmployeeCount** CTE. These 2 columns map to the columns returned by the **SELECT CTE query**. The CTE column names and CTE query column names can be different. Infact, CTE column names are optional. However, if you do specify, the number of **CTE columns** and the **CTE SELECT query** columns should be same. Otherwise you will get an error stating - 'EmployeeCount has fewer columns than were specified in the column list'. The column list, is followed by the as keyword, following which we have the CTE query within a pair of parentheses.  
  
**EmployeeCount CTE** is being joined with **tblDepartment** table, in the SELECT query, that immediately follows the CTE. Remember, a CTE can only be referenced by a SELECT, INSERT, UPDATE, or DELETE statement, **that immediately follows the CTE**. If you try to do something else in between, we get an error stating - 'Common table expression defined but not used'. The following SQL, raise an error.  
  
With EmployeeCount(DepartmentId, TotalEmployees)  
as  
(  
 Select DepartmentId, COUNT(\*) as TotalEmployees  
 from tblEmployee  
 group by DepartmentId  
)  
  
Select 'Hello'  
  
Select DeptName, TotalEmployees  
from tblDepartment  
join EmployeeCount  
on tblDepartment.DeptId = EmployeeCount.DepartmentId  
order by TotalEmployees  
  
**It is also, possible to create multiple CTE's using a single WITH clause.**  
With EmployeesCountBy\_Payroll\_IT\_Dept(DepartmentName, Total)  
as  
(  
 Select DeptName, COUNT(Id) as TotalEmployees  
 from tblEmployee  
 join tblDepartment   
 on tblEmployee.DepartmentId = tblDepartment.DeptId  
 where DeptName IN ('Payroll','IT')  
 group by DeptName  
),  
EmployeesCountBy\_HR\_Admin\_Dept(DepartmentName, Total)  
as  
(  
 Select DeptName, COUNT(Id) as TotalEmployees  
 from tblEmployee  
 join tblDepartment   
 on tblEmployee.DepartmentId = tblDepartment.DeptId  
 group by DeptName   
)  
Select \* from EmployeesCountBy\_HR\_Admin\_Dept   
UNION  
Select \* from EmployeesCountBy\_Payroll\_IT\_Dept