УО «Белорусский государственный университет информатики и радиоэлектроники»

Кафедра ПОИТ

Отчет по лабораторной работе № 5

по предмету

«Базы данных»

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Вариант 2

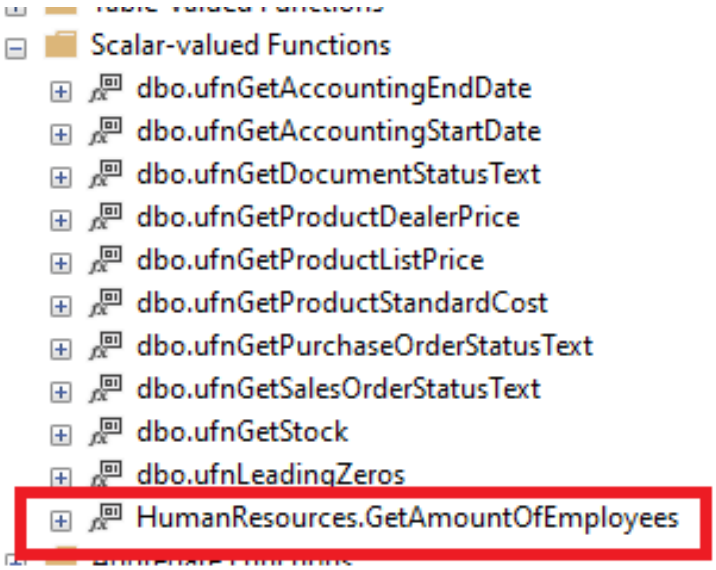
Пользовательские функции: scalar-valued, inline table-valued, multistatement table-valued. Операторы CROSS APPLY и OUTER APPLY.

Создайте scalar-valued функцию, которая будет принимать в качестве входного параметра id отдела (HumanResources.Department.DepartmentID) и возвращать количество сотрудников, работающих в отделе.

SQL запрос:

```sql
-- Создайте scalar-valued функцию, которая будет принимать в качестве входного параметра id отдела
-- (HumanResources.Department.DepartmentID) и возвращать количество сотрудников, работающих в отделе.

CREATE FUNCTION HumanResources.GetAmountOfEmployees(@departmentID SMALLINT)
RETURNS SMALLINT AS
BEGIN
    DECLARE @employeesAmount INT

    SELECT @employeesAmount = COUNT(BusinessEntityID)
    FROM HumanResources.EmployeeDepartmentHistory AS EmlDepHis
    WHERE EmlDepHis.DepartmentID = @departmentID
        AND EmlDepHis.EndDate IS NULL;

    RETURN @employeesAmount;
END
GO

SELECT * FROM HumanResources.EmployeeDepartmentHistory
    ORDER BY DepartmentID;

PRINT(HumanResources.GetAmountOfEmployees(1));
GO
```

Результат выполнения запроса:



	BusinessEntityID	DepartmentID	ShiftID	StartDate	EndDate	ModifiedDate
1	2	1	1	2002-03-03	NULL	2002-03-02 00:00:00.000
2	3	1	1	2001-12-12	NULL	2001-12-11 00:00:00.000
3	4	1	1	2002-01-05	2004-06-30	2004-06-28 00:00:00.000
4	5	1	1	2002-02-06	NULL	2002-02-05 00:00:00.000
5	6	1	1	2002-02-24	NULL	2002-02-23 00:00:00.000
6	14	1	1	2005-01-30	NULL	2005-01-29 00:00:00.000
7	15	1	1	2005-02-18	NULL	2005-02-17 00:00:00.000
8	11	2	1	2005-01-05	NULL	2005-01-04 00:00:00.000

Messages

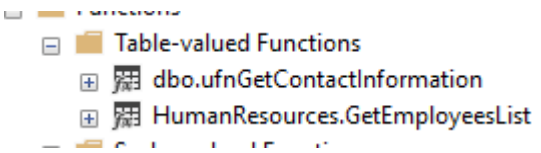
```
6

Completion time: 2020-09-19T20:19:06.9747273+03:00
```

Создайте inline table-valued функцию, которая будет принимать в качестве входного параметра id отдела (HumanResources.Department.DepartmentID), а возвращать сотрудников, которые работают в отделе более 11 лет.

SQL запрос:

```sql
-- Создайте inline table-valued функцию, которая будет принимать в качестве входного параметра id отдела
-- (HumanResources.Department.DepartmentID), а возвращать сотрудников, которые работают в отделе более 11 лет.

CREATE FUNCTION HumanResources.GetEmployeesList(@departmentID SMALLINT)
RETURNS TABLE AS

RETURN
    SELECT * FROM HumanResources.EmployeeDepartmentHistory AS EmlDepHis
    WHERE EmlDepHis.DepartmentID = @departmentID
        AND DATEDIFF(YEAR, StartDate, GETDATE()) > 11
        AND EmlDepHis.EndDate IS NULL;
GO

SELECT * FROM HumanResources.EmployeeDepartmentHistory AS EmlDepHis
    WHERE EmlDepHis.DepartmentID = 1
        AND DATEDIFF(YEAR, StartDate, GETDATE()) > 11
        AND EmlDepHis.EndDate IS NULL;
GO

SELECT * FROM HumanResources.GetEmployeesList(1);
GO
```

Результат выполнения запроса:



Results Messages

	BusinessEntityID	DepartmentID	ShiftID	StartDate	EndDate	ModifiedDate
1	2	1	1	2002-03-03	NULL	2002-03-02 00:00:00.000
2	3	1	1	2001-12-12	NULL	2001-12-11 00:00:00.000
3	5	1	1	2002-02-06	NULL	2002-02-05 00:00:00.000
4	6	1	1	2002-02-24	NULL	2002-02-23 00:00:00.000
5	14	1	1	2005-01-30	NULL	2005-01-29 00:00:00.000
6	15	1	1	2005-02-18	NULL	2005-02-17 00:00:00.000

Вызовите функцию для каждого отдела, применив оператор CROSS APPLY.

SQL запрос:

```
-- Вызовите функцию для каждого отдела, применив оператор CROSS APPLY.

SELECT BusinessEntityID,
    ShiftID,
    StartDate,
    Dep.DepartmentID,
    Dep.Name AS DepartmentName,
    Dep.GroupName,
    Dep.ModifiedDate
FROM HumanResources.Department AS Dep
    CROSS APPLY HumanResources.GetEmployeesList(Dep.DepartmentID)
ORDER BY Dep.DepartmentID;
GO
```

Результат выполнения запроса:

Results | Messages

	BusinessEntityID	ShiftID	StartDate	DepartmentID	DepartmentName	GroupName	ModifiedDate
1	5	1	2002-02-06	1	Engineering	Research and Development	2002-06-01 00:00:00.000
2	6	1	2002-02-24	1	Engineering	Research and Development	2002-06-01 00:00:00.000
3	2	1	2002-03-03	1	Engineering	Research and Development	2002-06-01 00:00:00.000
4	3	1	2001-12-12	1	Engineering	Research and Development	2002-06-01 00:00:00.000
5	14	1	2005-01-30	1	Engineering	Research and Development	2002-06-01 00:00:00.000
6	15	1	2005-02-18	1	Engineering	Research and Development	2002-06-01 00:00:00.000
7	4	1	2004-07-01	2	Tool Design	Research and Development	2002-06-01 00:00:00.000
8	11	1	2005-01-05	2	Tool Design	Research and Development	2002-06-01 00:00:00.000
9	12	1	2002-01-11	2	Tool Design	Research and Development	2002-06-01 00:00:00.000
10	13	1	2005-01-23	2	Tool Design	Research and Development	2002-06-01 00:00:00.000
11	273	1	2005-03-18	3	Sales	Sales and Marketing	2002-06-01 00:00:00.000
12	274	1	2005-03-04	3	Sales	Sales and Marketing	2002-06-01 00:00:00.000

Вызовите функцию для каждого отдела, применив оператор OUTER APPLY.

SQL запрос:

```
-- Вызовите функцию для каждого отдела, применив оператор OUTER APPLY.

SELECT BusinessEntityID,
    ShiftID,
    StartDate,
    Dep.DepartmentID,
    Dep.Name AS DepartmentName,
    Dep.GroupName,
    Dep.ModifiedDate
FROM HumanResources.Department AS Dep
    OUTER APPLY HumanResources.GetEmployeesList(Dep.DepartmentID)
ORDER BY Dep.DepartmentID;
GO
```

Результат выполнения запроса:

Results | Messages

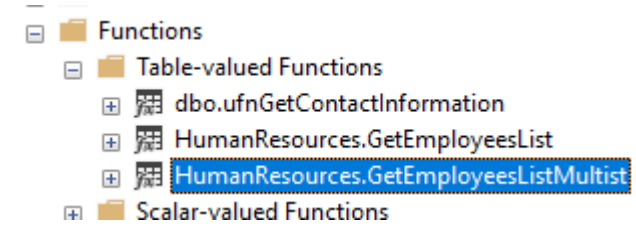
	BusinessEntityID	ShiftID	StartDate	DepartmentID	DepartmentName	GroupName	ModifiedDate
1	2	1	2002-03-03	1	Engineering	Research and Development	2002-06-01 00:00:00.000
2	3	1	2001-12-12	1	Engineering	Research and Development	2002-06-01 00:00:00.000
3	5	1	2002-02-06	1	Engineering	Research and Development	2002-06-01 00:00:00.000
4	6	1	2002-02-24	1	Engineering	Research and Development	2002-06-01 00:00:00.000
5	14	1	2005-01-30	1	Engineering	Research and Development	2002-06-01 00:00:00.000
6	15	1	2005-02-18	1	Engineering	Research and Development	2002-06-01 00:00:00.000
7	4	1	2004-07-01	2	Tool Design	Research and Development	2002-06-01 00:00:00.000
8	11	1	2005-01-05	2	Tool Design	Research and Development	2002-06-01 00:00:00.000
9	12	1	2002-01-11	2	Tool Design	Research and Development	2002-06-01 00:00:00.000
10	13	1	2005-01-23	2	Tool Design	Research and Development	2002-06-01 00:00:00.000
11	273	1	2005-03-18	3	Sales	Sales and Marketing	2002-06-01 00:00:00.000
12	274	1	2005-02-04	3	Sales	Sales and Marketing	2002-06-01 00:00:00.000

Измените созданную inline table-valued функцию, сделав ее multistatement table-valued (предварительно сохранив для проверки код создания inline table-valued функции).

SQL запрос:

```sql
-- Измените созданную inline table-valued функцию, сделав ее multistatement table-valued
-- (предварительно сохранив для проверки код создания inline table-valued функции).

CREATE FUNCTION HumanResources.GetEmployeesListMultist(@departmentID SMALLINT)
RETURNS @table TABLE (
    BusinessEntityID INT,
    DepartmentID SMALLINT,
    ShiftID TINYINT,
    StartDate DATE,
    EndDate DATE,
    ModifiedDate DATETIME
)
AS
BEGIN
    INSERT INTO @table
    SELECT
        BusinessEntityID,
        DepartmentID,
        ShiftID,
        StartDate,
        EndDate,
        ModifiedDate
    FROM HumanResources.EmployeeDepartmentHistory
    WHERE DepartmentID = @departmentID
        AND DATEDIFF(YEAR, StartDate, GETDATE()) > 11
        AND EndDate IS NULL;

    RETURN
END
GO

SELECT * FROM HumanResources.GetEmployeesListMultist(1);
GO
```

Результат выполнения запроса:



Results | Messages

	BusinessEntityID	DepartmentID	ShiftID	StartDate	EndDate	ModifiedDate
1	2	1	1	2002-03-03	NULL	2002-03-02 00:00:00.000
2	3	1	1	2001-12-12	NULL	2001-12-11 00:00:00.000
3	5	1	1	2002-02-06	NULL	2002-02-05 00:00:00.000
4	6	1	1	2002-02-24	NULL	2002-02-23 00:00:00.000
5	14	1	1	2005-01-30	NULL	2005-01-29 00:00:00.000
6	15	1	1	2005-02-18	NULL	2005-02-17 00:00:00.000