

Лабораторная работа 5

Задание 1

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

The screenshot shows the SQL Query window in SQL Server Enterprise Manager. The title bar indicates the file is 'SQLQuery1.sql' and the server is 'DE...MDJ6\Kseniya (53)'. The query text is as follows:

```
CREATE FUNCTION [HumanResources].[ufn_GetDepartmentEmployeeCount](@DepartmentID smallint)
RETURNS int
AS
BEGIN
    DECLARE @ret int;
    SELECT @ret = COUNT(*)
    FROM [HumanResources].[EmployeeDepartmentHistory] edh
    WHERE edh.[DepartmentID] = @DepartmentID AND [EndDate] IS NULL
    RETURN @ret;
END;
```

Below the query window, the 'Messages' pane shows the execution results:

Сообщения

Выполнение команд успешно завершено.

Время выполнения: 2020-11-10T18:00:51.9116664+03:00

- AdventureWorks2012
 - Диаграммы баз данных
 - Таблицы
 - Представления
 - Внешние ресурсы
 - Синонимы
 - Программирование
 - Хранимые процедуры
 - Функции
 - Функции, возвращающие табличное значение
 - Скалярные функции
 - dbo.ufnGetAccountingEndDate
 - dbo.ufnGetAccountingStartDate
 - dbo.ufnGetDocumentStatusText
 - dbo.ufnGetProductDealerPrice
 - dbo.ufnGetProductListPrice
 - dbo.ufnGetProductStandardCost
 - dbo.ufnGetPurchaseOrderStatusText
 - dbo.ufnGetSalesOrderStatusText
 - dbo.ufnGetStock
 - dbo.ufnLeadingZeros
 - HumanResources.ufn_GetDepartmentEmployeeCount

```
PRINT [HumanResources].[ufn_GetDepartmentEmployeeCount](10);
GO
```

100 %

Сообщения

10

Время выполнения: 2020-11-10T18:08:21.6214145+03:00

```
SELECT * FROM [HumanResources].[EmployeeDepartmentHistory] edh
WHERE edh.[DepartmentID] = 10 AND edh.[EndDate] IS NULL;
GO
```

100 %

Результаты Сообщения

	BusinessEntityID	DepartmentID	ShiftID	StartDate	EndDate	ModifiedDate
1	241	10	1	2003-03-03	NULL	2003-03-02 00:00:00.000
2	242	10	1	2003-01-19	NULL	2003-01-18 00:00:00.000
3	243	10	1	2003-02-07	NULL	2003-02-06 00:00:00.000
4	244	10	1	2003-02-25	NULL	2003-02-24 00:00:00.000
5	245	10	1	2003-03-22	NULL	2003-03-21 00:00:00.000
6	246	10	1	2003-03-15	NULL	2003-03-14 00:00:00.000
7	247	10	1	2003-04-02	NULL	2003-04-01 00:00:00.000
8	248	10	1	2003-04-09	NULL	2003-04-08 00:00:00.000
9	249	10	1	2003-01-26	NULL	2003-01-25 00:00:00.000
10	262	10	1	2003-02-13	NULL	2003-02-12 00:00:00.000

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.

```
SQLQuery1.sql - DE...MDJ6\Kseniya (53)*
CREATE FUNCTION [HumanResources].[ufnGetMoreElevenYearsInDepartmentEmployees] (@DepartmentID smallint)
RETURNS TABLE
AS
RETURN (
    SELECT * FROM [HumanResources].[EmployeeDepartmentHistory]
    WHERE
        [DepartmentID] = @DepartmentID
        AND DATEDIFF(YEAR, [StartDate], GETDATE()) > 11
        AND [EndDate] IS NULL
);
GO
```

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Сообщения

Выполнение команд успешно завершено.

Время выполнения: 2020-11-10T18:23:15.5304282+03:00

- AdventureWorks2012
 - Диаграммы баз данных
 - Таблицы
 - Представления
 - Внешние ресурсы
 - Синонимы
 - Программирование
 - Хранимые процедуры
 - Функции
 - Функции, возвращающие табличное значение
 - dbo.ufnGetContactInformation
 - HumanResources.ufnGetMoreElevenYearsInDepartmentEmployees

Solution1

SQLQuery1.sql - DE...MDJ6\Kseniya (53))*

```

SELECT * FROM [HumanResources].[ufnGetMoreElevenYearsInDepartmentEmployees](10);
GO
SELECT * FROM [HumanResources].[EmployeeDepartmentHistory]
WHERE
    [DepartmentID] = 10
    AND DATEDIFF(YEAR, [StartDate], GETDATE()) > 11
    AND [EndDate] IS NULL;
GO
  
```

100 %

Результаты Сообщения

	BusinessEntityID	DepartmentID	ShiftID	StartDate	EndDate	ModifiedDate
1	241	10	1	2003-03-03	NULL	2003-03-02 00:00:00.000
2	242	10	1	2003-01-19	NULL	2003-01-18 00:00:00.000
3	243	10	1	2003-02-07	NULL	2003-02-06 00:00:00.000
4	244	10	1	2003-02-25	NULL	2003-02-24 00:00:00.000
5	245	10	1	2003-03-22	NULL	2003-03-21 00:00:00.000
6	246	10	1	2003-03-15	NULL	2003-03-14 00:00:00.000
7	247	10	1	2003-04-02	NULL	2003-04-01 00:00:00.000
8	248	10	1	2003-04-09	NULL	2003-04-08 00:00:00.000
9	249	10	1	2003-01-26	NULL	2003-01-25 00:00:00.000
10	262	10	1	2003-02-13	NULL	2003-02-12 00:00:00.000

	Busines...	DepartmentID	ShiftID	StartDate	EndDate	ModifiedDate
3	243	10	1	2003-02-07	NULL	2003-02-06 00:00:00.000
4	244	10	1	2003-02-25	NULL	2003-02-24 00:00:00.000
5	245	10	1	2003-03-22	NULL	2003-03-21 00:00:00.000
6	246	10	1	2003-03-15	NULL	2003-03-14 00:00:00.000
7	247	10	1	2003-04-02	NULL	2003-04-01 00:00:00.000
8	248	10	1	2003-04-09	NULL	2003-04-08 00:00:00.000
9	249	10	1	2003-01-26	NULL	2003-01-25 00:00:00.000
10	262	10	1	2003-02-13	NULL	2003-02-12 00:00:00.000

Вызовите функцию для каждого отдела, применив оператор CROSS APPLY. Вызовите функцию для каждого отдела, применив оператор OUTER APPLY.

V2.sql - DESKTOP-I...MDJ6\Kseniya (52)

```

SELECT
    d.[DepartmentID],
    [BusinessEntityID],
    [Name],
    [GroupName],
    [ShiftID],
    [StartDate],
    [EndDate],
    d.[ModifiedDate]
FROM [HumanResources].[Department] d
CROSS APPLY [HumanResources].[ufnGetMoreElevenYearsInDepartmentEmployees](d.[DepartmentID])
ORDER BY d.[DepartmentID];

```

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Результаты Сообщения

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

Запрос успешно выполнен. DESKTOP-IHCMDJ6 (14.0 RTM) DESKTOP-IHCMDJ6\Kseniy... AdventureWorks2012 00:00:00 290 строки

V2.sql - DESKTOP-I...MDJ6\Kseniya (52)*

```

SELECT
    d.[DepartmentID],
    [BusinessEntityID],
    [Name],
    [GroupName],
    [ShiftID],
    [StartDate],
    [EndDate],
    d.[ModifiedDate]
FROM [HumanResources].[Department] AS d
OUTER APPLY [HumanResources].[ufnGetMoreElevenYearsInDepartmentEmployees](d.DepartmentID)
ORDER BY d.[DepartmentID];
GO

```

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Результаты Сообщения

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

Запрос успешно выполнен. DESKTOP-IHCMDJ6 (14.0 RTM) DESKTOP-IHCMDJ6\Kseniy... AdventureWorks2012 00:00:00 290 строки

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

```
V2.sql - DESKTOP-I...MDJ6\Kseniya (52))* X
CREATE FUNCTION [HumanResources].[ufnGetMoreElevenYearsInDepartmentEmployees] (@DepartmentID smallint)
RETURNS @e TABLE (
    [DepartmentID] SMALLINT NOT NULL,
    [BusinessEntityID] INT NOT NULL,
    [ShiftID] TINYINT NOT NULL,
    [StartDate] DATE NOT NULL,
    [EndDate] DATE NULL,
    [ModifiedDate] DATETIME NOT NULL
) AS
BEGIN
    INSERT INTO @e
    SELECT * FROM [HumanResources].[EmployeeDepartmentHistory]
    WHERE
        [DepartmentID] = @DepartmentID
        AND DATEDIFF(YEAR, [StartDate], GETDATE()) > 11
        AND [EndDate] IS NULL
    RETURN;
END;
```

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Сообщения

Выполнение команд успешно завершено.

Время выполнения: 2020-11-14T20:29:26.7857267+03:00

----- проверка -----

```
SELECT * FROM [HumanResources].[ufnGetMoreElevenYearsInDepartmentEmployees] (10)
GO
```

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Результаты Сообщения

	DepartmentID	BusinessEntityID	ShiftID	StartDate	EndDate	ModifiedDate
1	241	10	1	2003-03-03	NULL	2003-03-02 00:00:00.000
2	242	10	1	2003-01-19	NULL	2003-01-18 00:00:00.000
3	243	10	1	2003-02-07	NULL	2003-02-06 00:00:00.000
4	244	10	1	2003-02-25	NULL	2003-02-24 00:00:00.000
5	245	10	1	2003-03-22	NULL	2003-03-21 00:00:00.000
6	246	10	1	2003-03-15	NULL	2003-03-14 00:00:00.000
7	247	10	1	2003-04-02	NULL	2003-04-01 00:00:00.000
8	248	10	1	2003-04-09	NULL	2003-04-08 00:00:00.000
9	249	10	1	2003-01-26	NULL	2003-01-25 00:00:00.000
10	262	10	1	2003-02-13	NULL	2003-02-12 00:00:00.000

Запрос успешно выполнен. DESKTOP-IHCMDJ6 (14.0 RTM) DESKTOP-IHCMDJ6\Kseniy... AdventureWorks2012 00:00:00 10 строки