ОТЧЕТ
по лабораторной работе № 5
Вариант 1

Выполнила
Студентка гр. 751002                                        Л.А. Поболь


Проверил                                                         О.А. Салей

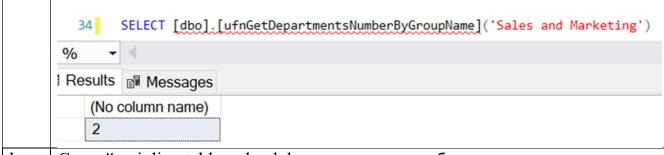# Выполнение лабораторной работы

## Задание 1

| | |
|---|---|
| a | Создайте scalar-valued функцию, которая будет принимать в качестве входного параметра имя группы отделов (HumanResources.Department.GroupName) и возвращать количество отделов, входящих в эту группу. |

```sql
3  -- =============================================
4  -- Author:      Larisa Pobol
5  -- Create date: 11/6/2020
6  -- Description: returns number of departments included in group with name @groupName
7  -- =============================================
8  CREATE FUNCTION [dbo].[ufnGetDepartmentsNumberByGroupname]
9  (
10     @GroupName      nvarchar(50)
11 )
12 RETURNS int
13 AS
14 BEGIN
15     DECLARE @ret    int;
16
17     SELECT  @ret = COUNT([DepartmentID]) FROM [HumanResources].[Department]
18                         WHERE [Department].[GroupName] = @GroupName;
19
20     RETURN @ret;
21
22 END
```

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🔲 Messages

```
Commands completed successfully.

Completion time: 2020-11-06T12:37:11.4695488+03:00
```

- AdventureWorks2012
  - Database Diagrams
  - Tables
  - Views
  - External Resources
  - Synonyms
  - Programmability
    - Stored Procedures
    - Functions
      - Table-valued Functions
      - Scalar-valued Functions
        - dbo.ufnGetAccountingEndDate
        - dbo.ufnGetAccountingStartDate
        - dbo.ufnGetDepartmentsNumber
        - dbo.ufnGetDepartmentsNumberByGroupName
          - Parameters
            - @GroupName (nvarchar(50), No default)
        - dbo.ufnGetDocumentStatusText

```
34    SELECT [dbo].[ufnGetDepartmentsNumberByGroupName]('Sales and Marketing')
```

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Results  Messages

| (No column name) |
| --- |
| 2 |

| b | Создайте inline table-valued функцию, которая будет принимать в качестве входного параметра id отдела (HumanResources.Department.DepartmentID), а возвращать 3 самых старших сотрудника, которые начали работать в отделе с 2005 года. |
| --- | --- |

```
 8  -- ===============================================
 9  -- Author:      Larisa Pobol
10  -- Create date: 11/6/2020
11  -- Description: returns three oldest employees who have started working in the department since 2005
12  -- ===============================================
13  CREATE FUNCTION [dbo].[ufnGetThreeOldestEmployee]
14  (
15      @DepartmentID    int
16  )
17  RETURNS TABLE
18  AS
19  RETURN
20  (
21      SELECT TOP(3) [employee].* FROM [HumanResources].[Employee] [employee]
22      INNER JOIN [HumanResources].[EmployeeDepartmentHistory] [history]
23          ON [employee].[BusinessEntityID]  = [history].[BusinessEntityID]
24      WHERE   [history].[DepartmentID]       = @DepartmentID
25          AND [history].[StartDate]  BETWEEN '2005' and '2006'
26          AND [history].[EndDate] IS NULL
27      ORDER BY [employee].[BirthDate] ASC
28  )
```

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Messages

```
Commands completed successfully.

Completion time: 2020-11-06T14:00:35.3978302+03:00
```
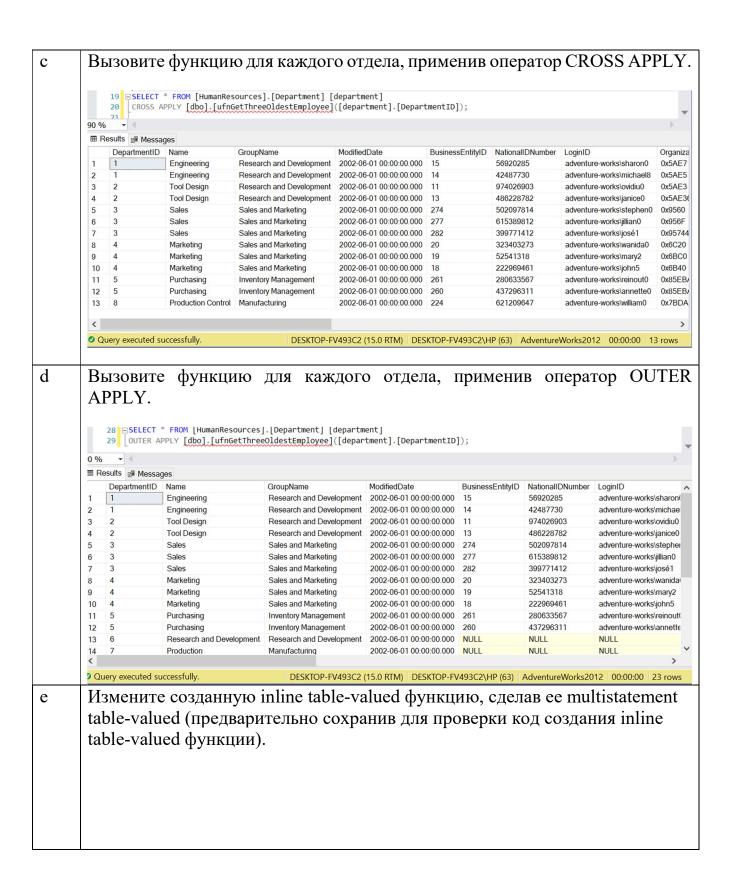
- AdventureWorks2012
  - Database Diagrams
  - Tables
  - Views
  - External Resources
  - Synonyms
  - Programmability
    - Stored Procedures
    - Functions
      - Table-valued Functions
        - dbo.ufnGetContactInformation
          - Parameters
        - dbo.ufnGetThreeOldestEmployee
          - Parameters
            - @DepartmentID (int, No default)

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

```sql
19  SELECT * FROM [HumanResources].[Department] [department]
20  CROSS APPLY [dbo].[ufnGetThreeOldestEmployee]([department].[DepartmentID]);
21
```

90 %

Results | Messages

| | DepartmentID | Name | GroupName | ModifiedDate | BusinessEntityID | NationalIDNumber | LoginID | Organiza |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | Engineering | Research and Development | 2002-06-01 00:00:00.000 | 15 | 56920285 | adventure-works\sharon0 | 0x5AE7 |
| 2 | 1 | Engineering | Research and Development | 2002-06-01 00:00:00.000 | 14 | 42487730 | adventure-works\michael8 | 0x5AE5 |
| 3 | 2 | Tool Design | Research and Development | 2002-06-01 00:00:00.000 | 11 | 974026903 | adventure-works\ovidiu0 | 0x5AE3 |
| 4 | 2 | Tool Design | Research and Development | 2002-06-01 00:00:00.000 | 13 | 486228782 | adventure-works\janice0 | 0x5AE3€ |
| 5 | 3 | Sales | Sales and Marketing | 2002-06-01 00:00:00.000 | 274 | 502097814 | adventure-works\stephen0 | 0x9560 |
| 6 | 3 | Sales | Sales and Marketing | 2002-06-01 00:00:00.000 | 277 | 615389812 | adventure-works\jillian0 | 0x956F |
| 7 | 3 | Sales | Sales and Marketing | 2002-06-01 00:00:00.000 | 282 | 399771412 | adventure-works\josé1 | 0x95744 |
| 8 | 4 | Marketing | Sales and Marketing | 2002-06-01 00:00:00.000 | 20 | 323403273 | adventure-works\wanida0 | 0x6C20 |
| 9 | 4 | Marketing | Sales and Marketing | 2002-06-01 00:00:00.000 | 19 | 52541318 | adventure-works\mary2 | 0x6BC0 |
| 10 | 4 | Marketing | Sales and Marketing | 2002-06-01 00:00:00.000 | 18 | 222969461 | adventure-works\john5 | 0x6B40 |
| 11 | 5 | Purchasing | Inventory Management | 2002-06-01 00:00:00.000 | 261 | 280633567 | adventure-works\reinout0 | 0x85EB/ |
| 12 | 5 | Purchasing | Inventory Management | 2002-06-01 00:00:00.000 | 260 | 437296311 | adventure-works\annette0 | 0x85EB/ |
| 13 | 8 | Production Control | Manufacturing | 2002-06-01 00:00:00.000 | 224 | 621209647 | adventure-works\william0 | 0x7BDA |

Query executed successfully. | DESKTOP-FV493C2 (15.0 RTM) | DESKTOP-FV493C2\HP (63) | AdventureWorks2012 | 00:00:00 | 13 rows

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

```sql
28  SELECT * FROM [HumanResources].[Department] [department]
29  OUTER APPLY [dbo].[ufnGetThreeOldestEmployee]([department].[DepartmentID]);
```

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Results | Messages

| | DepartmentID | Name | GroupName | ModifiedDate | BusinessEntityID | NationalIDNumber | LoginID |
|---|---|---|---|---|---|---|---|
| 1 | 1 | Engineering | Research and Development | 2002-06-01 00:00:00.000 | 15 | 56920285 | adventure-works\sharon0 |
| 2 | 1 | Engineering | Research and Development | 2002-06-01 00:00:00.000 | 14 | 42487730 | adventure-works\michae |
| 3 | 2 | Tool Design | Research and Development | 2002-06-01 00:00:00.000 | 11 | 974026903 | adventure-works\ovidiu0 |
| 4 | 2 | Tool Design | Research and Development | 2002-06-01 00:00:00.000 | 13 | 486228782 | adventure-works\janice0 |
| 5 | 3 | Sales | Sales and Marketing | 2002-06-01 00:00:00.000 | 274 | 502097814 | adventure-works\stepher |
| 6 | 3 | Sales | Sales and Marketing | 2002-06-01 00:00:00.000 | 277 | 615389812 | adventure-works\jillian0 |
| 7 | 3 | Sales | Sales and Marketing | 2002-06-01 00:00:00.000 | 282 | 399771412 | adventure-works\josé1 |
| 8 | 4 | Marketing | Sales and Marketing | 2002-06-01 00:00:00.000 | 20 | 323403273 | adventure-works\wanida |
| 9 | 4 | Marketing | Sales and Marketing | 2002-06-01 00:00:00.000 | 19 | 52541318 | adventure-works\mary2 |
| 10 | 4 | Marketing | Sales and Marketing | 2002-06-01 00:00:00.000 | 18 | 222969461 | adventure-works\john5 |
| 11 | 5 | Purchasing | Inventory Management | 2002-06-01 00:00:00.000 | 261 | 280633567 | adventure-works\reinout0 |
| 12 | 5 | Purchasing | Inventory Management | 2002-06-01 00:00:00.000 | 260 | 437296311 | adventure-works\annette |
| 13 | 6 | Research and Development | Research and Development | 2002-06-01 00:00:00.000 | NULL | NULL | NULL |
| 14 | 7 | Production | Manufacturing | 2002-06-01 00:00:00.000 | NULL | NULL | NULL |

Query executed successfully. | DESKTOP-FV493C2 (15.0 RTM) | DESKTOP-FV493C2\HP (63) | AdventureWorks2012 | 00:00:00 | 23 rows

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

```sql
7   CREATE FUNCTION [dbo].[ufnGetThreeOldestEmployee]
8   (
9       @DepartmentID    int
10  )
11  RETURNS @ret TABLE (
12      [BusinessEntityID]  [int] NOT NULL,
13      [NationalIDNumber]  [nvarchar](15) NOT NULL,
14      [LoginID]           [nvarchar](256) NOT NULL,
15      [OrganizationNode]  [hierarchyid] NULL,
16      [OrganizationLevel] [smallint] NULL,
17      [JobTitle]          [nvarchar](50) NOT NULL,
18      [BirthDate]         [date] NOT NULL,
19      [MaritalStatus]     [nchar](1) NOT NULL,
20      [Gender]            [nchar](1) NOT NULL,
21      [HireDate]          [date] NOT NULL,
22      [SalariedFlag]      [dbo].[Flag] NOT NULL,
23      [VacationHours]     [smallint] NOT NULL,
24      [SickLeaveHours]    [smallint] NOT NULL,
25      [CurrentFlag]       [dbo].[Flag] NOT NULL,
26      [rowguid]           [uniqueidentifier] ROWGUIDCOL  NOT NULL,
27      [ModifiedDate]      [datetime] NOT NULL
28  )
29  BEGIN
30  INSERT INTO @ret
31      SELECT TOP(3) [employee].* FROM [HumanResources].[Employee] [employee]
32      INNER JOIN [HumanResources].[EmployeeDepartmentHistory] [history]
33          ON  [employee].[BusinessEntityID]   = [history].[BusinessEntityID]
34      WHERE   [history].[DepartmentID]         = @DepartmentID
35          AND [history].[StartDate]    BETWEEN '2005' and '2006'
36          AND [history].[EndDate] IS NULL
37      ORDER BY [employee].[BirthDate] ASC
38      RETURN
39  END;
```

75 %

🗗 Messages

```
Commands completed successfully.

Completion time: 2020-11-06T14:28:02.1437913+03:00
```

| f | Вызов multistatement table-valued функции с применением CROSS APPLY и OUTER APPLY |

```sql
109  SELECT * FROM [HumanResources].[Department] [department]
110  CROSS APPLY [dbo].[ufnGetThreeOldestEmployee]([department].[DepartmentID]);
```

75 %

▦ Results  ▧ Messages

|  | DepartmentID | Name | GroupName | ModifiedDate | BusinessEntityID | NationalIDNumber | LoginID | Organi |
|---|---|---|---|---|---|---|---|---|
| 3 | 2 | Tool Design | Research and Development | 2002-06-01 00:00:00.000 | 11 | 974026903 | adventure-works\ovidiu0 | 0x5AE |
| 4 | 2 | Tool Design | Research and Development | 2002-06-01 00:00:00.000 | 13 | 486228782 | adventure-works\janice0 | 0x5AE |
| 5 | 3 | Sales | Sales and Marketing | 2002-06-01 00:00:00.000 | 274 | 502097814 | adventure-works\stephen0 | 0x956 |
| 6 | 3 | Sales | Sales and Marketing | 2002-06-01 00:00:00.000 | 277 | 615389812 | adventure-works\jillian0 | 0x956 |
| 7 | 3 | Sales | Sales and Marketing | 2002-06-01 00:00:00.000 | 282 | 399771412 | adventure-works\josé1 | 0x957 |
| 8 | 4 | Marketing | Sales and Marketing | 2002-06-01 00:00:00.000 | 20 | 323403273 | adventure-works\wanida0 | 0x6C2 |
| 9 | 4 | Marketing | Sales and Marketing | 2002-06-01 00:00:00.000 | 19 | 52541318 | adventure-works\mary2 | 0x6BC |
| 10 | 4 | Marketing | Sales and Marketing | 2002-06-01 00:00:00.000 | 18 | 222969461 | adventure-works\john5 | 0x6B4 |
| 11 | 5 | Purchasing | Inventory Management | 2002-06-01 00:00:00.000 | 261 | 280633567 | adventure-works\reinout0 | 0x85E |
| 12 | 5 | Purchasing | Inventory Management | 2002-06-01 00:00:00.000 | 260 | 437296311 | adventure-works\annette0 | 0x85E |
| 13 | 8 | Productio... | Manufacturing | 2002-06-01 00:00:00.000 | 224 | 621209647 | adventure-works\william0 | 0x7BD |

✅ Query executed successfully.    DESKTOP-FV493C2 (15.0 RTM)  DESKTOP-FV493C2\HP (62)  AdventureWorks2012  00:00:00  13

```sql
115  SELECT * FROM [HumanResources].[Department] [department]
116  OUTER APPLY [dbo].[ufnGetThreeOldestEmployee]([department].[DepartmentID]);
```

75 %

▦ Results  ▧ Messages

|  | DepartmentID | Name | GroupName | ModifiedDate | BusinessEntityID | NationalIDNumber | LoginID | Organi |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | Engineering | Research and Development | 2002-06-01 00:00:00.000 | 15 | 56920285 | adventure-works\sharon0 | 0x5AE |
| 2 | 1 | Engineering | Research and Development | 2002-06-01 00:00:00.000 | 14 | 42487730 | adventure-works\michael8 | 0x5AE |
| 3 | 2 | Tool Design | Research and Development | 2002-06-01 00:00:00.000 | 11 | 974026903 | adventure-works\ovidiu0 | 0x5AE |
| 4 | 2 | Tool Design | Research and Development | 2002-06-01 00:00:00.000 | 13 | 486228782 | adventure-works\janice0 | 0x5AE |
| 5 | 3 | Sales | Sales and Marketing | 2002-06-01 00:00:00.000 | 274 | 502097814 | adventure-works\stephen0 | 0x956 |
| 6 | 3 | Sales | Sales and Marketing | 2002-06-01 00:00:00.000 | 277 | 615389812 | adventure-works\jillian0 | 0x956 |
| 7 | 3 | Sales | Sales and Marketing | 2002-06-01 00:00:00.000 | 282 | 399771412 | adventure-works\josé1 | 0x957 |
| 8 | 4 | Marketing | Sales and Marketing | 2002-06-01 00:00:00.000 | 20 | 323403273 | adventure-works\wanida0 | 0x6C2 |
| 9 | 4 | Marketing | Sales and Marketing | 2002-06-01 00:00:00.000 | 19 | 52541318 | adventure-works\mary2 | 0x6BC |
| 10 | 4 | Marketing | Sales and Marketing | 2002-06-01 00:00:00.000 | 18 | 222969461 | adventure-works\john5 | 0x6B4 |
| 11 | 5 | Purchasing | Inventory Management | 2002-06-01 00:00:00.000 | 261 | 280633567 | adventure-works\reinout0 | 0x85E |
| 12 | 5 | Purchasing | Inventory Management | 2002-06-01 00:00:00.000 | 260 | 437296311 | adventure-works\annette0 | 0x85E |

✅ Query executed successfully.    DESKTOP-FV493C2 (15.0 RTM)  DESKTOP-FV493C2\HP (62)  AdventureWorks2012  00:00:00  23