

Лабораторная работа № 3 Создание хранимых процедур в Microsoft SQL Server	ФИО	Титов А.К.
	Группа	ИБТ 460
	Предмет	Построение СУБД
	Дата отчета	
	Оценка	
	Подпись преподавателя	

Цель работы

Научиться создавать и использовать хранимые процедуры на сервере БД.

Постановка задачи

Создать хранимые процедуры с помощью операторов Create procedure, причем самостоятельно определить имена процедур. Каждая процедура будет выполнять по одному SQL запросу, которые были выполнены во второй лабораторной работе. Причем код SQL запросов нужно изменить таким образом, чтобы в них можно было передавать значения полей, по которым осуществляется поиск.

В SQL Server Management Studio в разделе хранимых процедур БД DB_Books проверить наличие процедур.

Осуществить вызов нескольких хранимых процедур из .NET

Ход выполнения работы

Задание 5

Выбрать все поля из таблицы Publishing_house таким образом, что-бы в результате порядок столбцов был следующим: Publish, City, Code_publish

The screenshot shows the Microsoft SQL Server Management Studio interface. The main window displays a SQL query in the 'Query Editor' pane:

```
ALTER PROC SelectPublishingHouse
AS
    SELECT Publish, City, Code_publish
    FROM Publishing_house
GO
```

Below the query editor, the 'Results' pane shows the execution of the query. The status bar indicates '0 rows' for the query execution. The 'Results' pane displays a table with 8 rows and 3 columns: Publish, City, and Code_publish.

	Publish	City	Code_publish
1	Детская литература	Москва	1
2	Малыш	СПб	2
3	Наука	Москва	3
4	Смена	Барнаул	4
5	АСТ	Воронеж	5
6	Диалектика	Москва	6
7	Деагостини	Мадрид	7
8	Springer	New Y...	8

The status bar at the bottom indicates 'Item(s) Saved', 'Ln 5', 'Col 3', 'Ch 3', and 'INS'.

Задание 9

Выбрать из справочника поставщиков (таблица Deliveries) названия компаний, телефоны и ИНН (поля Name_company, Phone и INN), у которых название компании (поле Name_company) начинается с 'ОАО'

The screenshot shows the Microsoft SQL Server Management Studio interface. The main query window displays the following SQL code:

```
ALTER PROC DeliveriesForCompany @CompanyNameFormat AS VARCHAR(20)
AS
SELECT Name_company, Phone, INN
FROM Deliveries
WHERE Name_company LIKE @CompanyNameFormat
GO
```

The Messages pane shows the execution of the query, indicating that 0 rows were returned. Below this, the Results pane shows the execution of the stored procedure with the parameter '@CompanyNameFormat = 'Д'':

```
EXEC DeliveriesForCompany @CompanyNameFormat='Д'
```

The Results pane displays the following data:

	Name_company	Phone	INN
1	Доставкин	791245654652	896541237
2	Деловые перевозки	791745789453	123465456
3	Деловая почта	796845124745	652389456
4	Доставка книг	756457585123	488498853

The status bar at the bottom indicates the current position is at Line 1, Column 38, Character 38, and the operation is Insert (INS).

Задание 15

Вывести список названий книг (поле Title_book из таблицы Books) и количество экземпляров (поле Amount из таблицы Purchases), которые были закуплены в период с 12.03.2003 по 15.06.2003 (условие по полю Date_order из таблицы Purchases).

The screenshot shows the Microsoft SQL Server Management Studio interface. The main window displays a SQL query in a script editor. The query defines a stored procedure named BooksInfoByDateRange and then executes it with specific date parameters.

Script Editor Content:

```

CREATE PROC BooksInfoByDateRange @DateFrom AS DATE, @DateTo AS DATE
AS
SELECT Books.Title_book, Purchases.Amount
FROM Books
JOIN Purchases ON Purchases.Code_book = Books.Code_book
WHERE Purchases.Date_order BETWEEN @DateFrom AND @DateTo
GO
    
```

Messages Panel:

Query... | DESKTOP-KRUN6KM\SQLEXPRESS ... | DESKTOP-KRUN6KM\Aleks... | DB_BOOKS | 00:00:00 | 0 rows

Test15.sql - DESKTOP-KRUN6KM\... | Test9.sql - DESKTOP-KRUN6KM\... |
 EXEC BooksInfoByDateRange @DateFrom='01.01.2013', @DateTo='01.01.2014'

Results Panel:

	Title_book	Amount
1	Сказки	5
2	Solid State Physics	1

Query... | DESKTOP-KRUN6KM\SQLEXPRESS ... | DESKTOP-KRUN6KM\Aleks... | DB_BOOKS | 00:00:00 | 2 rows

Ready | Ln 1 | Col 1 | INS

Задание 19

Вывести список названий книг (поле Title_book) из таблицы Books, которые выпущены следующими издательствами: 'Питер-Софт', 'Альфа', 'Наука' (условие по полю Publish из таблицы Publishing_house).

The screenshot shows the Microsoft SQL Server Management Studio interface. The main query window displays the definition of a stored procedure named `BooksNamesByPublishHouse`. The procedure takes a parameter `@PublishHouseName AS VARCHAR(20)` and returns a list of book titles from the `Books` table, joined with the `Publishing_house` table, where the publish name matches the parameter.

```
ALTER PROC BooksNamesByPublishHouse @PublishHouseName AS VARCHAR(20)
AS
SELECT Books.Title_book, Publishing_house.Publish
FROM Books
JOIN Publishing_house ON Publishing_house.Code_publish = Books.Code_p
WHERE Publishing_house.Publish = @PublishHouseName
GO
```

Below the query window, the `Messages` pane shows the execution of the procedure with the parameter `'Малыш'`.

```
EXEC BooksNamesByPublishHouse @PublishHouseName='Малыш'
```

The `Results` pane at the bottom displays the output of the query, showing three rows of book titles and their corresponding publish names.

	Title_book	Publish
1	Маскарад	Малыш
2	Путешествие из Петербурга в Москву	Малыш
3	Сказки	Малыш

The status bar at the bottom indicates the current position is at line 1, column 1, and the data type is `INS`.

Задание 25

Выбрать коды авторов (поле Code_author), имена авторов (поле Name_author), названия соответствующих книг (поле Title_book), если код издательства (поле Code_Publish) находится в диапазоне от 10 до 25 и количество страниц (поле Pages) в книге больше 120.

The screenshot displays the Microsoft SQL Server Management Studio interface. The main window shows a SQL script for a stored procedure named 'AuthorInfoByPagesCountAndPublishCode'. The script defines parameters for page count, publish code range, and page count, and then selects author and book information based on these criteria. Below the script, the 'Test25.sql' file shows the execution of the procedure with parameters 300, 1, and 10. The 'Results' pane at the bottom shows two rows of data.

```
CREATE PROC AuthorInfoByPagesCountAndPublishCode @PagesCountMin AS INT,
                                                    @PublishCodeMin AS INT,
                                                    @PublishCodeMax AS INT
AS
SELECT Authors.Code_author, Authors.name_author
FROM Authors
JOIN Books on Books.Code_author = Authors.Code_author
WHERE Books.Pages > @PagesCountMin AND Books.Code_publish BETWEEN @PublishCodeMin AND @PublishCodeMax
GO
```

Test25.sql - DESKTOP-KRUN6KM\...\Ale...

```
EXEC AuthorInfoByPagesCountAndPublishCode 300, 1, 10
```

	Code_author	name_author
1	5	СИДОРОВ С.М.
2	3	ИВАНОВ С.В.

Item(s) Saved Ln 1 Col 1 INS

Задание 29

Вывести список поставщиков (поле Name_company), которые поставляют книги издательства 'Питер' (условие по полю Publish).

The screenshot shows the Microsoft SQL Server Management Studio interface. The main window displays a SQL script in a query editor. The script defines a stored procedure named `GetCompaniesNameByPublishingHouse` that takes a parameter `@PublishHouseName`. The procedure's logic is as follows:

```
CREATE PROCEDURE GetCompaniesNameByPublishingHouse @PublishHouseName as
AS
    SELECT Deliveries.Name_company, Publishing_house.Publish
    FROM Deliveries
    JOIN Purchases on Purchases.Code_delivery = Deliveries.Code_delivery
    JOIN Books on Books.Code_book = Purchases.Code_book
    JOIN Publishing_house on Publishing_house.Code_publish = Books.Code_publish
    WHERE Publishing_house.Publish = @PublishHouseName
GO
```

Below the query editor, the **Messages** pane shows the execution status: "Query... | DESKTOP-KRUN6KM\SQLEXPRESS ... | DESKTOP-KRUN6KM\Aleks... | DB_BOOKS | 00:00:00 | 0 rows".

The **Test29.sql** query window shows the execution command:

```
EXEC GetCompaniesNameByPublishingHouse 'Малыш'
```

The **Results** pane displays the output of the query as a table with two columns: `Name_company` and `Publish`. The results are as follows:

	Name_company	Publish
1	ИП Михайлов А.Р.	Малыш
2	Доставкин	Малыш

The status bar at the bottom indicates "Item(s) Saved" and shows the cursor position at "Ln 1 Col 47 Ch 47 INS".

Задание 35

Вывести общее количество всех поставок (использовать любое поле из таблицы Purchases), выполненных в период с 01.01.2003 по 01.02.2003 (условие по полю Date_order).

The screenshot shows the Microsoft SQL Server Management Studio interface. The main window displays a SQL script for a stored procedure named `GetPurchasesByDateRange`. The script is as follows:

```
CREATE PROCEDURE GetPurchasesByDateRange @DateFrom AS Date,  
                                         @DateTo   AS Date  
  
AS  
  
    DECLARE @PurchasesCounts TABLE (  
        Count int  
    );  
  
    INSERT INTO @PurchasesCounts  
    SELECT Purchases.Amount  
    FROM Purchases  
    WHERE Date_order BETWEEN @DateFrom AND @DateTo  
    SELECT SUM(Count) FROM @PurchasesCounts  
  
GO
```

Below the script, the `Messages` pane shows the execution status: "Query... | DESKTOP-KRUN6KM\SQLEXPRESS ... | DESKTOP-KRUN6KM\Alekse... | DB_BOOKS | 00:00:00 | 0 rows".

The `Results` pane shows the output of the `EXEC` command. It displays a single row with the value 8.

	(No column name)
1	8

The status bar at the bottom indicates "Ready" and shows the current position: "Ln 1 Col 56 Ch 56 INS".

Задание 39

Вывести название книги (поле Title_book), суммарную стоимость партии одноименных книг (использовать поля Amount и Cost), поместив в результат в поле с названием ltoго, в поставках за период с 01.01.2002 по 01.06.2002 (условие по полю Date_order).

The screenshot shows the Microsoft SQL Server Management Studio interface. The main window displays a SQL script in a query editor. The script creates a stored procedure named GetBookTitleByDateOrderRange. The procedure takes two parameters: @DateFrom and @DateTo, both of type AS DATE. The procedure body is as follows:

```

CREATE PROCEDURE GetBookTitleByDateOrderRange @DateFrom AS DATE,
                                                @DateTo AS DATE
AS
SELECT Books.Title_book, SUM(Purchases.Cost * Purchases.Amount) as ltoго
FROM Books
INNER JOIN Purchases on Purchases.Code_book = Books.Code_book
WHERE Purchases.Date_order BETWEEN @DateFrom AND @DateTo
GROUP BY Books.Title_book
GO

```

Below the query editor, the Messages pane shows the command completed successfully. The Query window shows the execution of the stored procedure with the following command:

```

EXEC GetBookTitleByDateOrderRange '01.01.2002', '01.01.2016'

```

The Results pane displays the output of the query, showing three rows of data:

	Title_book	ltoго
1	Graphene flakes	720
2	Solid State Physics	680.4
3	Сказки	232...

The status bar at the bottom indicates the current line is Ln 1, column Col 1, and the status is Ready.

Задание 45

Вывести список названий компаний-поставщиков (поле Name_company) и названия книг (поле Title_book), которые они поставили.

The screenshot shows the Microsoft SQL Server Management Studio interface. The main window displays a SQL script in a query editor. The script defines a stored procedure named `GetCompaniesNamesAndTheirBookTitles`. The procedure declares a table variable `@CompaniesNames` with columns `CompanyName` and `TitleBook`, both of type `char(20)`. It then performs an `INSERT` operation into this table variable, selecting data from the `Deliveries` table, joined with the `Purchases` and `Books` tables. The `JOIN` conditions are `Deliveries.Code_delivery = Purchases.Code_delivery` and `Purchases.Code_book = Books.Code_book`.

Below the query editor, the `Messages` pane shows the execution of the stored procedure. The status bar at the bottom indicates that the query was executed successfully, returning 4 rows.

The `Results` pane displays the following data:

	CompanyName	TitleBook
1	ИП Михайлов А.Р.	Сказки
2	Посылка	Solid State Physics
3	Доставкин	Сказки
4	ИП Михайлов А.Р.	Graphene flakes

Задание 49

Вывести список названий компаний-поставщиков (поле Name_company) и поместить результат в курсор с названием Temp2.

The screenshot displays the Microsoft SQL Server Management Studio interface. The main window shows a SQL script for a stored procedure named `PrintCompanies`. The script uses a cursor to iterate through the `Deliveries` table, printing the `Name_company` values. Below the script, the `Messages` pane shows the execution of `EXEC PrintCompanies`. The results pane at the bottom displays the output of the procedure, listing company names: `ИП Михайлов А.Р.`, `Главдоставка`, `Доставкин`, `Промдоставка`, `Деловые перевозки`, and `Деловая почта`. The status bar at the bottom indicates the current position in the script: `Ready`, `Ln 2`, `Col 21`, `Ch 21`, and `INS`.

```
CREATE PROC PrintCompanies
AS
    DECLARE CompaniesNamesCursor CURSOR FOR (select Deliveries.Name_compa
    DECLARE @CompanyName CHAR(20)

    OPEN CompaniesNamesCursor
    WHILE @@FETCH_STATUS = 0
    BEGIN
        FETCH NEXT FROM CompaniesNamesCursor INTO @CompanyName
        PRINT @CompanyName
    END
    CLOSE CompaniesNamesCursor
    DEALLOCATE CompaniesNamesCursor
```

Messages

Query... | DESKTOP-KRUN6KM\SQLEXPRESS ... | DESKTOP-KRUN6KM\Alekse... | DB_BOOKS | 00:00:00 | 0 rows

Test49.sql - DESKTOP-KRUN6KM\... | Test45.sql - DESKTOP-KRUN6KM\.....

EXEC PrintCompanies

Messages

ИП Михайлов А.Р.
Главдоставка
Доставкин
Промдоставка
Деловые перевозки
Деловая почта

Query... | DESKTOP-KRUN6KM\SQLEXPRESS ... | DESKTOP-KRUN6KM\Alekse... | DB_BOOKS | 00:00:00 | 0 rows

Ready | Ln 2 | Col 21 | Ch 21 | INS

Задание 55

Вывести список авторов (поле Name_author), книг которых нет в таблице Books.

The screenshot displays the Microsoft SQL Server Management Studio interface. The main query editor shows a T-SQL script to create a stored procedure and execute it. The script is as follows:

```
CREATE PROCEDURE GetAuthorsWithoutBooks
AS
SELECT Authors.name_author
FROM Books
JOIN Authors on Books.Code_author = Authors.Code_author
WHERE Authors.Code_author NOT IN(SELECT Books.Code_author)
GO
```

Below the query editor, the Messages pane shows the execution of the query, indicating that 0 rows were returned. The Results pane shows a single column named 'name_author'.

At the bottom of the window, the status bar indicates the current position: Ready, Ln 1, Col 28, Ch 28, INS.

Задание 59

Увеличить в таблице Purchases цену (поле Cost) на 20 процентов, если заказы были оформлены в течение последнего месяца (условие по полю Date_order).

The screenshot displays the Microsoft SQL Server Management Studio interface. The main window shows a SQL script in a query editor. The script defines a stored procedure named `IncreasePurchasesByDateOrder` that takes a date parameter `@DateOrder`. The procedure first prints 'Before Costs', then selects the `Cost` from the `Purchases` table. It then updates the `Cost` by multiplying it by 1.2 for all orders where `Date_order` is greater than the provided `@DateOrder`. Finally, it prints 'After Costs' and selects the `Cost` from the `Purchases` table again. The script ends with `GO`.

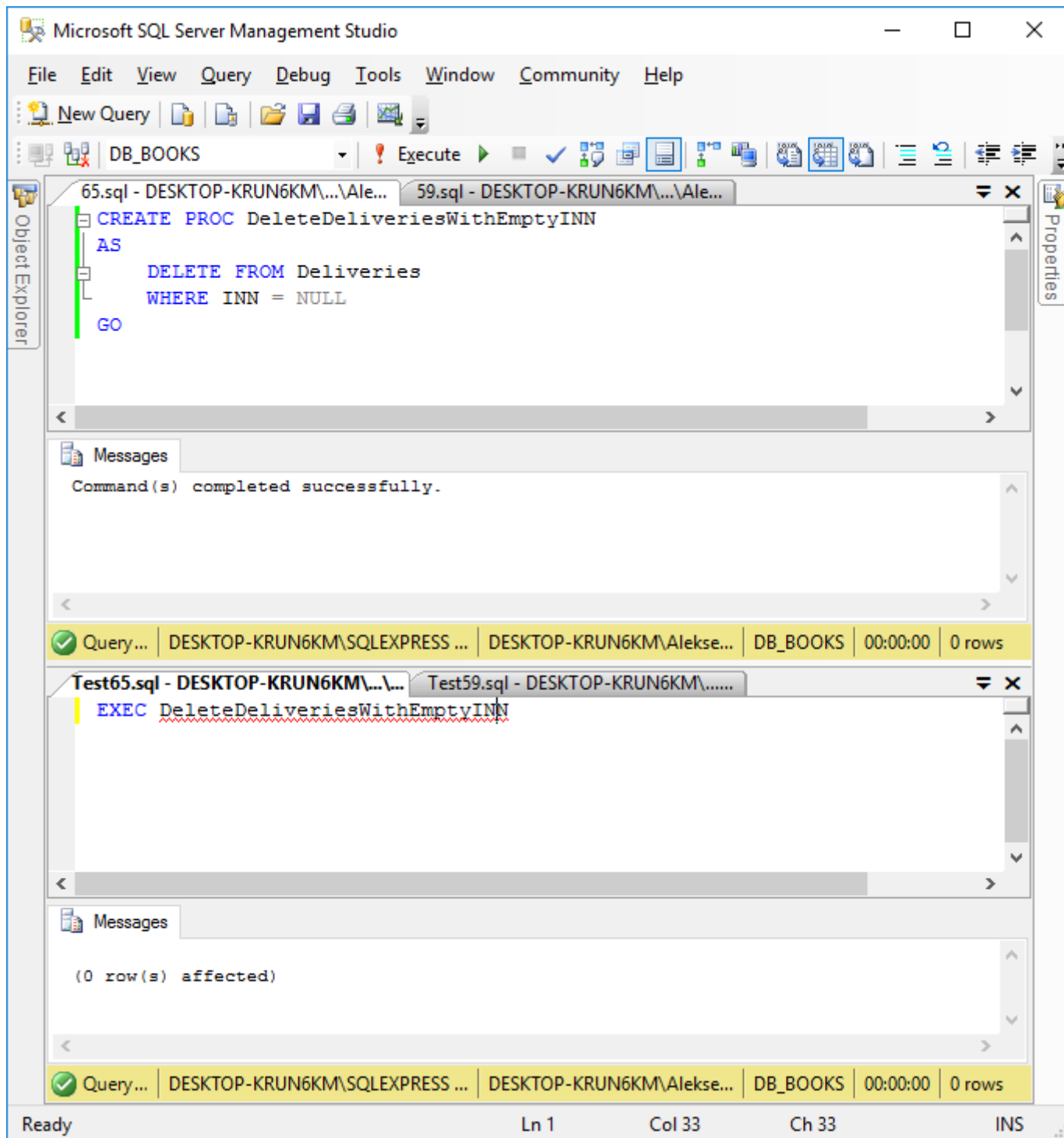
Below the query editor, the `Messages` pane shows the execution of the stored procedure with the date `'01.01.2013'`. The `Results` pane displays the output of the `SELECT` statements, showing a table with one column, `Cost`, and three rows of data.

	Cost
1	489.6
2	816.48
3	336.96

The status bar at the bottom indicates the current position in the script: Item(s) Saved, Ln 1, Col 47, Ch 47, INS.

Задание 65

Удалить из таблицы Deliveries все записи, у которых не указан ИНН (поле INN пустое).



Часть 2. Вызов хранимых процедур из Visual Studio

```
using System;
using System.Collections.Generic;
using System.Data;
using System.Data.SqlClient;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace StoredProceduresCall
{
    class Program
    {
        static void Main(string[] args)
        {
            // создаем и открываем подключение к базе данных
            using (SqlConnection conn = new SqlConnection(GetDatabaseConnection()))
            {
                conn.Open();
                CallProcedureWithReturnValue(conn);
                CallProcedureWithReturnTable(conn);
                conn.Close();
                Console.ReadKey();
            }
        }

        // 35
        private static void CallProcedureWithReturnValue(SqlConnection conn)
        {
            SqlCommand procedure = new SqlCommand("GetPurchasesByDateRange", conn);
            procedure.CommandType = CommandType.StoredProcedure;
            string date_from = "01.01.2003";
            string date_to = "01.02.2016";
            procedure.Parameters.AddWithValue("@DateFrom", date_from);
            procedure.Parameters.AddWithValue("@DateTo", date_to);
            var count_of_purchases = procedure.ExecuteScalar();
            Console.WriteLine("Count of purchases from {0} to {1} is {2}", date_from, date_to, (int)
count_of_purchases);
        }

        // 39
        private static void CallProcedureWithReturnTable(SqlConnection conn)
        {
            SqlCommand procedure = new SqlCommand("GetBookTitleByDateOrderRange", conn);
            procedure.CommandType = CommandType.StoredProcedure;
            string date_from = "01.01.2003";
            string date_to = "01.02.2016";
            procedure.Parameters.AddWithValue("@DateFrom", date_from);
            procedure.Parameters.AddWithValue("@DateTo", date_to);
            SqlDataReader reader = procedure.ExecuteReader();

            Console.WriteLine("Book title and summ of selling for books published from {0} to {1}", date_from,
date_to);
            while (reader.Read())
            {
                for (int i = 0; i < reader.FieldCount; i++)
                {
                    Console.Write(reader[i]);
                    Console.Write(" | ");
                }
                Console.WriteLine();
            }

            reader.Close();
        }

        private static string GetDatabaseConnection()
        {
            return "server=\\.\\SQLEXPRESS;" +
                "integrated security=SSPI;" +
                "database=DB_BOOKS";
        }
    }
}
```

Результат работы

```
file:///D:/My/Study/Current/Построение СУБД/Labs/3/StoredProceduresCall/bin/Debug/StoredProceduresCall.EXE
Count of purchases from 01.01.2003 to 01.02.2016 is 8
Book title and summ of selling for books published from 01.01.2003 to 01.02.2016
Graphene flakes | 1036.8 |
Solid State Physics | 979.776 |
?????? | 3341.952 |
```

Результаты вызова процедур из проекта в Visual Studio. Результаты совпадают с полученными посредством запросов и хранимых процедур, вызванных из SQL кода в SQL Management Studio.

Выводы

Были изучены азы построения хранимых процедур и вызова их из кода С#.