Лабораторная работа 4

Задание 1

1)Создайте таблицу Sales.SpecialOfferHst, которая будет хранить информацию об изменениях в таблице Sales.SpecialOffer.

```
create table Sales.SpecialOfferHst (
    ID int identity(1,1) primary key,
    Action nvarchar(15) not null,
    ModifiedDate datetime not null,
    SourceID int not null,
    UserName nvarchar(25));
go
```

⊞ ▢ Sales.SalesTerritoryHistory
⊞ ▢ Sales.ShoppingCartItem
⊞ ▢ Sales.SpecialOffer
⊞ ▢ Sales.SpecialOfferHst
⊞ ▢ Sales.SpecialOfferProduct
⊞ ▢ Sales.Store

2)Создайте три AFTER триггера для трех операций INSERT, UPDATE, DELETE для таблицы Sales.SpecialOffer. Каждый триггер должен заполнять таблицу Sales.SpecialOfferHst с указанием типа операции в поле Action.

```
create trigger Sales.trgSpecialOfferInsert
on Sales.SpecialOffer
after insert as
begin
    set nocount on;
    insert into Sales.SpecialOfferHst (
        Action,
        ModifiedDate,
        SourceID,
        UserName)
    select
        'insert',
        CURRENT_TIMESTAMP,
        SpecialOfferID,
        CURRENT_USER
    from inserted;
end
go
```

```sql
create trigger Sales.trgSpecialOfferDelete
on Sales.SpecialOffer
after delete as
begin
    set nocount on;
    insert into Sales.SpecialOfferHst (
        Action,
        ModifiedDate,
        SourceID,
        UserName)
    select
        'delete',
        CURRENT_TIMESTAMP,
        SpecialOfferID,
        CURRENT_USER
    from deleted;
end
go

create trigger Sales.trgSpecialOfferUpdate
on Sales.SpecialOffer
after update as
begin
    set nocount on;
    insert into Sales.SpecialOfferHst (
        Action,
        ModifiedDate,
        SourceID,
        UserName)
    select
        'update',
        CURRENT_TIMESTAMP,
        SpecialOfferID,
        CURRENT_USER
    from inserted;
end
go
```

```
☐ 🔲 Sales.SpecialOffer
    ⊞ 📁 Columns
    ⊞ 📁 Keys
    ⊞ 📁 Constraints
    ☐ 📁 Triggers
            ⚡ trgSpecialOfferDelete
            ⚡ trgSpecialOfferInsert
            ⚡ trgSpecialOfferUpdate
```

3)Создайте представление VIEW, отображающее все поля таблицы Sales.SpecialOffer. Сделайте невозможным просмотр исходного кода представления.

```
create view Sales.vSpecialOffer
with encryption as
select * from Sales.SpecialOffer;
go

select definition
from sys.sql_modules
where object_id = object_id('Sales.vSpecialOffer');
go
```

	definition
1	NULL

```
select * from Sales.vSpecialOffer;
go
```

	Description	Discount...	Type	Category	StartDate	EndDate	Min...	MaxQty	rowguid	ModifiedDate
8	Sport Helmet D...	0.10	Seasonal Di...	Reseller	2006-07-0...	2006-07-...	0	NULL	20C5D2...	2006-06-01 00:...
9	Road-650 Ove...	0.30	Excess Inve...	Reseller	2006-07-0...	2006-08-...	0	NULL	0CF8472...	2006-06-01 00:...
10	Mountain Tire ...	0.50	Excess Inve...	Customer	2007-06-1...	2007-08-...	0	NULL	220444A...	2007-05-16 00:...
11	Sport Helmet D...	0.15	Seasonal Di...	Reseller	2007-07-0...	2007-07-...	0	NULL	E72DAB...	2007-06-01 00:...
12	LL Road Fram...	0.35	Excess Inve...	Reseller	2007-07-0...	2007-08-...	0	NULL	C0AF1C...	2007-06-01 00:...
13	Touring-3000 ...	0.15	New Product	Reseller	2007-07-0...	2007-09-...	0	NULL	5061CC...	2007-06-01 00:...
14	Touring-1000 ...	0.20	New Product	Reseller	2007-07-0...	2007-09-...	0	NULL	1AF84A...	2007-06-01 00:...
15	Half-Price Ped...	0.50	Seasonal Di...	Customer	2007-08-1...	2007-09-...	0	NULL	03E3594...	2007-07-16 00:...
16	Mountain-500	0.40	Discontinue	Reseller	2008-05-0	2008-06-	0	NULL	EB7CB4	2008-04-01 00:

4)Вставьте новую строку в Sales.SpecialOffer через представление. Обновите вставленную строку. Удалите вставленную строку. Убедитесь, что все три операции отображены в Sales.SpecialOfferHst.

```sql
insert into Sales.vSpecialOffer (
    Description,
    DiscountPct,
    Type,
    Category,
    StartDate,
    EndDate,
    MinQty,
    rowguid,
    ModifiedDate)
values (
    'MAKAKA',
    0.45,
    'MAKAKA',
    'MAKAKA',
    CURRENT_TIMESTAMP,
    CURRENT_TIMESTAMP,
    0,
    NEWID(),
    CURRENT_TIMESTAMP);
go

update Sales.vSpecialOffer
set Description = 'NEW MAKAKA'
where Type = 'MAKAKA';
go

delete from Sales.vSpecialOffer
where Description = 'NEW MAKAKA';
go

select * from Sales.SpecialOfferHst;
go
```

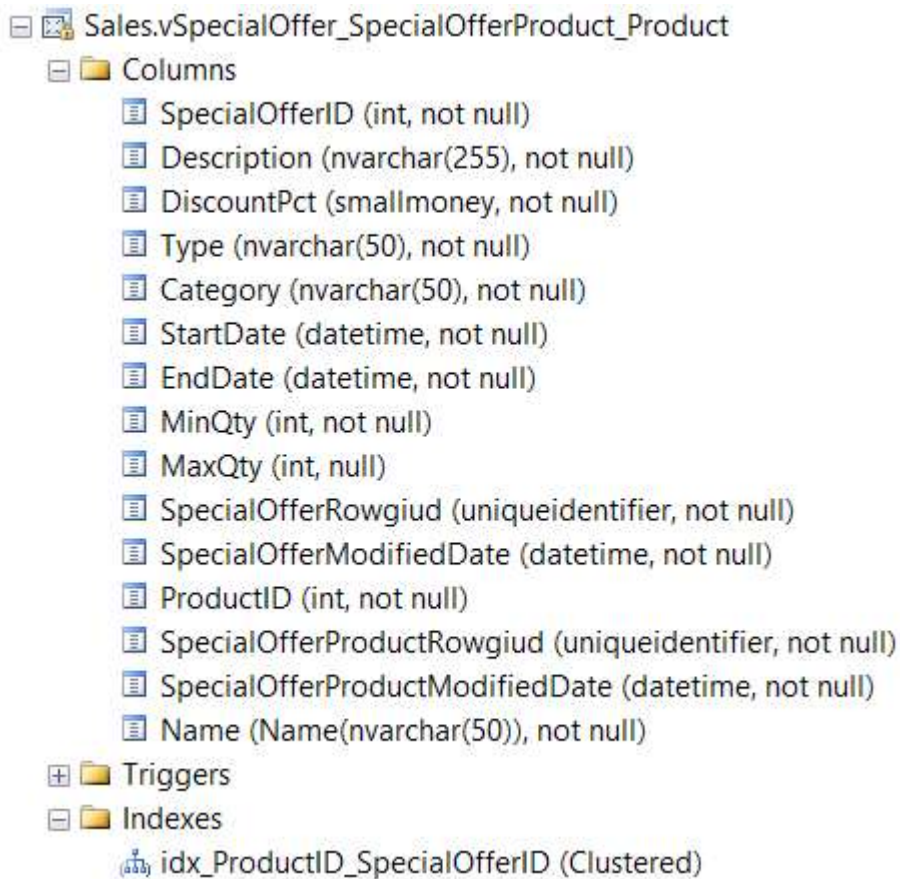|	ID	Action	ModifiedDate	Source...	UserNa...
1	1	insert	2020-10-03 20:32:30.600	17	dbo
2	2	update	2020-10-03 20:33:50.233	17	dbo
3	3	delete	2020-10-03 20:34:35.850	17	dbo

Задание 2

1) Создайте представление VIEW, отображающее данные из таблиц Sales.SpecialOffer и Sales.SpecialOfferProduct, а также Name из таблицы Production.Product. Создайте уникальный кластерный индекс в представлении по полям ProductID, SpecialOfferID.

```sql
create view Sales.vSpecialOffer_SpecialOfferProduct_Product
with schemabinding, encryption
as
select
    so.SpecialOfferID,
    so.Description,
    so.DiscountPct,
    so.Type,
    so.Category,
    so.StartDate,
    so.EndDate,
    so.MinQty,
    so.MaxQty,
    so.rowguid as SpecialOfferRowgiud,
    so.ModifiedDate as SpecialOfferModifiedDate,
    sop.ProductID,
    sop.rowguid as SpecialOfferProductRowgiud,
    sop.ModifiedDate as SpecialOfferProductModifiedDate,
    p.Name
from Sales.SpecialOffer as so
inner join Sales.SpecialOfferProduct as sop
on so.SpecialOfferID = sop.SpecialOfferID
inner join Production.Product as p
on sop.ProductID = p.ProductID;
go

create unique clustered index
    idx_ProductID_SpecialOfferID
on Sales.vSpecialOffer_SpecialOfferProduct_Product (ProductID, SpecialOfferID);
go
```

```
□ ⬛ Sales.vSpecialOffer_SpecialOfferProduct_Product
   □ 📁 Columns
      ▤ SpecialOfferID (int, not null)
      ▤ Description (nvarchar(255), not null)
      ▤ DiscountPct (smallmoney, not null)
      ▤ Type (nvarchar(50), not null)
      ▤ Category (nvarchar(50), not null)
      ▤ StartDate (datetime, not null)
      ▤ EndDate (datetime, not null)
      ▤ MinQty (int, not null)
      ▤ MaxQty (int, null)
      ▤ SpecialOfferRowgiud (uniqueidentifier, not null)
      ▤ SpecialOfferModifiedDate (datetime, not null)
      ▤ ProductID (int, not null)
      ▤ SpecialOfferProductRowgiud (uniqueidentifier, not null)
      ▤ SpecialOfferProductModifiedDate (datetime, not null)
      ▤ Name (Name(nvarchar(50)), not null)
   ⊞ 📁 Triggers
   □ 📁 Indexes
      ⚮ idx_ProductID_SpecialOfferID (Clustered)
```

2) Создайте один INSTEAD OF триггер для представления на три операции INSERT, UPDATE, DELETE. Триггер должен выполнять соответствующие операции в таблицах Sales.SpecialOffer и Sales.SpecialOfferProduct для указанного Product Name. Обновление не должно происходить в таблице Sales.SpecialOfferProduct. Удаление из таблицы Sales.SpecialOffer производите только в том случае, если удаляемые строки больше не ссылаются на Sales.SpecialOfferProduct.

```sql
create trigger Sales.trg_vSpecialOffer_SpecialOfferProduct_Product
on Sales.vSpecialOffer_SpecialOfferProduct_Product
instead of insert, update, delete
as
begin
      set nocount on;
      if exists(select * from inserted) and exists(select * from deleted)
      begin
          update so set
              so.Description = i.Description,
              so.DiscountPct = i.DiscountPct,
              so.Type = i.Type,
              so.Category = i.Category,
              so.StartDate = i.StartDate,
              so.EndDate = i.EndDate,
              so.MinQty = i.MinQty,
              so.MaxQty = i.MaxQty,
              so.rowguid = i.SpecialOfferRowgiud,
              so.ModifiedDate = i.SpecialOfferModifiedDate
          from Sales.SpecialOffer as so
          inner join inserted as i
          on so.SpecialOfferID = i.SpecialOfferID;
       end

else if exists(select * from inserted)
begin
    insert into Sales.SpecialOffer (
        SpecialOfferID, Description, DiscountPct, Type, Category,
        StartDate, EndDate, MinQty, MaxQty, rowguid, ModifiedDate)
    select
        i.SpecialOfferID, i.Description, i.DiscountPct, i.Type, i.Category,
        i.StartDate, i.EndDate, i.MinQty, i.MaxQty, i.SpecialOfferRowgiud,
        i.SpecialOfferModifiedDate
    from inserted as i;

    insert into Sales.SpecialOfferProduct(
        SpecialOfferID, ProductID, rowguid, ModifiedDate)
    select
        i.SpecialOfferID, i.ProductID, i.SpecialOfferProductRowgiud,
        i.SpecialOfferProductModifiedDate
    from inserted as i;
end
```

```sql
        else if exists(select * from deleted)
        begin
            delete sop
            from Sales.SpecialOfferProduct as sop
            inner join deleted as d
            on sop.SpecialOfferID = d.SpecialOfferID;

            delete so
            from Sales.SpecialOffer as so
            inner join deleted as d
            on so.SpecialOfferID = d.SpecialOfferID
            where not exists (
                select * from Sales.SpecialOfferProduct as sop
                where sop.SpecialOfferID = so.SpecialOfferID);
        end
end
go
```

- Sales.vSpecialOffer_SpecialOfferProduct_Product
  - Columns
  - Triggers
    - trg_vSpecialOffer_SpecialOfferProduct_Product

3)Вставьте новую строку в представление, указав новые данные SpecialOffer для существующего Product (например для 'Adjustable Race'). Триггер должен добавить новые строки в таблицы Sales.SpecialOffer и Sales.SpecialOfferProduct. Обновите вставленные строки через представление. Удалите строки.

```sql
insert into Sales.vSpecialOffer_SpecialOfferProduct_Product(
    SpecialOfferID,
    Description,
    DiscountPct,
    Type,
    Category,
    StartDate,
    EndDate,
    MinQty,
    SpecialOfferRowgiud,
    SpecialOfferModifiedDate,
    ProductID,
    SpecialOfferProductRowgiud,
    SpecialOfferProductModifiedDate,
    Name)
values (
    12345678,
    'MAKAKA',
    0.5,
    'MAKAKA',
    'MAKAKA',
    CURRENT_TIMESTAMP,
    CURRENT_TIMESTAMP,
    0,
    newid(),
    CURRENT_TIMESTAMP,
    1,
    newid(),
    CURRENT_TIMESTAMP,
    'Adjustable Race');
go
```

```sql
select * from Sales.SpecialOffer as so
where so.SpecialOfferID = 12345678;
go


select * from Sales.SpecialOfferProduct as sop
where sop.SpecialOfferID = 12345678;
go
```

	SpecialOffe...	Descripti...	Discount...	Type	Category	StartDate	EndDate	Min...	MaxQty	rowguid
1	12345678	MAKAKA	0.50	MAKAKA	MAKAKA	2020-10-03 22:35:11.583	2020-10-03 22:35:11.583	0	NULL	AFEA568

	SpecialOffe...	Produc...	rowguid	ModifiedDate
1	12345678	1	FF8E668B-9C49-42AD-80BA-1B55ABFF562F	2020-10-03 22:35:11.583

```sql
update Sales.vSpecialOffer_SpecialOfferProduct_Product
set MaxQty = 12
where SpecialOfferID = 12345678;
go


select * from Sales.SpecialOffer as so
where so.SpecialOfferID = 12345678;
go
```

	SpecialOffe...	Descripti...	Discount...	Type	Category	StartDate	EndDate	Min...	MaxQty	rowguid
1	12345678	MAKAKA	0.50	MAKAKA	MAKAKA	2020-10-03 22:35:11.583	2020-10-03 22:35:11.583	0	12	AFEA56

```sql
delete from Sales.vSpecialOffer_SpecialOfferProduct_Product
where SpecialOfferID = 12345678;
go


select * from Sales.SpecialOffer as so
where so.SpecialOfferID = 12345678;
go


select * from Sales.SpecialOfferProduct as sop
where sop.SpecialOfferID = 12345678;
go
```

	SpecialOffe...	Descripti...	Discount...	Ty...	Categ...	StartD...	EndD...	Min...	MaxQty	rowg...	ModifiedD...

	SpecialOffe...	Produc...	rowg...	ModifiedD...