Base de Dados

Apresentação de Projeto

Business Manager

P5G4

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Introdução

Este projeto tem por base a criação de uma Base de Dados de um sistema de gestão de um website. Além disso foi também utilizado Windows Forms C# (.NET Framework) permitindo criar uma interface simples para uma demonstração da utilização da Base de Dados.

As entidades principais são:

- Manager
- Staff
- Item
- Order
- Transport
- Supplier
- Store

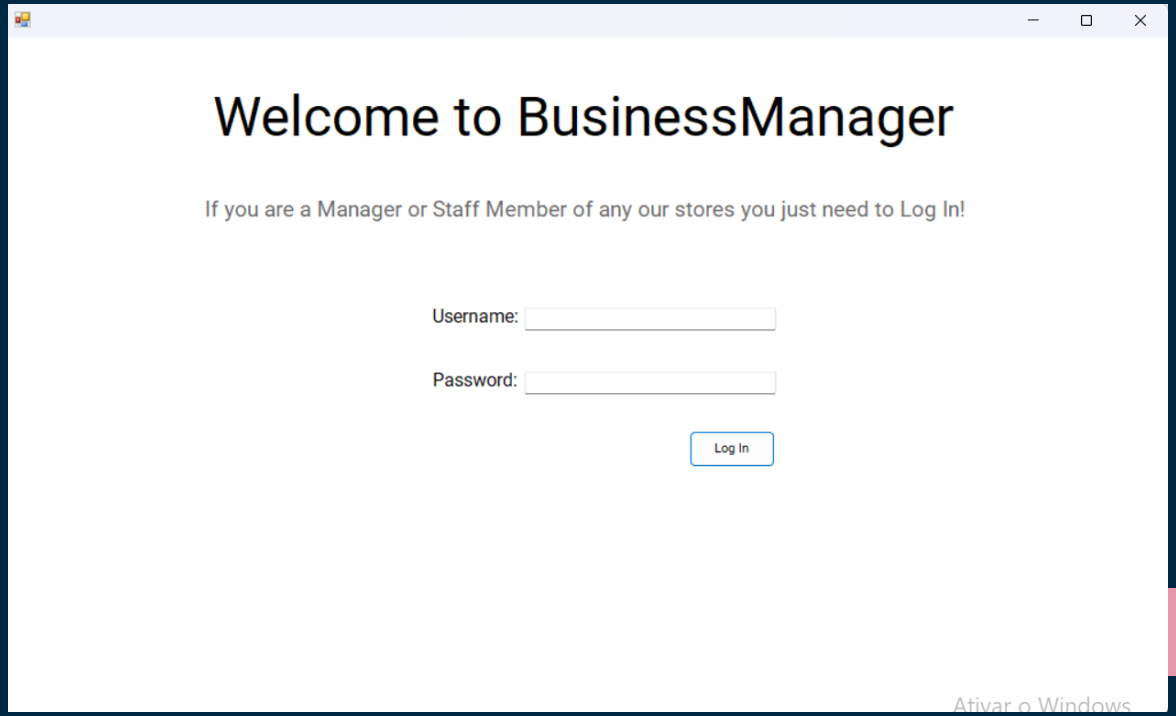
Funcionalidades do Sistema

Gestão de pedidos realizados por um Costumer

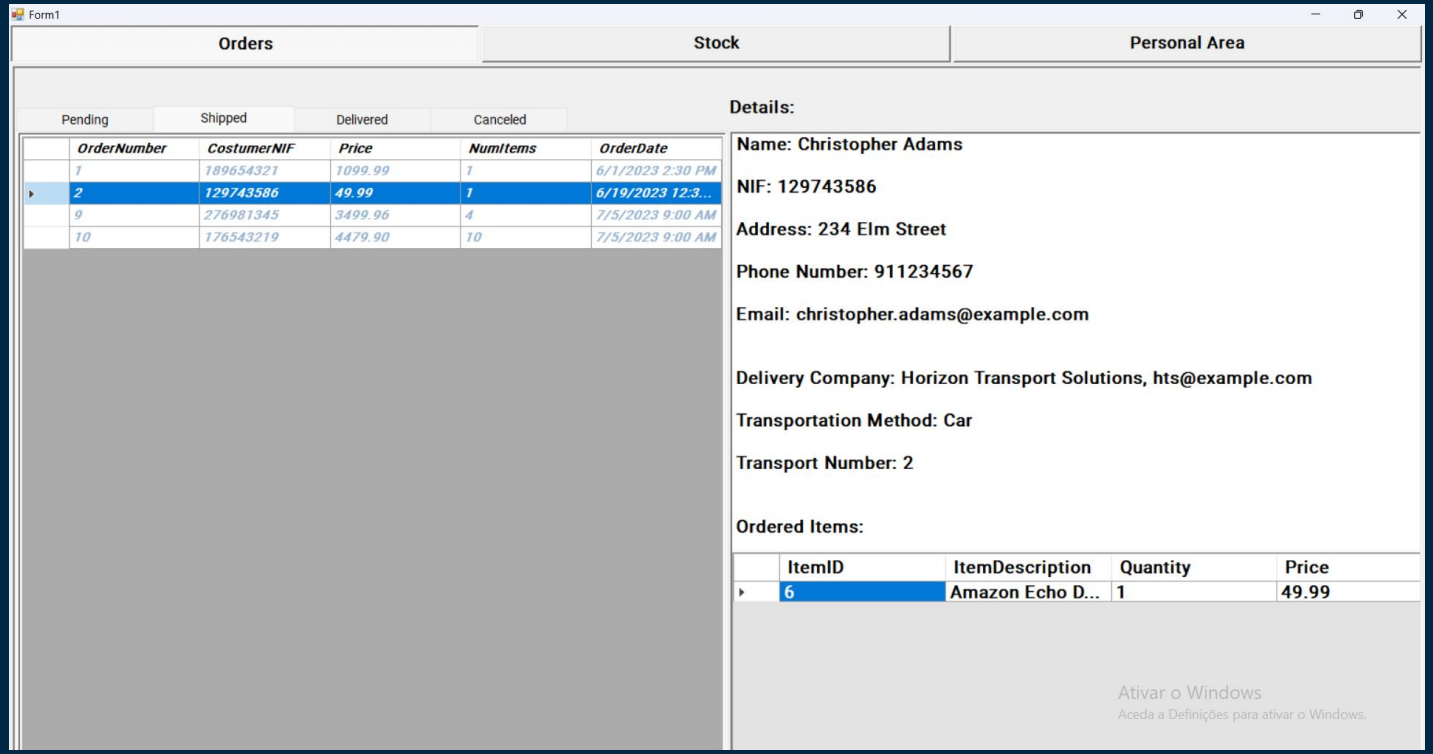
Comunicação com Fornecedores e Transportes

Visualização e gestão do Stock da Loja

Interface Login



Interface Staff



Interface Manager

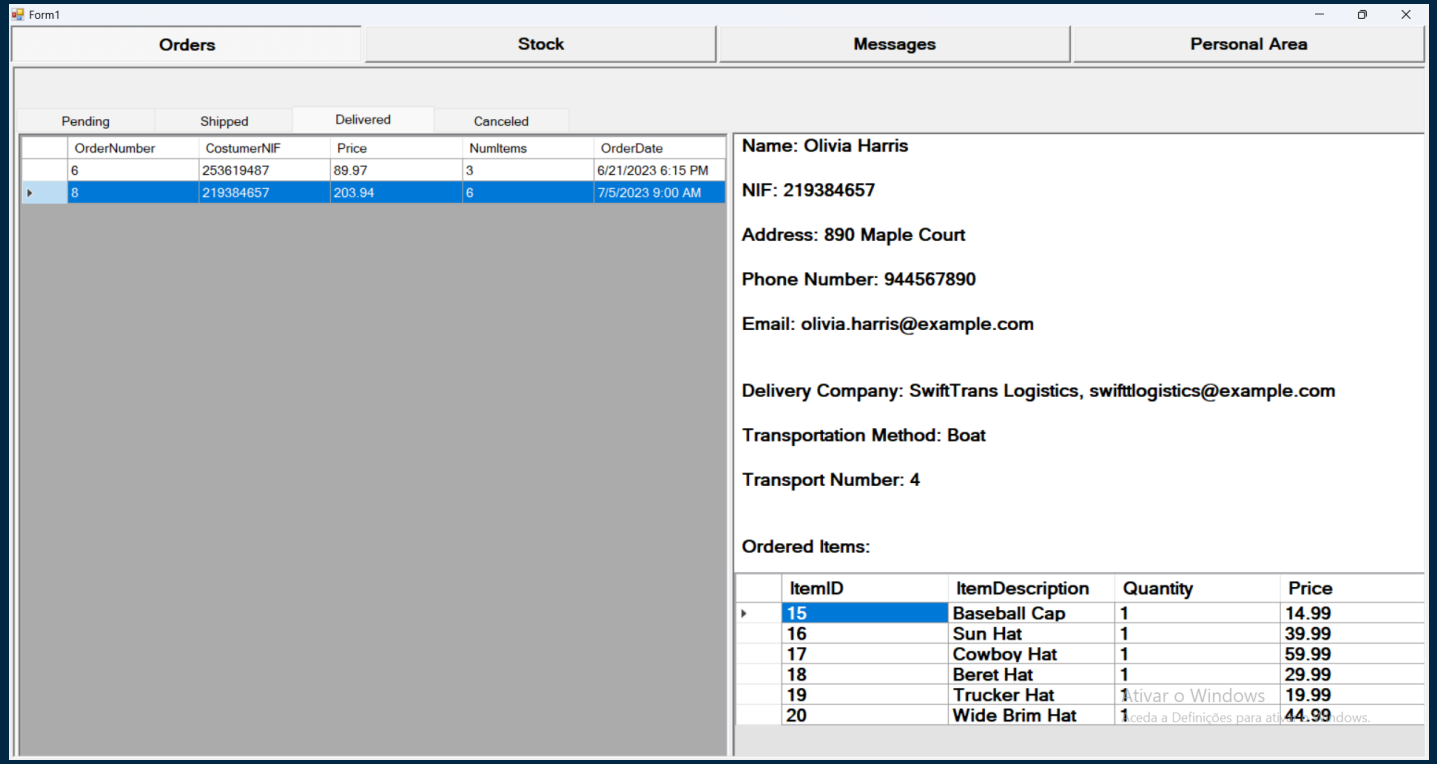
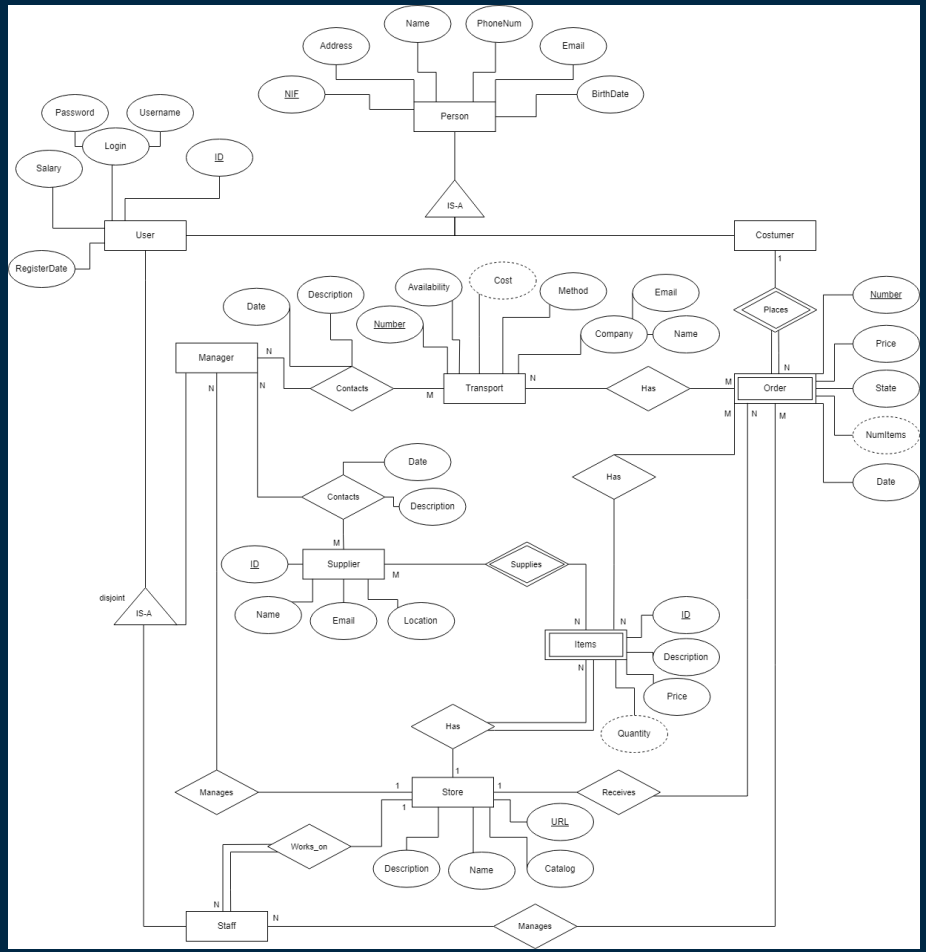


Diagrama ER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Login
Salary
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IS-A
User
Costumer
RegisterDate
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Cost
Method
Email
Number
Company
Name
Places
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Manager
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Order
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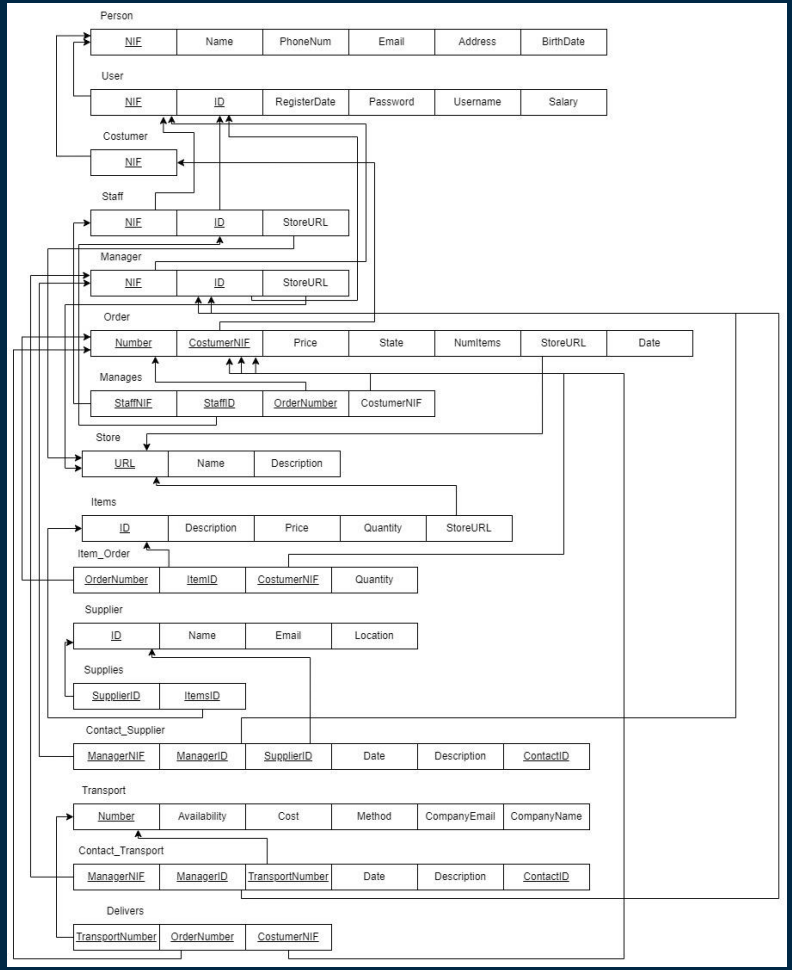
Modelo ER


Person
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Costumer
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ManagerNIF
ManagerID
SupplierID
Date
Description
ContactID
Transport
Number
Availability
Cost
Method
CompanyEmail
CompanyName
Contact_Transport
ManagerNIF
ManagerID
TransportNumber
Date
Description
ContactID
Delivers
TransportNumber
OrderNumber
CostumerNIF

Implementação das funcionalidades

- **Stored Procedures**: Maioritariamente para gerir os "inserts" em sub-entidades, garantindo a coerência do sistema

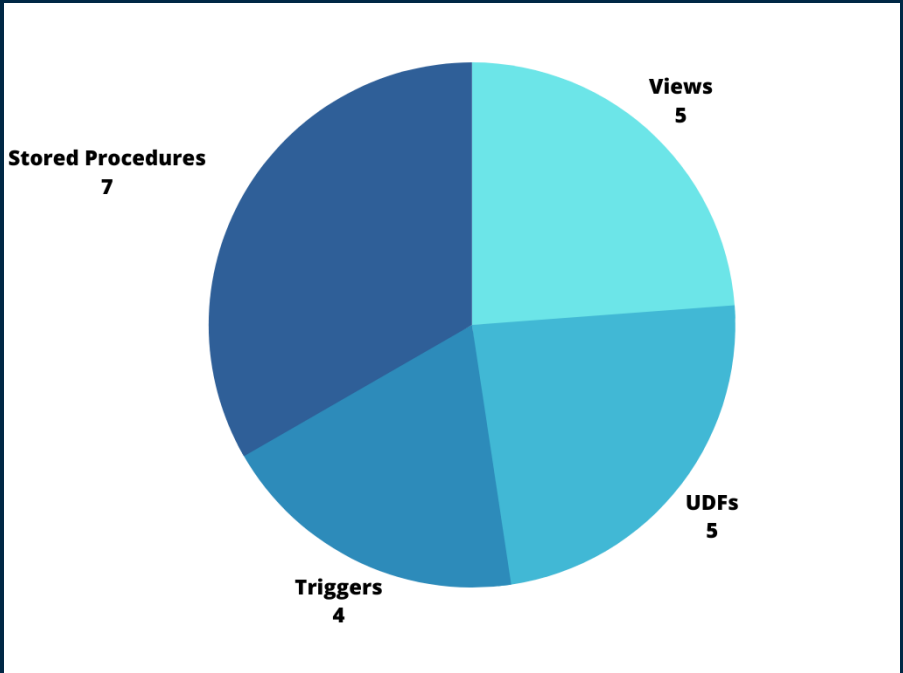
- **Triggers**: Intuito de gerar obrigatoriedades para que o sistema siga as regras de negócio, realizar a declaração de atributos que seguem uma ordem de incremento e, além disso, prevenir delete em pontos e momentos específicos.

- **Functions**: Objetivo principal de buscar informações complexas na base de dados

- **Views**: Utilizadas para fornecer uma representação virtual de dados contidos em diferentes tabelas

- **Cursor**: Implementado para percorrer tabelas que podem ter um grande volume de dados

Sql Proggraming Utilizado



Exemplos: Stored Procedures

```
-- procedure to add new manager, also adding it to the user and person table

CREATE PROC Project.addManager
@nif CHAR(9), @addr VARCHAR(30), @name VARCHAR(50), @phone CHAR(9), @email VARCHAR(30), @bdate DATE,
@password VARCHAR(20), @username VARCHAR(30), @salary INT,
@url VARCHAR(50)
AS
    BEGIN TRAN
        BEGIN TRY
            IF NOT EXISTS(SELECT NIF FROM p5g4.Project.PERSON WHERE NIF=@nif)
            BEGIN
                EXEC p5g4.Project.addUser @nif, @addr, @name, @phone, @email, @bdate, @password, @username, @salary

                DECLARE @userID INT;
                SET @userID = (SELECT ID FROM p5g4.Project.[USER] WHERE UserNIF=@nif);

                INSERT INTO p5g4.Project.Manager VALUES (@nif, @userID, @url)
            END
            COMMIT TRAN
        END TRY
        BEGIN CATCH
            IF @@TRANCOUNT > 0 ROLLBACK TRANSACTION
            RAISERROR('Not able to insert Manager (NIF already in the DB)', 16, 1)
            -- SELECT ERROR_MESSAGE() AS ErrorMessage;
        END CATCH
```

Ao inserir um novo manager é inserido também em “user” e “person”

Exemplos: Trigger

```
CREATE TRIGGER [Project].[CheckStaffSalary]
ON [Project].[STAFF]
AFTER INSERT, UPDATE
AS
BEGIN

    IF (EXISTS(SELECT 1 FROM inserted))
    BEGIN

        IF EXISTS(
            SELECT 1
            FROM inserted i
            INNER JOIN Project.MANAGER m ON i.StoreURL = m.StoreURL
            INNER JOIN Project.[USER] us ON i.StaffNIF = us.UserNIF AND i.ID = us.ID
            WHERE us.Salary > (SELECT Salary FROM Project.[USER] WHERE UserNIF = m.ManagerNIF AND ID = m.ID)
        )
        BEGIN

            RAISERROR ('O salário do usuário "Staff" não pode ser maior do que o salário do usuário "Manager" na mesma loja.', 16, 1);
            ROLLBACK TRANSACTION;
            RETURN;
        END
    END
END;
```

Garante que um membro da staff não ganhe mais que o seu manager

Exemplos: Trigger (2)

```sql
-- this table has a attribute ContactID that is autoincremented
-- so we need to get the last inserted ContactID
-- and then insert it into the trigger table

CREATE TRIGGER addContactTransportTrigger
ON Project.CONTACT_TRANSPORT
INSTEAD OF INSERT
AS
    BEGIN
        DECLARE @ContactID INT;
        DECLARE @ManagerNIF CHAR(9);
        DECLARE @ManagerID INT;
        DECLARE @TransportNumber INT;
        DECLARE @ContactDate DATETIME;
        DECLARE @ContactDescription VARCHAR(200);

        SELECT @ContactID = MAX(ContactID) FROM Project.CONTACT_TRANSPORT;
        -- if the table is empty
        IF @ContactID IS NULL
            SET @ContactID = 1;
        ELSE
            SET @ContactID = @ContactID + 1;

        SELECT @ManagerID = ManagerID, @ManagerNIF = ManagerNIF, @TransportNumber = TransportNumber, @ContactDate = ContactDate, @ContactDescription
= ContactDescription
        FROM inserted;

        INSERT INTO Project.CONTACT_TRANSPORT (ContactID, ManagerNIF, ManagerID, TransportNumber, ContactDate, ContactDescription)
        VALUES (@ContactID, @ManagerNIF, @ManagerID, @TransportNumber, @ContactDate, @ContactDescription);
    END;
```

Gera o incremento do ID para os contatos Manager-Transport

Exemplos: Functions

Buscar informações de uma loja

```
CREATE FUNCTION Project.getStoreRevenue(@StoreURL VARCHAR(50)) RETURNS TABLE
AS
RETURN
(
    SELECT s.StoreName, SUM(o.Price) AS TotalSales
    FROM Project.STORE s
    LEFT JOIN Project.[ORDER] o ON s.StoreURL = o.StoreURL
    WHERE s.StoreURL=@StoreURL
    GROUP BY s.StoreName
);
```

```
CREATE FUNCTION Project.GetItemDescriptionBySupplierName(@SupName VARCHAR(50))
RETURNS TABLE
AS
RETURN
(
    SELECT i.ItemDescription
    FROM Project.ITEM i
    JOIN Project.SUPPLIES s ON i.ID = s.ItemID
    JOIN Project.SUPPLIER sup ON s.SupplierID = sup.ID
    WHERE sup.SupName = @SupName
);
```

Items fornecidos por um supplier especifico

Exemplos: Views

```
CREATE VIEW Project.ItemsInOrderView
AS
    SELECT OrderNumber, ItemID, ITEM_ORDER.Quantity, ItemDescription, Price
    FROM Project.ITEM_ORDER JOIN Project.ITEM ON
Project.ITEM_ORDER.ItemID=Project.ITEM.ID
```

Itens presentes, atualmente, em pedidos

```
CREATE VIEW Project.StaffTotalStatsView
AS
    SELECT StaffNIF, StaffID, COUNT(StaffNIF) AS TotalOrders, SUM(Price) AS TotalMoney
FROM (Project.MANAGES JOIN Project.[ORDER] ON Project.Manages.OrderNumber=Project.
[ORDER].OrderNumber)
    GROUP BY StaffNIF, StaffID
```

Informação relacionada a uma staff

Exemplos: Cursor

```sql
CREATE PROCEDURE Project.deleteCanceledOrders @NIF INT
AS
BEGIN
    DECLARE @StoreURL VARCHAR(50);
    DECLARE @OrderNumber INT;
    DECLARE @CostumerNIF CHAR(9);

    SET @StoreURL = (SELECT StoreURL FROM Project.MANAGER WHERE ManagerNIF = @NIF);

    IF @StoreURL IS NULL
    BEGIN
        RAISERROR('Manager with NIF %d does not exist', 16, 1, @NIF);
        RETURN;
    END

    DECLARE CanceledOrders CURSOR FAST_FORWARD
        FOR SELECT OrderNumber, CostumerNIF
        FROM Project.[ORDER]
        WHERE StoreURL = @StoreURL AND OrderState = 'Canceled';

    OPEN CanceledOrders;

    FETCH CanceledOrders INTO @OrderNumber, @CostumerNIF;

    WHILE @@FETCH_STATUS = 0
    BEGIN
        DELETE FROM Project.ITEM_ORDER WHERE OrderNumber = @OrderNumber AND CostumerNIF = @CostumerNIF;
        DELETE FROM Project.MANAGES WHERE OrderNumber = @OrderNumber AND CostumerNIF = @CostumerNIF;
        DELETE FROM Project.[ORDER] WHERE OrderNumber = @OrderNumber AND CostumerNIF = @CostumerNIF;

        FETCH CanceledOrders INTO @OrderNumber, @CostumerNIF;
    END

    CLOSE CanceledOrders;

    DEALLOCATE CanceledOrders;
END
```

Excluir pedidos cancelados

DEMO