

Project Documentation for the Motors

Certification Database

Introduction

The Motors Certification Database Project aims to efficiently manage and organize vehicle certification company (Hercules MotoCorp) data. It involves designing an Entity-Relationship (ER) model, creating and managing database tables, and performing SQL queries to extract insights. The database houses information on employees, customers, orders, payments, and products, ensuring structured data management. The project also explores advanced features.

Task 1

Database Schema & ER Diagram

The structured data pertaining to the vehicle certification procedure is stored in number of tables that make up the database schema. Among the important tables are:

Employees: Holds information on employees, such as job titles, emails, and office assignments.

Customers: Provides information about customers, including sales reps and contact details.

Orders: Keeps track of client orders, including dates and statuses.

Products: Provides a list of every product that is eligible for certification, together with details on its cost.

Payments: Keeps track of client payment information.

Order Details: Documents quantity and price, creating a connection between orders and products.

Offices: Indicates the locations of the company's offices.

Database Creation & SQL Queries

An outline of the SQL queries used to build and administer the database is given in this section. It consists of:

Creation of Databases and Tables

Stored Procedures, Functions, and Triggers

User Roles and Permissions

Sample Queries and Reports

Below are the SQL queries executed:

```
CREATE DATABASE MotorsCertification;  
GO
```

```
%  
Messages  
Commands completed successfully.  
Completion time: 2025-02-08T13:39:02.3084418+02:00  
  
--USE THE MOTORSCERTIFICATION DATABASE.  
USE MotorsCertification  
GO  
  
--CREATE ALL TABLES  
--CREATE TABLE IN THE CORRECT ORDER FOR REFERENTIAL INTEGRITY AND DEPENDENCIES.  
  
-- Create the offices table  
CREATE TABLE offices (  
    officeCode VARCHAR(10) PRIMARY KEY,  
    city VARCHAR(50) NOT NULL,  
    phone VARCHAR(50) NOT NULL,  
    addressLine1 VARCHAR(100) NOT NULL,  
    addressLine2 VARCHAR(100) NULL,  
    state VARCHAR(50) NULL,  
    country VARCHAR(50) NOT NULL,  
    postalCode VARCHAR(15) NOT NULL,  
    )  
0 %  
Messages  
Commands completed successfully.  
Completion time: 2025-02-08T13:44:43.8512488+02:00
```

```
--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
-- Create the employees table
CREATE TABLE employees (
    employeeNumber INT PRIMARY KEY,
    lastName VARCHAR(50) NOT NULL,
    firstName VARCHAR(50) NOT NULL,
    extension VARCHAR(10) NOT NULL,
    email VARCHAR(100) NOT NULL UNIQUE,
    officeCode VARCHAR(10) NOT NULL,
    reportsTo INT NULL,
    jobTitle VARCHAR(50) NOT NULL,
    CONSTRAINT FK_employees_office FOREIGN KEY (officeCode) REFERENCES offices(officeCode),
    CONSTRAINT FK_employees_reportsTo FOREIGN KEY (reportsTo) REFERENCES employees(employeeNumber)
);
```

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Messages

Commands completed successfully.

Completion time: 2025-02-08T13:47:59.0027419+02:00

```
-- Create the customers table
CREATE TABLE customers (
    customerNumber INT PRIMARY KEY,
    customerName VARCHAR(50) NOT NULL,
    contactLastName VARCHAR(50) NOT NULL,
    contactFirstName VARCHAR(50) NOT NULL,
    phone VARCHAR(50) NOT NULL,
    addressLine1 VARCHAR(50) NOT NULL,
    addressLine2 VARCHAR(50) NULL,
    city VARCHAR(50) NOT NULL,
    state VARCHAR(50) NULL,
    postalCode VARCHAR(15) NULL,
    country VARCHAR(50) NOT NULL,
    salesRepEmployeeNumber INT NULL,
    creditLimit FLOAT NULL,
    CONSTRAINT FK_customers_salesRep FOREIGN KEY (salesRepEmployeeNumber) REFERENCES employees(employeeNumber)
);
```

00 %

Messages

Commands completed successfully.

Completion time: 2025-02-08T13:51:10.6021297+02:00

```
USE MotorsCertification
GO
-- Create the orders table
CREATE TABLE orders (
    orderNumber INT PRIMARY KEY,
    orderDate DATE NOT NULL,
    requiredDate DATE NOT NULL,
    shippedDate DATE NULL,
    status VARCHAR(50) NOT NULL,
    comments TEXT NULL,
    customerNumber INT NOT NULL,
    CONSTRAINT FK_orders_customer FOREIGN KEY (customerNumber) REFERENCES customers(customerNumber)
);
```

00 %

Messages

Commands completed successfully.

Completion time: 2025-02-08T13:55:20.9386261+02:00

```
USE MotorsCertification
GO
-- Create the productlines table
CREATE TABLE productlines (
    productLine VARCHAR(50) PRIMARY KEY,
    textDescription VARCHAR(4000) NOT NULL,
    htmlDescription TEXT NULL,
    image VARBINARY(MAX) NULL
);
```

00 %

Messages

Commands completed successfully.

Completion time: 2025-02-08T13:58:21.1279140+02:00

```
USE MotorsCertification
GO
-- Create the products table
CREATE TABLE products (
    productCode VARCHAR(15) PRIMARY KEY,
    productName VARCHAR(70) NOT NULL,
    productLine VARCHAR(50) NOT NULL,
    productScale VARCHAR(10) NOT NULL,
    productVendor VARCHAR(50) NOT NULL,
    productDescription TEXT NOT NULL,
    quantityInStock SMALLINT NOT NULL,
    buyPrice FLOAT NOT NULL,
    MSRP FLOAT NOT NULL,
    CONSTRAINT FK_products_productlines FOREIGN KEY (productLine) REFERENCES productlines(productLine)
);
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-02-08T14:02:12.8882407+02:00

```
USE MotorsCertification
GO
-- Create the orderdetails table
CREATE TABLE orderdetails (
    orderNumber INT NOT NULL,
    productCode VARCHAR(15) NOT NULL,
    quantityOrdered INT NOT NULL,
    priceEach FLOAT NOT NULL,
    orderLineNumber SMALLINT NOT NULL,
    PRIMARY KEY (orderNumber, productCode),
    CONSTRAINT FK_orderdetails_orders FOREIGN KEY (orderNumber) REFERENCES orders(orderNumber),
    CONSTRAINT FK_orderdetails_products FOREIGN KEY (productCode) REFERENCES products(productCode)
);
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-02-08T14:06:25.7089649+02:00

```
USE MotorsCertification
GO
-- Create the payments table
CREATE TABLE payments (
    customerNumber INT NOT NULL,
    checkNumber VARCHAR(50) NOT NULL,
    paymentDate DATE NOT NULL,
    amount FLOAT NOT NULL,
    PRIMARY KEY (customerNumber, checkNumber),
    CONSTRAINT FK_payments_customers FOREIGN KEY (customerNumber) REFERENCES customers(customerNumber)
);
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-02-08T14:09:28.0437651+02:00

Task 2

Data Insertion

Data Insertion Constraints and Relationships

Reasons to Prevent Dependency Errors by Disabling Foreign Keys Before Insertion:

The insertion fails if table A refers to table B but there isn't any data in B yet.

Data can be inserted in any order when constraints are disabled.

Efficiency of Bulk Data Insertion

Performance can be slowed down by foreign key checks when inserting a large dataset.

The procedure is accelerated by temporarily disabling limitations.

References in Circular Form

A loop can be created in certain databases by tables referring one another.

Data can be inserted without disrupting dependencies when constraints are disabled.

SQL QUERIES AND OPERATION

```
USE MotorsCertification
GO
/*--INSERT DATA INTO THE TABLES CREATED
AND MAKE SURE TO INSERT IN THE CORRECT ORDER*/

--Insert into offices
INSERT INTO offices (officeCode, city, phone, addressLine1, addressLine2, state, country, postalCode, territory) VALUES
('1', 'San Francisco', '+1 650 219 4782', '100 Market Street', 'Suite 300', 'CA', 'USA', '94080', 'NA'),
('2', 'Boston', '+1 215 837 0825', '1550 Court Place', 'Suite 102', 'MA', 'USA', '02107', 'NA'),
('3', 'NYC', '+1 212 555 3000', '523 East 53rd Street', 'Apt. 5A', 'NY', 'USA', '10022', 'NA'),
('4', 'Paris', '+33 14 723 4404', '43 Rue Joffroy Dabbans', NULL, NULL, 'France', '75017', 'EMEA'),
('5', 'Tokyo', '+81 33 224 5000', '4-1 Kioicho', NULL, 'Chiyoda-Ku', 'Japan', '102-8578', 'Japan'),
('6', 'Sydney', '+61 2 9264 2451', '5-11 Wentworth Avenue', 'Floor #2', NULL, 'Australia', 'NSW 2010', 'APAC'),
('7', 'London', '+44 20 7877 2041', '25 Old Broad Street', 'Level 7', NULL, 'UK', 'EC2N 1HN', 'EMEA');

|

00 %
Messages
(7 rows affected)
Completion time: 2025-02-08T14:17:29.6289149+02:00

USE MotorsCertification
GO
/*--The name of the UNIQUE constraints on the 'employees' table is retrieved by this query.
In the event that duplicate key mistakes force us to drop a constraint, we need this to determine the true constraint name.
*/
-- Check for the unique constraint
SELECT name
FROM sys.objects
WHERE type = 'UQ' AND parent_object_id = OBJECT_ID('employees');

|

100 %
Results Messages
1 name
UQ_employees_A80E616486B330E4
```

```
USE MotorsCertification
GO
--Drop the Unique Constraint
ALTER TABLE employees DROP CONSTRAINT UQ__employee__AB6E6164B6B83BE4;

100 %
Messages
Commands completed successfully.
Completion time: 2025-02-08T14:27:29.2348909+02:00

--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--Insert into employees
INSERT INTO employees (employeeNumber, lastName, firstName, extension, email, officeCode, reportsTo, jobTitle) VALUES
(1002, 'Murphy', 'Diane', 'x5800', 'dmurphy@classicmodelcars.com', '1', NULL, 'President'),
(1056, 'Patterson', 'Mary', 'x4611', 'mpatterson@classicmodelcars.com', '1', 1002, 'VP Sales'),
(1076, 'Firrelli', 'Jeff', 'x9273', 'jfirrelli@classicmodelcars.com', '1', 1002, 'VP Marketing'),
(1088, 'Patterson', 'William', 'x4871', 'wpatterson@classicmodelcars.com', '6', 1056, 'Sales Manager (APAC)'),
(1102, 'Bondur', 'Gerard', 'x5408', 'gbondur@classicmodelcars.com', '4', 1056, 'Sales Manager (ENEAE)'),
(1143, 'Bow', 'Anthony', 'x5428', 'abow@classicmodelcars.com', '1', 1056, 'Sales Manager (NA)'),
(1165, 'Jennings', 'Leslie', 'x3291', 'ljennings@classicmodelcars.com', '1', 1143, 'Sales Rep'),
(1166, 'Thompson', 'Leslie', 'x4065', 'lthompson@classicmodelcars.com', '1', 1143, 'Sales Rep'),
(1188, 'Firrelli', 'Julie', 'x2173', 'jfirrelli@classicmodelcars.com', '2', 1143, 'Sales Rep'),
(1216, 'Patterson', 'Steve', 'x4334', 'spatterson@classicmodelcars.com', '2', 1143, 'Sales Rep'),
(1286, 'Tseng', 'Foon Yue', 'x2248', 'ftseng@classicmodelcars.com', '3', 1143, 'Sales Rep'),
(1323, 'Vanauf', 'George', 'x4102', 'gvanauf@classicmodelcars.com', '3', 1143, 'Sales Rep'),
(1337, 'Bondur', 'Loui', 'x6493', 'lbondur@classicmodelcars.com', '4', 1102, 'Sales Rep'),

100 %
Messages
(20 rows affected)
Completion time: 2025-02-08T14:30:19.9657462+02:00

--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--Disable Foreign Key on customers
ALTER TABLE customers NOCHECK CONSTRAINT FK_customers_salesRep;

100 %
Messages
Commands completed successfully.
Completion time: 2025-02-08T14:35:05.8209012+02:00

USE MotorsCertification
GO
--Insert into customer
INSERT INTO customers (customerNumber, customerName, contactLastName, contactFirstName, phone, addressLine1, addressLine2, city, state, postalCode) VALUES
(103, 'Atelier graphique', 'Schmitt', 'Carine', '40.32.2555', '54, rue Royale', NULL, 'Nantes', NULL, '44000', 'France', 1370, 21000),
(112, 'Signal Gift Stores', 'King', 'Jean', '7025551838', '8489 Strong St.', NULL, 'Las Vegas', 'NV', '83030', 'USA', 1166, 71800.00),
(114, 'Australian Collectors, Co.', 'Ferguson', 'Peter', '03 9520 4555', '636 St Kilda Road', 'Level 3', 'Melbourne', 'Victoria', '3', 1166, 71800.00),
(119, 'La Rochelle Gifts', 'Labrun', 'Janine', '40.67.8555', '67, rue des Cinquante Otages', NULL, 'Nantes', NULL, '44000', 'France', 1370, 21000),
(121, 'Baane Mini Imports', 'Bergulfsen', 'Jonas', '07-98 9555', 'Erling Skakkes gate 78', NULL, 'Stavern', NULL, '4110', 'Norway', 1166, 71800.00),
(124, 'Mini Gifts Distributors Ltd.', 'Nelson', 'Susan', '4155551450', '5677 Strong St.', NULL, 'San Rafael', 'CA', '97562', 'USA', 1166, 71800.00),
(125, 'Havel & Zbyszek Co', 'Piestrzewicz', 'Zbyszek', '(26) 642-7555', 'ul. Filtrowa 68', NULL, 'Warszawa', NULL, '01-012', 'Pol', 1166, 71800.00),
(128, 'Blauer See Auto, Co.', 'Keitel', 'Roland', '49 69 66 90 2555', 'Lyonerstr. 34', NULL, 'Frankfurt', NULL, '60528', 'Germany', 1166, 71800.00),
(129, 'Mini Wheels Co.', 'Murphy', 'Julie', '650555787', '5557 North Pendale Street', NULL, 'San Francisco', 'CA', '94217', 'USA', 1166, 71800.00),
(131, 'Land of Toys Inc.', 'Lee', 'Kwai', '2125557818', '897 Long Airport Avenue', NULL, 'NYC', 'NY', '10022', 'USA', 1323, 114900.00),
(141, 'Euro+ Shopping Channel', 'Freyre', 'Diego', '(91) 555 94 44', 'C/ Moralzarzal, 86', NULL, 'Madrid', NULL, '28034', 'Spain', 1166, 71800.00),
(144, 'Volvo Model Replicas, Co', 'Berglund', 'Christina', '0921-12 3555', 'Berguvsvägen 8', NULL, 'Luleå', NULL, 'S-958 22', 'Sweden', 1166, 71800.00),
(145, 'Danish Wholesale Imports', 'Petersen', 'Jytte', '31 12 3555', 'Vinbæltet 34', NULL, 'Kobenhavn', NULL, '1734', 'Denmark', 140, 14000.00),

100 %
Messages
(20 rows affected)
Completion time: 2025-02-08T14:37:14.6196961+02:00
```

```
USE MotorsCertification
GO
--Re-enable the Foreign Key on customers
ALTER TABLE customers CHECK CONSTRAINT FK_customers_salesRep;
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-02-08T14:42:27.0974714+02:00

```
USE MotorsCertification
GO
--Disable the Foreign Key on orders
ALTER TABLE orders NOCHECK CONSTRAINT FK_orders_customer;
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-02-08T14:45:17.0720504+02:00

```
--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--Insert into orders
INSERT INTO orders (orderNumber, orderDate, requiredDate, shippedDate, status, comments, customerNumber)
VALUES
(10100, '2003-01-06', '2003-01-13', '2003-01-10', 'Shipped', NULL, 103),
(10101, '2003-01-09', '2003-01-18', '2003-01-11', 'Shipped', 'Check on availability.', 128),
(10102, '2003-01-10', '2003-01-18', '2003-01-14', 'Shipped', NULL, 181),
(10103, '2003-01-29', '2003-02-07', '2003-02-02', 'Shipped', NULL, 121),
(10104, '2003-01-31', '2003-02-09', '2003-02-01', 'Shipped', NULL, 141),
(10105, '2003-02-11', '2003-02-21', '2003-02-12', 'Shipped', NULL, 145),
(10106, '2003-02-17', '2003-02-24', '2003-02-21', 'Shipped', NULL, 278),
(10107, '2003-02-24', '2003-03-03', '2003-02-26', 'Shipped', 'Difficult to negotiate with customer. We need more marketing materials', 128),
(10108, '2003-03-03', '2003-03-12', '2003-03-08', 'Shipped', NULL, 385),
(10109, '2003-03-10', '2003-03-19', '2003-03-11', 'Shipped', 'Customer requested that FedEx Ground is used for this shipping', 486),
(10110, '2003-03-18', '2003-03-24', '2003-03-20', 'Shipped', NULL, 187),
(10111, '2003-03-25', '2003-03-31', '2003-03-30', 'Shipped', NULL, 129),
```

100 %

Messages

(20 rows affected)

Completion time: 2025-02-08T14:47:57.2802981+02:00

```
--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--Re-enable the Foreign Key on orders
ALTER TABLE orders CHECK CONSTRAINT FK_orders_customer;
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-02-08T14:50:47.5932290+02:00

```
--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--Disable Foreign Keys for orderdetails
ALTER TABLE orderdetails NOCHECK CONSTRAINT FK_orderdetails_orders;
ALTER TABLE orderdetails NOCHECK CONSTRAINT FK_orderdetails_products;
```

100 %
Messages

Commands completed successfully.
Completion time: 2025-02-08T14:53:48.2734490+02:00

```
--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--Insert into orderdetails
INSERT INTO orderdetails (orderNumber, productCode, quantityOrdered, priceEach, orderLineNumber)
VALUES
(10100, 'S18_1749', 30, 136.00, 3),
(10101, 'S18_2248', 50, 55.09, 2),
(10102, 'S18_4409', 22, 75.46, 4),
(10103, 'S24_3969', 49, 35.29, 1),
(10104, 'S18_2325', 25, 108.06, 4),
(10105, 'S18_2795', 26, 167.06, 1),
(10106, 'S24_1937', 45, 32.53, 3),
(10107, 'S24_2022', 46, 44.35, 2),
(10108, 'S18_1342', 39, 95.55, 2),
(10109, 'S18_1367', 41, 43.13, 1),
(10110, 'S10_1949', 26, 214.30, 11),
(10111, 'S10_4962', 42, 119.67, 4),
```

100 %
Messages

(20 rows affected)
Completion time: 2025-02-08T14:56:47.3345640+02:00

```
--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--Re-enable Foreign Keys for orderdetails
ALTER TABLE orderdetails CHECK CONSTRAINT FK_orderdetails_orders;
ALTER TABLE orderdetails CHECK CONSTRAINT FK_orderdetails_products;
```

100 %
Messages

Commands completed successfully.
Completion time: 2025-02-08T14:59:55.4989146+02:00

```
--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--Disable Foreign Key for payments
ALTER TABLE payments NOCHECK CONSTRAINT FK_payments_customers;
```

100 %
Messages

Commands completed successfully.
Completion time: 2025-02-08T15:02:37.7661161+02:00


```
--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--Insert into payments
INSERT INTO payments (customerNumber, checkNumber, paymentDate, amount)
VALUES
(101, 'HQ336336', '2004-10-19', 6066.78),
(102, 'JM555205', '2003-06-05', 14571.44),
(103, 'OM314933', '2004-12-18', 1676.14),
(104, 'B0864823', '2004-12-17', 14191.12),
(105, 'HQ55022', '2003-06-06', 32641.98),
(106, 'ND748579', '2004-08-20', 33347.88),
(107, 'GG31455', '2003-05-20', 45864.03),
(108, 'MA765515', '2004-12-15', 82261.22),
(109, 'NP603840', '2003-05-31', 7565.08),
(110, 'NR27552', '2004-03-10', 44894.74),
(111, 'DB933704', '2004-11-14', 19501.82),
(112, 'LN373447', '2004-08-08', 47924.19),
```

100 %

Messages

(20 rows affected)

Completion time: 2025-02-08T15:05:59.9656735+02:00

```
--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--Re-enable Foreign Key for payments
ALTER TABLE payments CHECK CONSTRAINT FK_payments_customers;
|
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-02-08T15:09:25.2121671+02:00

```
--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--Disable Foreign Key for products
ALTER TABLE products NOCHECK CONSTRAINT FK_products_productlines;
|
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-02-08T15:12:28.3146333+02:00

```
--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--Insert into products
INSERT INTO products (productCode, productName, productLine, productScale, productVendor, productDescription, quantityInStock, buyPr
VALUES
('S10_1678', '1969 Harley Davidson Ultimate Chopper', 'Motorcycles', '1:10', 'Min Lin Diecast', 'This replica features working kicks
('S10_1949', '1952 Alpine Renault 1300', 'Classic Cars', '1:10', 'Classic Metal Creations', 'Turnable front wheels; steering func
('S10_2016', '1996 Moto Guzzi 1100i', 'Motorcycles', '1:10', 'Highway 66 Mini Classics', 'Official Moto Guzzi logos and insignias, s
('S10_4698', '2003 Harley-Davidson Eagle Drag Bike', 'Motorcycles', '1:10', 'Red Start Diecast', 'Model features, official Harley Da
('S10_4757', '1972 Alfa Romeo GTA', 'Classic Cars', '1:10', 'Motor City Art Classics', 'Features include: Turnable front wheels; ste
('S10_4962', '1962 Lancia Delta 16V', 'Classic Cars', '1:10', 'Second Gear Diecast', 'Features include: Turnable front wheels; stee
('S12_1099', '1968 Ford Mustang', 'Classic Cars', '1:12', 'Autoart Studio Design', 'Hood, doors and trunk all open to reveal highly
('S12_1108', '2001 Ferrari Enzo', 'Classic Cars', '1:12', 'Second Gear Diecast', 'Turnable front wheels; steering function; detailed
('S12_1666', '1958 Setra Bus', 'Trucks and Buses', '1:12', 'Welly Diecast Productions', 'Model features 30 windows, skylights & glar
('S12_2823', '2002 Suzuki XRE0', 'Motorcycles', '1:12', 'Unimax Art Galleries', 'Official logos and insignias, saddle bags located o
('S12_3148', '1969 Corvair Monza', 'Classic Cars', '1:18', 'Welly Diecast Productions', '1:18 scale die-cast about 10" long doors op
('S12_3380', '1968 Dodge Charger', 'Classic Cars', '1:12', 'Welly Diecast Productions', '1:12 scale model of a 1968 Dodge Charger. H
```

100 %

Messages

(20 rows affected)

Completion time: 2025-02-08T15:15:05.0928577+02:00

```
--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--Re-enable Foreign Key for products
ALTER TABLE products CHECK CONSTRAINT FK_products_productlines;

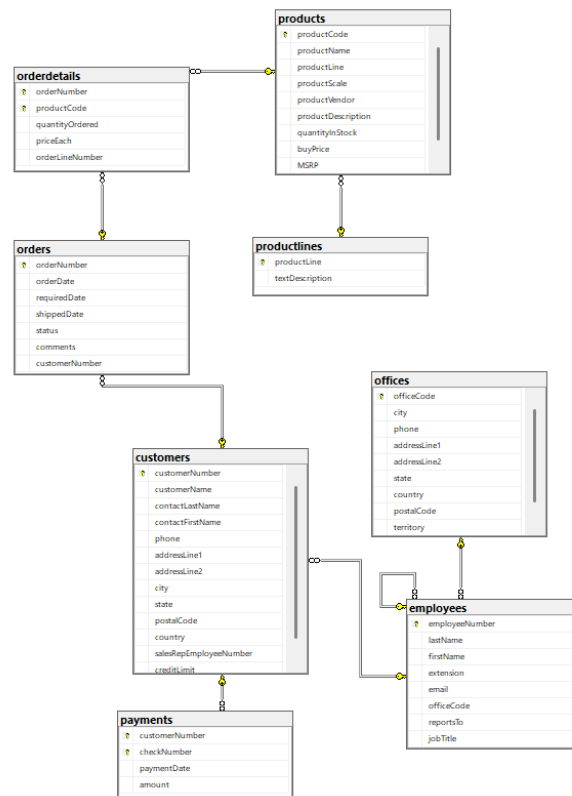
100 %
Messages
Commands completed successfully.
Completion time: 2025-02-08T15:17:25.5960336+02:00

--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--Insert into productlines
INSERT INTO productlines (productline, textDescription, htmlDescription, image)
VALUES
('Classic Cars', 'Attention car enthusiasts: Make your wildest car ownership dreams come true. These replicas feature superb attention to detail, making them a true collector's item.', NULL, NULL),
('Motorcycles', 'Our motorcycles are state of the art replicas of classic as well as contemporary motorcycle legends.', NULL, NULL),
('Planes', 'Unique, diecast airplane and helicopter replicas suitable for collections, as well as home, office or classroom decoration.', NULL, NULL),
('Ships', 'The perfect holiday or anniversary gift for executives, clients, friends, and family.', NULL, NULL),
('Trains', 'Model trains are a rewarding hobby for enthusiasts of all ages.', NULL, NULL),
('Trucks and Buses', 'The Truck and Bus models are realistic replicas of buses and specialized trucks.', NULL, NULL),
('Vintage Cars', 'Our Vintage Car models realistically portray automobiles produced from the early 1900s through the 1940s.', NULL, NULL);

100 %
Messages
(7 rows affected)
Completion time: 2025-02-08T15:20:18.0589841+02:00
```

Task 3

Below is the **ER Diagram** representing the relationships between these tables:



Explaining the ER Diagram:

The following are the connections between the tables:

Although a client may place more than one order, only one customer is associated with each order.

The order details table, which keeps track of quantity and pricing, allows each order to include numerous products.

personnel manage customer interactions and work in designated offices, as indicated by the personnel table's links to both offices and customers.

Customers and payments are connected, guaranteeing that every payment is associated with a legitimate consumer.

For a variety of business operations, this structure guarantees data integrity and effective query.

Task 4

Delete the columns in productlines which are useless that do not infer anything

ALTER TABLE productlines DROP COLUMN htmlDescription, image;

```
--USE THE MOTORSCERTIFICATION DATABASE.  
USE MotorsCertification  
GO  
ALTER TABLE productlines DROP COLUMN htmlDescription, image;  
  
--USE THE MOTORSCERTIFICATION DATABASE.  
USE MotorsCertification  
GO  
SELECT * FROM productlines;
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-02-08T15:36:04.6567055+02:00

100 %

Results Messages

	productLine	textDescription
1	Classic Cars	Attention car enthusiasts: Make your wildest car o...
2	Motorcycles	Our motorcycles are state of the art replicas of cla...
3	Planes	Unique, diecast airplane and helicopter replicas ...
4	Ships	The perfect holiday or anniversary gift for executiv...
5	Trains	Model trains are a rewarding hobby for enthusias...
6	Trucks and Buses	The Truck and Bus models are realistic replicas ...
7	Vintage Cars	Our Vintage Car models realistically portray auto...

Task 5

Use a select statement to verify all insertions as well as updates

SELECT * FROM customers;

SELECT * FROM employees;

SELECT * FROM orders;

SELECT * FROM orderdetails;

SELECT * FROM payments;

SELECT * FROM products;

SELECT * FROM productlines;

SELECT * FROM offices;

```
--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--VERIFY INSERTIONS & UPDATES USING SELECT STATEMENTS
SELECT * FROM customers;
SELECT * FROM employees;
SELECT * FROM orders;
SELECT * FROM orderdetails;
SELECT * FROM payments;
SELECT * FROM products;
SELECT * FROM productlines;
SELECT * FROM offices;
```

customerNumber	customerName	contactLastName	contactFirstName	phone	addressLine1	addressLine2	city	state	postalCode
103	Atelier graphique	Schmitt	Carine	40.32.2555	54, rue Royale	NULL	Nantes	NULL	44000
112	Signal Gift Stores	King	Jean	7025551838	8489 Strong St.	NULL	Las Vegas	NV	83030
114	Australian Collectors. Co.	Ferguson	Peter	03 9520 4555	636 St Kilda Road	Level 3	Melbourne	Victoria	3004
119	La Rochelle Gifts	Labruno	Janine	40 67 8555	67, rue des Cinquante Otages	NULL	Nantes	NULL	44000
121	Baane Mini Imports	Bergulfsen	Jonas	07-98 9555	Erling Stakkles gate 78	NULL	Stavern	NULL	4110
124	Mini Gifts Distributors Ltd.	Nelson	Susan	4155551450	5677 Strong St.	NULL	San Rafael	CA	97562
125	Haezel & Zbyszek Co.	Pietrzewicz	Zbyszek	(26) 642-7555	ul. Filtrów 68	NULL	Warszawa	NULL	01-012
128	Blauser See Auto. Co.	Keitel	Roland	+49 69 66 90 2555	Lyonenstr. 34	NULL	Frankfurt	NULL	60528

employeeNumber	lastName	firstName	extension	email	officeCode	reportsTo	jobTitle
1002	Murphy	Diane	x5800	dmurphy@classicmodelcars.com	1	NULL	President
1056	Patterson	Mary	x4611	mpatterson@classicmodelcars.com	1	1002	VP Sales
1076	Finelli	Jeff	x9273	jfinelli@classicmodelcars.com	1	1002	VP Marketing
1088	Patterson	William	x4871	wpatterson@classicmodelcars.com	6	1056	Sales Manager (APAC)
1102	Bondur	Gerard	x5408	gbondur@classicmodelcars.com	4	1056	Sales Manager (EM...)
1143	Bow	Anthony	x5428	abow@classicmodelcars.com	1	1056	Sales Manager (NA)

orderNumber	orderDate	requiredDate	shippedDate	status	comments	customerNumber
10100	2003-01-06	2003-01-13	2003-01-10	Shipped	NULL	103
10101	2003-01-09	2003-01-18	2003-01-11	Shipped	Check on availability.	128
10102	2003-01-10	2003-01-18	2003-01-14	Shipped	NULL	161
10103	2003-01-29	2003-02-07	2003-02-02	Shipped	NULL	121
10104	2003-01-31	2003-02-09	2003-02-01	Shipped	NULL	141
10105	2003-02-11	2003-02-21	2003-02-12	Shipped	NULL	145
10106	2003-02-17	2003-02-24	2003-02-21	Shipped	NULL	278
10107	2003-02-24	2003-03-03	2003-02-26	Shipped	Difficult to negotiat...	131

orderNumber	productCode	quantityOrdered	priceEach	orderLineNumber
10100	S18_1749	30	136	3
10101	S18_2248	50	55.09	2
10102	S18_4409	22	75.46	4
10103	S24_3969	49	35.29	1
10104	S18_2325	25	108.06	4
10105	S18_2795	26	167.06	1
10106	S24_1937	45	32.53	3

	customerNumber	checkNumber	paymentDate	amount					
1	101	HO338336	2004-10-19	6066.78					
2	102	JM555205	2003-06-05	14571.44					
3	103	OM314933	2004-12-18	1676.14					
4	104	BO864823	2004-12-17	14191.12					
5	105	HO55022	2003-06-06	32641.98					
6	106	NO748579	2004-08-20	33347.88					
7	107	GG31455	2003-05-20	45864.03					
8	108	MA765515	2004-12-15	82261.22					

	productCode	productName	productLine	productScale	productVendor	productDescription	quantityInStock	buyPrice	MSRP
1	S10_1678	1969 Harley Davidson Ultimate Chopper	Motorcycles	1:10	Min Lin Diecast	This replica features working kickstand, front su...	7933	48.81	95.7
2	S10_1949	1952 Alpine Renault 1300	Classic Cars	1:10	Classic Metal Creations	Turnable front wheels; steering function; detail...	7305	98.58	214.3
3	S10_2016	1996 Moto Guzzi 1100i	Motorcycles	1:10	Highway 66 Mini Clas...	Official Moto Guzzi logos and insignias, saddle...	6625	68.99	118....
4	S10_4698	2003 Harley-Davidson Eagle Drag Bike	Motorcycles	1:10	Red Start Diecast	Model features, official Harley Davidson logos ...	5582	91.02	193....
5	S10_4757	1972 Alfa Romeo GTA	Classic Cars	1:10	Motor City Art Classics	Features include: Turnable front wheels; steeri...	3252	85.68	136
6	S10_4962	1962 Lancia Delta 16V	Classic Cars	1:10	Second Gear Diecast	Features include: Turnable front wheels; steeri...	6791	103.42	147....
7	S12_1099	1968 Ford Mustang	Classic Cars	1:12	Autoart Studio Design	Hood, doors and trunk all open to reveal highl...	68	95.34	194....

	productLine	textDescription
1	Classic Cars	Attention car enthusiasts: Make your wildest car...
2	Motorcycles	Our motorcycles are state of the art replicas of c...
3	Planes	Unique, diecast airplane and helicopter replica...
4	Ships	The perfect holiday or anniversary gift for execut...
5	Trains	Model trains are a rewarding hobby for enthusi...
6	Trucks and...	The Truck and Bus models are realistic replicas...
7	Vintage Cars	Our Vintage Car models realistically portray aut...

	officeCode	city	phone	addressLine1	addressLine2	state	country	postalCode	territory
1	1	San Francisco	+1 650 219 4782	100 Market Street	Suite 300	CA	USA	94080	NA
2	2	Boston	+1 215 837 0825	1550 Court Place	Suite 102	MA	USA	02107	NA
3	3	NYC	+1 212 555 3000	523 East 53rd S...	Apt. 5A	NY	USA	10022	NA
4	4	Paris	+33 14 723 4404	43 Rue Jouffroy ...	NULL	NU...	France	75017	EMEA
5	5	Tokyo	+81 33 224 5000	4-1 Kioicho	NULL	Chi...	Japan	102-8578	Japan
6	6	Sydney	+61 2 9264 2451	5-11 Wentworth ...	Floor #2	NU...	Austr...	NSW 2010	APAC
7	7	London	+44 20 7877 2...	25 Old Broad St...	Level 7	NU...	UK	EC2N 1HN	EMEA

Task 6

Find out the highest and the lowest amount.

SELECT

MAX(amount) AS Highest_Amount,

MIN(amount) AS Lowest_Amount

FROM payments;

```
--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
SELECT
    MAX(amount) AS Highest_Amount,
    MIN(amount) AS Lowest_Amount
FROM payments;
```


100 %

Results

Messages

	Highest_Amount	Lowest_Amount
1	101244.59	1491.38

Task 7

Give the unique count of customerName from customers

SELECT COUNT(DISTINCT customerName) AS Unique_Customers FROM customers;

```
--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--FIND UNIQUE CUSTOMER COUNT.
SELECT COUNT(DISTINCT customerName) AS Unique_Customers FROM customers;
```

100 %

Results Messages

Unique_Customers	
1	20

Task 8

Create a view from customers and payments named cust_payment and select customerName, amount, contactLastName, contactFirstName who have paid.

Create using view

CREATE VIEW cust_payment AS

SELECT

c.customerName,

p.amount,

c.contactLastName,

c.contactFirstName

FROM customers c

LEFT JOIN payments p ON c.customerNumber = p.customerNumber;

SELECT * FROM cust_payment;

```

USE MotorsCertification
GO
-- Create view paymnet
CREATE VIEW cust_payment AS
SELECT
    c.customerName,
    p.amount,
    c.contactLastName,
    c.contactFirstName
FROM customers c
LEFT JOIN payments p ON c.customerNumber = p.customerNumber;
SELECT * FROM cust_payment;

```

	customerName	amount	contactLastName	contactFirstName
1	Atelier graphique	1676.14	Schmitt	Carine
2	Signal Gift Stores	47924.19	King	Jean
3	Australian Collectors, Co.	50218.95	Ferguson	Peter
4	La Rochelle Gifts	85410.87	Labruno	Janine
5	Baane Mini Imports	NULL	Bergulfsen	Jonas
6	Mini Gifts Distributors Ltd.	NULL	Nelson	Susan
7	Havel & Zbyszek Co	NULL	Piestrzeniewicz	Zbyszek
8	Blauer See Auto, Co.	NULL	Keitel	Roland
9	Mini Wheels Co.	NULL	Murphy	Julie
10	Land of Toys Inc.	NULL	Lee	Kwai
11	Euro+ Shopping Channel	NULL	Freyre	Diego
12	Volvo Model Replicas, Co	NULL	Berglund	Christina
13	Danish Wholesale Imports	NULL	Petersen	Jytte
14	Saveley & Henriot, Co.	NULL	Saveley	Mary
15	Dragon Souvenirs, Ltd.	NULL	Natividad	Eric
16	Muscle Machine Inc	NULL	Young	Jeff

Drop views

DROP VIEW cust_payment;

```

USE MotorsCertification
GO
-- DROP THE VIEW
DROP VIEW cust_payment;

```

100 %

Messages

Commands completed successfully.

Completion time: 2025-02-08T16:38:51.3741548+02:00

Task 9

Create a stored procedure on products which displays productLine for Classic Cars.

CREATE PROCEDURE GetClassicCars

AS

BEGIN

SELECT

productCode,

productName,


```

productLine,

productScale,

productVendor,

productDescription,

quantityInStock,

buyPrice,

MSRP

FROM products

WHERE productLine = 'Classic Cars';

END;

--Run this procedure using:

EXEC GetClassicCars;

```

```

--USE THE MOTORCERTIFICATION DATABASE.
USE MotorCertification
GO
--CREATE A STORED PROCEDURE TO SHOW CLASSIC CARS
CREATE PROCEDURE GetClassicCars
AS
BEGIN
    SELECT
        productCode,
        productName,
        productLine,
        productScale,
        productVendor,
        productDescription,
        quantityInStock,
        buyPrice,
        MSRP
    FROM products
    WHERE productLine = 'Classic Cars';
END
--Run this procedure using:
EXEC GetClassicCars;

```

	productCode	productName	productLine	productScale	productVendor	productDescription	quantityInStock	buyPrice	MSRP
1	S10_1949	1952 Alpine Renault 1300	Classic Cars	1:10	Classic Metal Creations	Turnable front wheels; steering function; detailed int...	7305	90.58	214.3
2	S10_4757	1972 Alfa Romeo GTA	Classic Cars	1:10	Motor City Art Classics	Features include: Turnable front wheels; steering fu...	3252	85.68	138
3	S10_4962	1962 Lancia Delta 16V	Classic Cars	1:10	Second Gear Diecast	Features include: Turnable front wheels; steering fu...	6791	103.42	147.74
4	S12_1099	1968 Ford Mustang	Classic Cars	1:12	Autostart Studio Design	Hood, doors and trunk all open to reveal highly detai...	68	95.34	194.57
5	S12_1108	2001 Ferrari Enzo	Classic Cars	1:12	Second Gear Diecast	Turnable front wheels; steering function; detailed int...	3619	95.59	207.8
6	S12_3148	1969 Corvair Monza	Classic Cars	1:18	Welly Diecast Productions	1:18 scale die-cast about 10" long doors open, hood...	6906	89.14	151.08
7	S12_3380	1968 Dodge Charger	Classic Cars	1:12	Welly Diecast Productions	1:12 scale model of a 1968 Dodge Charger. Hood, d...	9123	75.16	117.44
8	S12_3891	1969 Ford Falcon	Classic Cars	1:12	Second Gear Diecast	Turnable front wheels; steering function; detailed int...	1049	83.05	173.02
9	S12_3990	1970 Plymouth Hemi Cuda	Classic Cars	1:12	Studio M Art Models	Very detailed 1970 Plymouth Cuda model in 1:12 sc...	5663	31.92	79.8
10	S12_4675	1969 Dodge Charger	Classic Cars	1:12	Welly Diecast Productions	Detailed model of the 1969 Dodge Charger. This m...	7323	58.73	115.16
11	S18_1129	1993 Mazda RX-7	Classic Cars	1:18	Highway 66 Mini Classics	This model features opening hood, opening doors, ...	3975	83.51	141.54

Task 10

Create a function to get the creditLimit of customers less than 96800

CREATE FUNCTION GetLowCreditCustomers()

RETURNS TABLE

AS

RETURN

```
(
    SELECT * FROM customers WHERE creditLimit < 96800
);

SELECT * FROM GetLowCreditCustomers();
```

The screenshot shows a SQL Server Enterprise Manager interface. The top pane displays a query window with the following SQL code:

```
USE MotorsCertification
GO
--CREATE A FUNCTION TO GET CUSTOMERS WITH CREDITLIMIT < 96800
CREATE FUNCTION GetLowCreditCustomers()
RETURNS TABLE
AS
RETURN
(
    SELECT * FROM customers WHERE creditLimit < 96800
);
--Run the function using:
SELECT * FROM GetLowCreditCustomers();
```

The bottom pane shows the results of the function execution as a table with 12 columns: customerNumber, customerName, contactLastName, contactFirstName, phone, addressLine1, addressLine2, city, state, postalCode, country, and salesRep. The results are as follows:

customerNumber	customerName	contactLastName	contactFirstName	phone	addressLine1	addressLine2	city	state	postalCode	country	salesRep
103	Atelier graphique	Schmitt	Carine	40.32.2555	54, rue Royale	NULL	Nantes	NULL	44000	France	1370
112	Signal Gift Stores	King	Jean	7025551838	8489 Strong St.	NULL	Las Vegas	NV	83030	USA	1166
121	Baane Mini Imports	Bergulfsen	Jonas	07-98 9555	Erling Skakkes gate 78	NULL	Stavern	NULL	4110	Norway	1504
125	Havel & Zbyszek Co	Piestrzeniewicz	Zbyszek	(26) 642-7555	ul. Filtrów 68	NULL	Warszawa	NULL	01-012	Poland	NULL
128	Blauer See Auto, Co.	Kettel	Roland	+49 69 66 90 2555	Lyonerstr. 34	NULL	Frankfurt	NULL	60528	Germany	1504
129	Mini Wheels Co.	Murphy	Julie	6505555787	5557 North Pendale Street	NULL	San Francisco	CA	94217	USA	1165
144	Volvo Model Replicas, Co	Berglund	Christina	0921-12 3555	Berguvägen 8	NULL	Luleå	NULL	S-958 22	Sweden	1504
145	Danish Wholesale Imports	Petersen	Jytte	31 12 3555	Vindbæltet 34	NULL	København	NULL	1734	Denmark	1401
161	Technics Stores Inc.	Hashimoto	Juni	6505556809	9408 Furth Circle	NULL	Burlingame	CA	94217	USA	1165

Task 11

Create Trigger to store transaction record for employee table which displays employeeNumber, lastName, FirstName and office code upon insertion

CREATE TRIGGER EmployeeTransactionLog

ON employees

AFTER INSERT

AS

BEGIN

 SELECT employeeNumber, lastName, firstName, officeCode FROM inserted;

END;

INSERT INTO employees (employeeNumber, lastName, firstName, extension, email, officeCode, reportsTo, jobTitle)

VALUES (2001, 'Smith', 'John', 'x1234', 'jsmith@classicmodelcars.com', 1, 1002, 'Sales Rep');

```
USE MotorsCertification
GO
--CREATE A TRIGGER TO STORE TRANSACTIONS ON EMPLOYEES
CREATE TRIGGER EmployeeTransactionLog
ON employees
AFTER INSERT
AS
BEGIN
    SELECT employeeNumber, lastName, firstName, officeCode FROM inserted;
END;

INSERT INTO employees (employeeNumber, lastName, firstName, extension, email, officeCode, reportsTo, jobTitle)
VALUES (2001, 'Smith', 'John', 'x1234', 'jsmith@classicmodelcars.com', 1, 1002, 'Sales Rep');
```

00 %

Results Messages

	employeeNumber	lastName	firstName	officeCode
1	2001	Smith	John	1

Task 12

Create a Trigger to display customer number if the amount is greater than 10,000

CREATE TRIGGER HighValuePayment

ON payments

AFTER INSERT

AS

BEGIN

SELECT customerNumber FROM inserted WHERE amount > 10000;

END;

INSERT INTO payments (customerNumber, checkNumber, paymentDate, amount)

VALUES (103, 'CHK99999', '2025-02-08', 15000.00);

```

USE MotorsCertification
GO
--CREATE A TRIGGER TO SHOW CUSTOMER NUMBER IF AMOUNT > 10,000
CREATE TRIGGER HighValuePayment
ON payments
AFTER INSERT
AS
BEGIN
    SELECT customerNumber FROM inserted WHERE amount > 10000;
END;
INSERT INTO payments (customerNumber, checkNumber, paymentDate, amount)
VALUES (103, 'CHK99999', '2025-02-08', 15000.00);

```

00 %

Results Messages

	customerNumber
1	103

Task 13

Create Users, Roles and Logins according to 3 Roles: Admin, HR, and Employee. Admin can view full database and has full access, HR can view and access only employee and offices table. Employee can view all tables only. Note: work from Admin role for any changes to be made for database

User Roles & Security

The following are the defined roles and permissions:

~Admin- Full access

~HR- Access to employees and offices table

~Employee- Read only access

--CREATE USERS, ROLES, AND LOGINS -- Create logins CREATE LOGIN AdminUser WITH PASSWORD = 'ProfHope91#'; CREATE LOGIN HRUser WITH PASSWORD = 'Hope91_ss'; CREATE LOGIN EmployeeUser WITH PASSWORD = '1991Hp#_!';

-- Create database users CREATE USER AdminUser FOR LOGIN AdminUser; CREATE USER HRUser FOR LOGIN HRUser; CREATE USER EmployeeUser FOR LOGIN EmployeeUser;

-- Create roles CREATE ROLE AdminRole; CREATE ROLE HRRole; CREATE ROLE EmployeeRole;

-- Grant permissions GRANT CONTROL ON DATABASE::MotorsCertification TO AdminRole;
-- Full access GRANT SELECT, INSERT, UPDATE, DELETE ON employees TO HRRole;
GRANT SELECT, INSERT, UPDATE, DELETE ON offices TO HRRole; -- HR access GRANT
SELECT ON SCHEMA::dbo TO EmployeeRole; -- Employees can only view tables

-- Assign users to roles ALTER ROLE AdminRole ADD MEMBER AdminUser; ALTER ROLE
HRRole ADD MEMBER HRUser; ALTER ROLE EmployeeRole ADD MEMBER EmployeeUser;

```
--USE THE MOTORSCERTIFICATION DATABASE.
USE MotorsCertification
GO
--CREATE USERS, ROLES, AND LOGINS
-- Create logins
CREATE LOGIN AdminUser WITH PASSWORD = 'ProfHope91#';
CREATE LOGIN HRUser WITH PASSWORD = 'Hope91_ss';
CREATE LOGIN EmployeeUser WITH PASSWORD = '1991Hp#_!';

-- Create database users
CREATE USER AdminUser FOR LOGIN AdminUser;
CREATE USER HRUser FOR LOGIN HRUser;
CREATE USER EmployeeUser FOR LOGIN EmployeeUser;

-- Create roles
CREATE ROLE AdminRole;
CREATE ROLE HRRole;
CREATE ROLE EmployeeRole;

-- Grant permissions
GRANT CONTROL ON DATABASE::MotorsCertification TO AdminRole; -- Full access
GRANT SELECT, INSERT, UPDATE, DELETE ON employees TO HRRole;
GRANT SELECT, INSERT, UPDATE, DELETE ON offices TO HRRole; -- HR access
GRANT SELECT ON SCHEMA::dbo TO EmployeeRole; -- Employees can only view tables

-- Assign users to roles
ALTER ROLE AdminRole ADD MEMBER AdminUser;
ALTER ROLE HRRole ADD MEMBER HRUser;
ALTER ROLE EmployeeRole ADD MEMBER EmployeeUser;
```