

Data Warehouse

-Creation

-ETL Process

-Using Star Schema

Database:

WonderfulWheels

Datawarehouse:

WonderfulWheelsDW

Step1: Create Data Warehouse:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left displays the database structure of 'WonderfulWheels'. The main query window contains the following SQL script:

```
-- PROG8400 LAB7
-- GROUP:MIC
-- GROUP MEMBERS: KEYAO WANG, YUHANG LI, YAZHENG GUO.

-- Step1: CREATE DATA WAREHOUSE: WonderfulWheelsDW
USE master
GO

IF DB_ID(N'WonderfulWheelsDW') IS NOT NULL
    DROP DATABASE WonderfulWheelsDW;
GO

CREATE DATABASE WonderfulWheelsDW
GO
```

The Results pane at the bottom shows the output of the query, which is a table with 3 rows and 12 columns: EmployeeSK, EmployeeAK, FirstName, LastName, Email, DateofBirth, Title, HireDate, EmpRole, Commission, ManagerID, ExpirationDate, and LoadDate. The status bar at the bottom indicates 'Query executed successfully'.

EmployeeSK	EmployeeAK	FirstName	LastName	Email	DateofBirth	Title	HireDate	EmpRole	Commission	ManagerID	ExpirationDate	LoadDate
1	1002	Tracy	Spencer	tspencer@email.com	1998-07-22	Ms	2022-07-12 15:08:58.257	Sales	13	1000	NULL	2022-07-28 13:21:14.247
2	1003	James	Stewart	jstewart@email.com	1996-11-22	Mr	2022-07-12 15:08:58.257	Sales	15	1000	NULL	2022-07-28 13:21:14.247
3	1004	Paul	Newman	pnewman@email.com	1992-09-23	Mr	2022-07-12 15:08:58.257	Sales	10	1000	NULL	2022-07-28 13:21:14.247

Step2: ETL into table Dim_CommissionEmployee

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left displays the database structure of 'WonderfulWheelsDW'. The main query window contains the following SQL script:

```
USE WonderfulWheels
GO

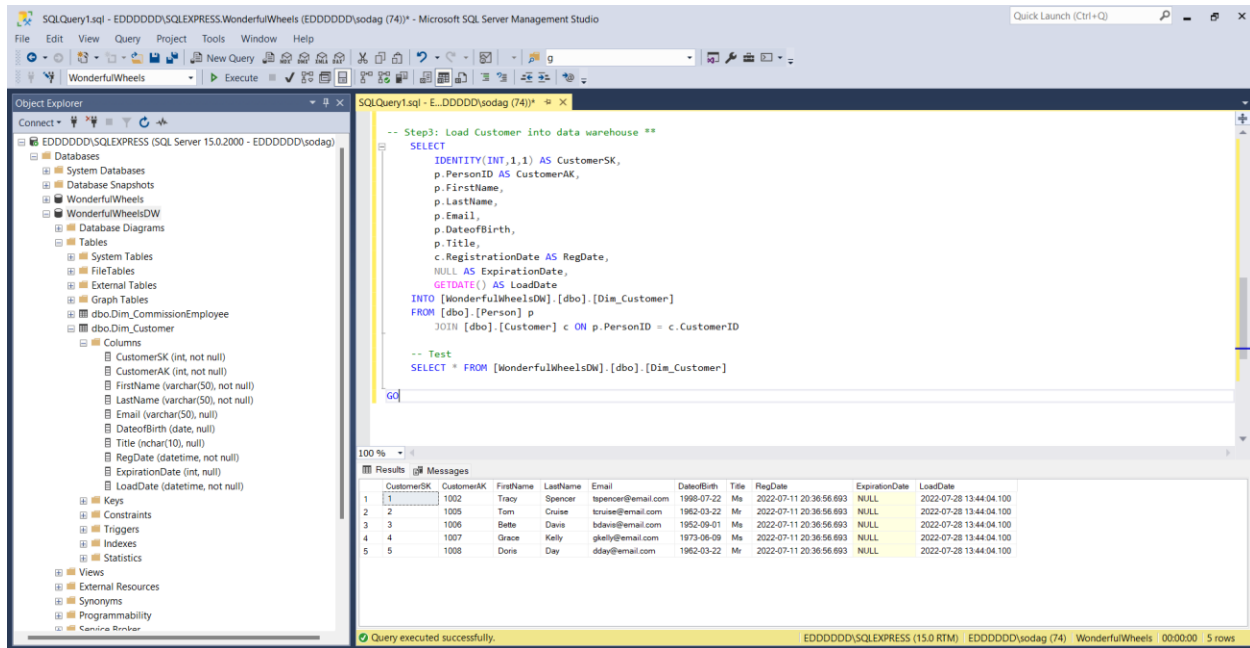
-- Step2: Load CommissionEmployee into data warehouse **
SELECT
    IDENTITY(int,1,1) AS EmployeeSK,
    p.PersonID AS EmployeeAK,
    p.FirstName,
    p.LastName,
    p.Email,
    p.DateofBirth,
    p.Title,
    e.HireDate,
    e.[Role] AS EmpRole,
    ce.Commission,
    e.ManagerID,
    NULL AS ExpirationDate,
    GETDATE() AS LoadDate
INTO [WonderfulWheelsDW].[dbo].[Dim_CommissionEmployee]
FROM [dbo].[Person] p
JOIN [dbo].[Employee] e ON p.PersonID = e.EmployeeID
JOIN [dbo].[CommissionEmployee] ce ON e.EmployeeID = ce.EmployeeID

--Test
SELECT * FROM [WonderfulWheelsDW].[dbo].[Dim_CommissionEmployee]
GO
```

The Results pane at the bottom shows the output of the query, which is a table with 3 rows and 12 columns: EmployeeSK, EmployeeAK, FirstName, LastName, Email, DateofBirth, Title, HireDate, EmpRole, Commission, ManagerID, ExpirationDate, and LoadDate. The status bar at the bottom indicates 'Query executed successfully'.

EmployeeSK	EmployeeAK	FirstName	LastName	Email	DateofBirth	Title	HireDate	EmpRole	Commission	ManagerID	ExpirationDate	LoadDate
1	1002	Tracy	Spencer	tspencer@email.com	1998-07-22	Ms	2022-07-12 15:08:58.257	Sales	13	1000	NULL	2022-07-28 13:21:14.247
2	1003	James	Stewart	jstewart@email.com	1996-11-22	Mr	2022-07-12 15:08:58.257	Sales	15	1000	NULL	2022-07-28 13:21:14.247
3	1004	Paul	Newman	pnewman@email.com	1992-09-23	Mr	2022-07-12 15:08:58.257	Sales	10	1000	NULL	2022-07-28 13:21:14.247

Step3: Load Customer into data warehouse.



SQLQuery1.sql - EDDDDDD\SQLEXPRESS.WonderfulWheels (EDDDDD\usodag (74)) - Microsoft SQL Server Management Studio

Object Explorer: EDDDDDD\SQLEXPRESS (SQL Server 15.0.2000 - EDDDDDD\usodag)

Query Window: SQLQuery1.sql - EDDDDDD\usodag (74)

```
-- Step3: Load Customer into data warehouse **
SELECT
    IDENTITY(INT,1,1) AS CustomerSK,
    p.PersonID AS CustomerAK,
    p.FirstName,
    p.LastName,
    p.Email,
    p.DateOfBirth,
    p.Title,
    c.RegistrationDate AS RegDate,
    NULL AS ExpirationDate,
    GETDATE() AS LoadDate
INTO [WonderfulWheelsDW].[dbo].[Dim_Customer]
FROM [dbo].[Person] p
JOIN [dbo].[Customer] c ON p.PersonID = c.CustomerID

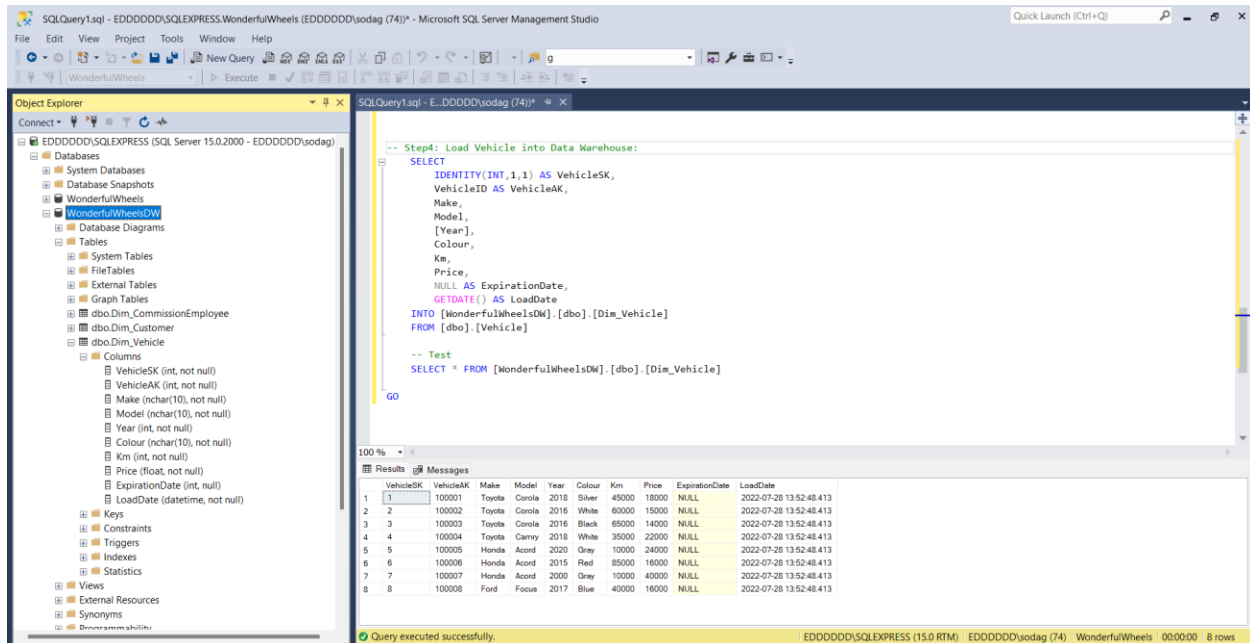
-- Test
SELECT * FROM [WonderfulWheelsDW].[dbo].[Dim_Customer]
GO
```

Results: Messages

	CustomerSK	CustomerAK	FirstName	LastName	Email	DateOfBirth	Title	RegDate	ExpirationDate	LoadDate
1	1	1002	Tracy	Spencer	tspencer@email.com	1998-07-22	Ms	2022-07-11 20:36:56.693	NULL	2022-07-28 13:44:04.100
2	2	1005	Tom	Cruise	tcruise@email.com	1962-03-22	Mr	2022-07-11 20:36:56.693	NULL	2022-07-28 13:44:04.100
3	3	1006	Bette	Davis	bdavis@email.com	1952-09-01	Ms	2022-07-11 20:36:56.693	NULL	2022-07-28 13:44:04.100
4	4	1007	Kelly	ghilly@email.com	1973-06-09	Ms	2022-07-11 20:36:56.693	NULL	2022-07-28 13:44:04.100	
5	5	1008	Dora	Day	dday@email.com	1962-03-22	Mr	2022-07-11 20:36:56.693	NULL	2022-07-28 13:44:04.100

Query executed successfully. EDDDDDD\SQLEXPRESS (15.0 RTM) EDDDDDD\usodag (74) WonderfulWheels 00:00:00 5 rows

Step4: Load Vehicle into Data Warehouse:



SQLQuery1.sql - EDDDDDD\SQLEXPRESS.WonderfulWheels (EDDDDD\usodag (74)) - Microsoft SQL Server Management Studio

Object Explorer: EDDDDDD\SQLEXPRESS (SQL Server 15.0.2000 - EDDDDDD\usodag)

Query Window: SQLQuery1.sql - EDDDDDD\usodag (74)

```
-- Step4: Load Vehicle into Data Warehouse:
SELECT
    IDENTITY(INT,1,1) AS VehicleSK,
    VehicleID AS VehicleAK,
    Make,
    Model,
    [Year],
    Colour,
    Km,
    Price,
    NULL AS ExpirationDate,
    GETDATE() AS LoadDate
INTO [WonderfulWheelsDW].[dbo].[Dim_Vehicle]
FROM [dbo].[Vehicle]

-- Test
SELECT * FROM [WonderfulWheelsDW].[dbo].[Dim_Vehicle]
GO
```

Results: Messages

	VehicleSK	VehicleAK	Make	Model	Year	Colour	Km	Price	ExpirationDate	LoadDate
1	1	100001	Toyota	Corolla	2018	Silver	45000	18000	NULL	2022-07-28 13:52:48.413
2	2	100002	Toyota	Corolla	2016	White	60000	15000	NULL	2022-07-28 13:52:48.413
3	3	100003	Toyota	Corolla	2016	Black	65000	14000	NULL	2022-07-28 13:52:48.413
4	4	100004	Toyota	Camry	2018	White	35000	22000	NULL	2022-07-28 13:52:48.413
5	5	100005	Honda	Accord	2020	Gray	10000	24000	NULL	2022-07-28 13:52:48.413
6	6	100006	Honda	Accord	2015	Red	85000	16000	NULL	2022-07-28 13:52:48.413
7	7	100007	Honda	Accord	2000	Gray	10000	40000	NULL	2022-07-28 13:52:48.413
8	8	100008	Ford	Focus	2017	Blue	40000	16000	NULL	2022-07-28 13:52:48.413

Query executed successfully. EDDDDDD\SQLEXPRESS (15.0 RTM) EDDDDDD\usodag (74) WonderfulWheels 00:00:00 8 rows

Step5: Load Dealership into Data warehouse:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left displays the database structure for 'WonderfulWheels'. The main query window contains the following SQL script:

```
GO

-- Step5: Load Dealership into Data warehouse:
SELECT
    IDENTITY(INT,1,1) AS DealershipSK,
    d.DealershipID AS DealershipAK,
    1.StreetAddress,
    1.City,
    1.Province,
    1.PostalCode,
    NULL AS ExpirationDate,
    GETDATE() AS LoadDate
INTO [WonderfulWheelsDW].[dbo].[Dim_Dealership]
FROM [dbo].[Location] 1
JOIN [dbo].[Dealership] d ON 1.[LocationID] = d.[LocationId]

-- Test
SELECT * FROM [WonderfulWheelsDW].[dbo].[Dim_Dealership]

GO
```

The Results pane at the bottom shows the output of the test query, displaying 3 rows of dealership data:

DealershipSK	DealershipAK	StreetAddress	City	Province	PostalCode	ExpirationDate	LoadDate
1	1	221 King St W	Kitchener	Ontario	G8B3C6	NULL	2022-07-28 14:07:35.177
2	2	77 Victoria St N	Cambridge	Ontario	N1Z8B8	NULL	2022-07-28 14:07:35.177
3	3	100 White Oak Rd	London	Ontario	L9B1W2	NULL	2022-07-28 14:07:35.177

The status bar at the bottom indicates: "Query executed successfully. EDDDDDD\SQLEXPRESS (15.0 RTM) EDDDDDD\usodag (74) WonderfulWheels 00:00:00 3 rows".

Step6: Create Fact Table: Fact_Sales.

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left displays the database structure for 'WonderfulWheels'. The main query window contains the following SQL script:

```
-- Step6: Create Fact Table: Fact_Sales.
SELECT
    o.OrderID,
    IDENTITY(INT,1,1) AS OrderItemId,
    EmployeeSK,
    CustomerSK,
    VehicleSK,
    DealershipSK,
    oi.FinalSalePrice,
    o.OrderDate AS OrderDateSK,
    oi.FinalSalePrice * ce.Commission AS Commission
INTO [WonderfulWheelsDW].[dbo].[Fact_Sales]
FROM [dbo].[Order] o
-- LEFT JOIN [dbo].[Employee] e ON o.OidEmpID = e.EmployeeID
-- LEFT JOIN [dbo].[Dealership] d ON o.OidDealID = d.DealershipID
-- LEFT JOIN [dbo].[Customer] c ON o.OidCusID = c.CustomerID
-- LEFT JOIN [dbo].[OrderItem] oi ON o.OrderID = oi.OrderID
-- LEFT JOIN [dbo].[Vehicle] v ON oi.VehicleID = v.VehicleID
-- Join to Dimensions to get SKs:
JOIN [WonderfulWheelsDW].[dbo].[Dim_CommissionEmployee] ce ON o.OidEmpID = EmployeeAK
JOIN [WonderfulWheelsDW].[dbo].[Dim_Customer] ON o.OidCusID = CustomerAK
JOIN [WonderfulWheelsDW].[dbo].[Dim_Vehicle] ON oi.VehicleID = VehicleAK
JOIN [WonderfulWheelsDW].[dbo].[Dim_Dealership] ON o.OidDealID = DealershipAK

-- Test
SELECT * FROM [WonderfulWheelsDW].[dbo].[Fact_Sales]

GO
```

The Results pane at the bottom shows the output of the test query, displaying 4 rows of fact sales data:

OrderID	OrderItemId	EmployeeSK	CustomerSK	VehicleSK	DealershipSK	FinalSalePrice	OrderDateSK	Commission
1	102	1	2	1	1	15000	2022-07-11	225000
2	100	2	1	2	1	17900	2022-07-11	227500
3	100	3	1	2	4	21000	2022-07-11	273000
4	101	4	1	3	8	15000	2022-07-11	195000

The status bar at the bottom indicates: "Query executed successfully. EDDDDDD\SQLEXPRESS (15.0 RTM) EDDDDDD\usodag (74) WonderfulWheels 00:00:00 4 rows".

[illegible]

The screenshot displays the Microsoft SQL Server Management Studio interface. The title bar indicates the current database is 'WonderfulWheelsDW'. The menu bar includes File, Edit, View, Project, Table Designer, Tools, Window, and Help. The toolbar shows various SQL operations like New Query, Execute, and Refresh. The Object Explorer on the left shows the database structure, including tables, views, and columns. The main area shows a data warehouse diagram with the following tables and relationships:

- Fact Sales** (Fact Table):
 - OrderID (PK)
 - OrderItemID
 - EmployeeSK
 - CustomerSK
 - VehicleSK
 - DealershipSK
 - FinalSalePrice
 - OrderDateSK
 - Commission
- Dim CommissionEmployee** (Dimension Table):
 - EmployeeSK (PK)
 - EmployeeAK
 - FirstName
 - LastName
 - Email
 - DateofBirth
 - Title
 - HireDate
 - EmpRole
 - Commission
 - ManagerID
 - ExpirationDate
 - LoadDate
- Dim Dealership** (Dimension Table):
 - DealershipSK (PK)
 - DealershipAK
 - StreetAddress
 - City
 - Province
 - PostalCode
 - ExpirationDate
 - LoadDate
- Dim Customer** (Dimension Table):
 - CustomerSK (PK)
 - CustomerAK
 - FirstName
 - LastName
 - Email
 - DateofBirth
 - Title
 - RegDate
 - ExpirationDate
 - LoadDate
- Dim Vehicle** (Dimension Table):
 - VehicleSK (PK)
 - VehicleAK
 - Make
 - Model
 - Year
 - Colour
 - Km
 - Price
 - ExpirationDate
 - LoadDate

The diagram shows relationships between the fact table and the dimension tables. Fact Sales is connected to Dim CommissionEmployee, Dim Dealership, Dim Customer, and Dim Vehicle. The relationships are one-to-many, with Fact Sales being the primary side and the dimension tables being the secondary side.