

DataBase Assignment: Sample Database

Northwind Database

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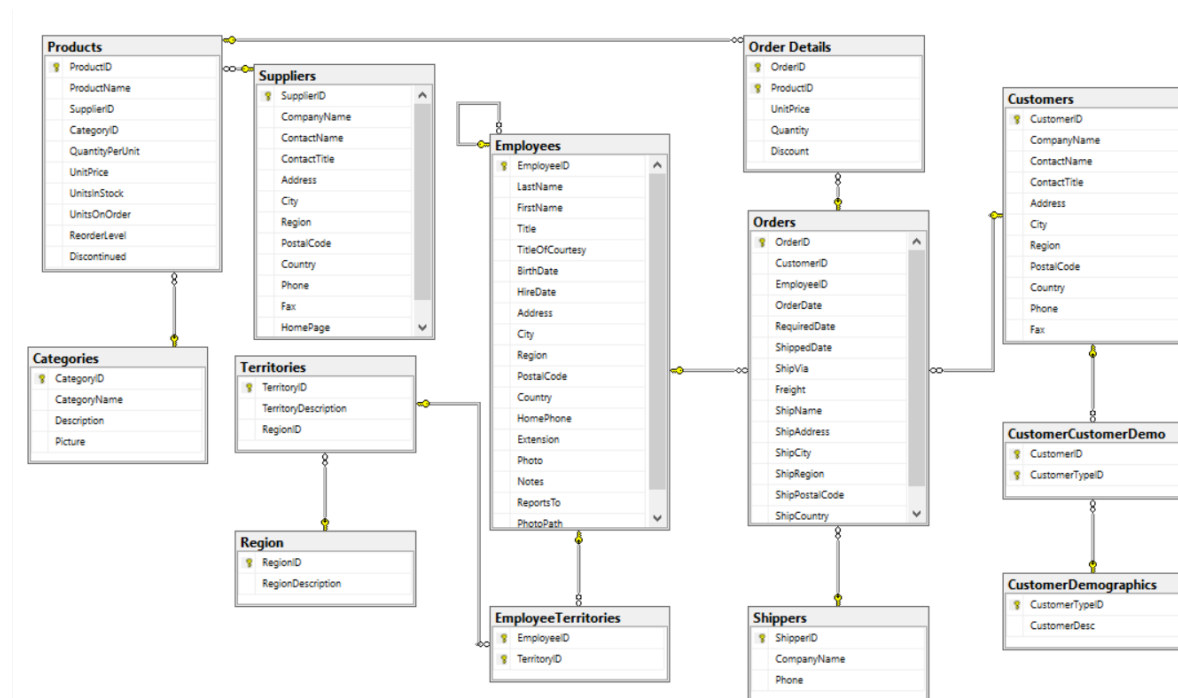
1. Source

<https://www.microsoft.com/en-us/download/confirmation.aspx?id=23654&fbclid=IwAR3Cfpmgon5qRKLASvcqyFe3W-ZRRIMVQMH0GueKxgopFLk-KcDtS2hFEp4>

2. Database description

Northwind database is a database about a company named Northwind Traders. In this database, there is stored information about the sales transaction that occurs between the company and its customers and the purchase transactions between the company and its suppliers. The information about the database refers to the products they are supplied with and which they sell, the suppliers, the customers, the orders and all the details about those orders. Moreover, we have information about their employees and their working territories and regions.

3. Database Diagram



4. Tables

Suppliers: companies which supply the products to the Northwind company and details such as the contact name, address, city, region, postal code, country and phone number.

SupplierID	CompanyName	ContactName	ContactTitle	Address	City	Region	PostalCode	Country	Phone	Fax	HomePage
1	Exotic Liquids	Charlotte Cooper	Purchasing Ma...	49 Gilbert St.	London	NULL	EC1 4SD	UK	(171) 555-2222	NULL	NULL
2	New Orleans C...	Shelley Burke	Order Administ...	P.O. Box 78934	New Orleans	LA	70117	USA	(100) 555-4822	NULL	#CAJUN.HTM#
3	Grandma Kelly'...	Regina Murphy	Sales Represent...	707 Oxford Rd.	Ann Arbor	MI	48104	USA	(313) 555-5735	(313) 555-3349	NULL
4	Tokyo Traders	Yoshi Nagase	Marketing Man...	9-8 Sekimai Mu...	Tokyo	NULL	100	Japan	(03) 3555-5011	NULL	NULL
5	Cooperativa de ...	Antonio del Vall...	Export Adminis...	Calle del Rosal 4	Oviedo	Asturias	33007	Spain	(98) 598 76 54	NULL	NULL
6	Mayumi's	Mayumi Ohno	Marketing Repr...	92 Setsuko Chu...	Osaka	NULL	545	Japan	(06) 431-7877	NULL	Mayumi's (on t...
7	Pavlova, Ltd.	Ian Devling	Marketing Man...	74 Rose St. Mo...	Melbourne	Victoria	3058	Australia	(03) 444-2343	(03) 444-6588	NULL
8	Specialty Biscui...	Peter Wilson	Sales Represent...	29 King's Way	Manchester	NULL	M14 GSD	UK	(161) 555-4448	NULL	NULL

Customers: companies which buy from the Northwind company and details such as contact name, city, region, posta code, country, phone number.

CustomerID	CompanyName	ContactName	ContactTitle	Address	City	Region	PostalCode	Country	Phone	Fax
ALFKI	Alfreds Futterki...	Maria Anders	Sales Represent...	Obere Str. 57	Berlin	NULL	12209	Germany	030-0074321	030-0076545
ANATR	Ana Trujillo Em...	Ana Trujillo	Owner	Avda. de la Con...	México D.F.	NULL	05021	Mexico	(5) 555-4729	(5) 555-3745
ANTON	Antonio Moren...	Antonio Moreno	Owner	Mataderos 2312	México D.F.	NULL	05023	Mexico	(5) 555-3932	NULL
AROUT	Around the Horn	Thomas Hardy	Sales Represent...	120 Hanover Sq.	London	NULL	WA1 1DP	UK	(171) 555-7788	(171) 555-6750
BERGS	Berglunds snab...	Christina Bergl...	Order Administ...	Berguvsvägen 8	Luleå	NULL	S-958 22	Sweden	0921-12 34 65	0921-12 34 67
BLAUS	Blauer See Delik...	Hanna Moos	Sales Represent...	Forsterstr. 57	Mannheim	NULL	68306	Germany	0621-08460	0621-08924
BLONP	Blondesddsl pè...	Frédérique Cite...	Marketing Man...	24, place Kléber	Strasbourg	NULL	67000	France	88.60.15.31	88.60.15.32
BOLID	Bólide Comida...	Martin Sommer	Owner	C/ Araquil, 67	Madrid	NULL	28023	Spain	(91) 555 22 82	(91) 555 91 99
BONAP	Bon app'	Laurence Lebih...	Owner	12, rue des Bou...	Marseille	NULL	13008	France	91.24.45.40	91.24.45.41
BOTTM	Bottom-Dollar ...	Elizabeth Lincoln	Accounting Ma...	23 Tsawassen Bl...	Tsawassen	BC	T2F 8M4	Canada	(604) 555-4729	(604) 555-3745

Employee: people who work for the company and details such as their name, date of birth, date of hiring and their addresses.

EmployeeID	LastName	FirstName	Title	TitleOfCourtesy	BirthDate	HireDate	Address	City	Region	PostalCode	Country
1	Davolio	Nancy	Sales Represent...	Ms.	1948-12-08 00:0...	1992-05-01 00:0...	507 - 20th Ave. ...	Seattle	WA	98122	USA
2	Fuller	Andrew	Vice President, ...	Dr.	1952-02-19 00:0...	1992-08-14 00:0...	908 W. Capital ...	Tacoma	WA	98401	USA
3	Leverling	Janet	Sales Represent...	Ms.	1963-08-30 00:0...	1992-04-01 00:0...	722 Moss Bay B...	Kirkland	WA	98033	USA
4	Peacock	Margaret	Sales Represent...	Mrs.	1937-09-19 00:0...	1993-05-03 00:0...	4110 Old Redm...	Redmond	WA	98052	USA
5	Buchanan	Steven	Sales Manager	Mr.	1955-03-04 00:0...	1993-10-17 00:0...	14 Garrett Hill	London	NULL	SW1 8JR	UK
6	Suyama	Michael	Sales Represent...	Mr.	1963-07-02 00:0...	1993-10-17 00:0...	Coventry Hous...	London	NULL	EC2 7JR	UK

Categories: the categories of products of the company with a description and a picture.

CategoryID	CategoryName	Description	Picture
1	Beverages	Soft drinks, coff...	<Binary data>
2	Condiments	Sweet and savo...	<Binary data>
3	Confections	Desserts, candi...	<Binary data>
4	Dairy Products	Cheeses	<Binary data>
5	Grains/Cereals	Breads, cracker...	<Binary data>
6	Meat/Poultry	Prepared meats	<Binary data>
7	Produce	Dried fruit and ...	<Binary data>
8	Seafood	Seaweed and fish	<Binary data>

Regions: regions in the country where the employees are working.

RegionID	RegionDescription
1	Eastern ...
2	Western ...
3	Northern ...
4	Southern ...

Territories: the territories which belong to every region.

TerritoryID	TerritoryDescri...	RegionID
01581	Westboro ...	1
01730	Bedford ...	1
01833	Georgetow ...	1
02116	Boston ...	1
02139	Cambridge ...	1
02184	Braintree ...	1
02903	Providence ...	1
03049	Hollis ...	3
03801	Portsmouth ...	3
06897	Wilton ...	1
07960	Morristown ...	1
08837	Edison ...	1
10019	New York ...	1
10038	New York ...	1

EmployeeTerritories: the employees of the company and their working territories

EmployeeID	TerritoryID
1	06897
1	19713
2	01581
2	01730
2	01833
2	02116
2	02139
2	02184
2	40222
3	30346
3	31406

Orders: all the orders from the customers of the Northwind company, such as the id of the customer which made the order, the date of the order, the id of the shipping company, and the addresses of the orders.

OrderID	CustomerID	EmployeeID	OrderDate	RequiredDate	ShippedDate	ShipVia	Freight	ShipName	ShipAddress	ShipCity	ShipRegion
10248	VINET	5	1996-07-04 00:00:00	1996-08-01 00:00:00	1996-07-16 00:00:00	3	32.3800	Vins et alcools ...	59 rue de l'Abb...	Reims	NULL
10249	TOMSP	6	1996-07-05 00:00:00	1996-08-16 00:00:00	1996-07-10 00:00:00	1	11.6100	Toms Spezialit...	Luisenstr. 48	Münster	NULL
10250	HANAR	4	1996-07-08 00:00:00	1996-08-05 00:00:00	1996-07-12 00:00:00	2	65.8300	Hanari Carnes	Rua do Paço, 67	Rio de Janeiro	RJ
10251	VICTE	3	1996-07-08 00:00:00	1996-08-05 00:00:00	1996-07-15 00:00:00	1	41.3400	Victuailles en st...	2, rue du Com...	Lyon	NULL
10252	SUPRD	4	1996-07-09 00:00:00	1996-08-06 00:00:00	1996-07-11 00:00:00	2	51.3000	Suprêmes délices	Boulevard Tiro...	Charleroi	NULL
10253	HANAR	3	1996-07-10 00:00:00	1996-07-24 00:00:00	1996-07-16 00:00:00	2	58.1700	Hanari Carnes	Rua do Paço, 67	Rio de Janeiro	RJ
10254	CHOPS	5	1996-07-11 00:00:00	1996-08-08 00:00:00	1996-07-23 00:00:00	2	22.9800	Chop-suey Chi...	Hauptstr. 31	Bern	NULL
10255	RICSU	9	1996-07-12 00:00:00	1996-08-09 00:00:00	1996-07-15 00:00:00	3	148.3300	Richter Superm...	Starenweg 5	Genève	NULL

Order Details: more details for the above orders, such as price per unit, quantity and the discount.

OrderID	ProductID	UnitPrice	Quantity	Discount
10248	11	14.0000	12	0
10248	42	9.8000	10	0
10248	72	34.8000	5	0
10249	14	18.6000	9	0
10249	51	42.4000	40	0
10250	41	7.7000	10	0
10250	51	42.4000	35	0.15
10250	65	16.8000	15	0.15
10251	22	16.8000	6	0.05
10251	57	15.6000	15	0.05

Shippers: the companies that ship the products from Northwind to their customers.

ShipperID	CompanyName	Phone
1	Speedy Express	(503) 555-9831
2	United Package	(503) 555-3199
3	Federal Shipping	(503) 555-9931

Products: all the products of the company and their details, such as the name of the product, the id of the supplier, the quantity per unit, the price per unit, the units in stock etc.

ProductID	ProductName	SupplierID	CategoryID	QuantityPerUnit	UnitPrice	UnitsInStock	UnitsOnOrder	ReorderLevel	Discontinued
1	Chai	1	1	10 boxes x 20 b...	18.0000	39	0	10	False
2	Chang	1	1	24 - 12 oz bottles	19.0000	17	40	25	False
3	Aniseed Syrup	1	2	12 - 550 ml bott...	10.0000	13	70	25	False
4	Chef Anton's C...	2	2	48 - 6 oz jars	22.0000	53	0	0	False
5	Chef Anton's G...	2	2	36 boxes	21.3500	0	0	0	True
6	Grandma's Boy...	3	2	12 - 8 oz jars	25.0000	120	0	25	False
7	Uncle Bob's Or...	3	7	12 - 1 lb pkgs.	30.0000	15	0	10	False

5. Primary keys

- EmployeeID: primary key used to uniquely identify each employee of the Northwind company
- OrderID: primary key used to uniquely identify each order of the Northwind company
- ShipperID: primary key used to uniquely identify each shipping company
- TerritoryID: primary key used to uniquely identify each territory in which the Northwind company activates
- CategoryID: primary key used to uniquely identify each category of products of the company

6. Foreign keys

- CustomerID: foreign key in the table Orders, pointing to the table Customers; used to identify the customer that made the order
- ShipVia: foreign key in the table Orders, pointing to the table Shippers; used to identify the company which ships the products
- ReportsTo: foreign key in the table Employees, pointing also to the table employees; used to identify the employee to which every employee reports
- CategoryID: foreign key in the table Products, pointing to the table Category; used to identify the category which each product belongs to

8. Relationships:

We have **one-to-many** relationships:

- Between the tables Categories and Products: **CategoryID** (primary key) from Categories and **CategoryID** (foreign key) from Products; there can be more products of a category but a product cannot belong to multiple categories
- Between the tables Orders and Customers: CustomerID(primary key) from Customers and CustomerID (foreign key) from Orders; there can be more orders made by a customer but there cannot be an order made by multiple customers
- Between the table Employees and itself: **EmployeeID** (primary key) and **ReportsTo** (foreign key); an employee reports to a single other employee, but an employee can get reports from multiple employees

We have **many-to-many** relationships:

- Between the tables Employees and EmployeeTerritories: EmployeeID is the primary key for both of the tables; an employee can work in multiple territories, and in every territory can work multiple employees

9. Views

1. I made a view to show me the orders from September 1996, ordered by the name of the category.

```
SELECT      dbo.Categories.CategoryName,
            dbo.Products.ProductName,
            SUM(CONVERT(money, (dbo.[Order Details].UnitPrice * dbo.[Order Details].Quantity) * (1 - dbo.[Order Details].Discount) / 100) * 100) AS ProductSales
FROM        dbo.Categories INNER JOIN
            dbo.Products ON dbo.Categories.CategoryID = dbo.Products.CategoryID INNER JOIN
            dbo.Orders INNER JOIN
            dbo.[Order Details] ON dbo.Orders.OrderID = dbo.[Order Details].OrderID ON dbo.Products.ProductID = dbo.[Order Details].ProductID
WHERE       (dbo.Orders.ShippedDate BETWEEN '1996-09-01' AND '1996-09-30')
GROUP BY    dbo.Categories.CategoryName, dbo.Products.ProductName
ORDER BY    dbo.Categories.CategoryName
```

	CategoryName	ProductName	ProductSales
1	Beverages	Chai	259.20
2	Beverages	Chang	608.00
3	Beverages	Chartreuse verte	864.00
4	Beverages	Guaraná Fantástica	79.20
5	Beverages	Ipoh Coffee	552.00
6	Beverages	Outback Lager	300.00
7	Beverages	Rhönbräu Klosterbier	260.40
8	Condiments	Chef Anton's Gumbo Mix	340.00
9	Condiments	Gula Malacca	334.80
10	Condiments	Louisiana Fiery Hot Pepper Sauce	453.60
11	Condiments	Louisiana Hot Spiced Okra	408.00
12	Condiments	Original Frankfurter grüne Soße	104.00
13	Condiments	Vegie-spread	175.50
14	Confections	Maxilaku	720.00
15	Confections	Pavlova	556.00
16	Confections	Scottish Longbreads	392.00
17	Confections	Sir Rodney's Marmalade	1296.00
18	Confections	Tarte au sucre	1182.00

2. A view to show me all the order subtotals.

```
SELECT      dbo.[Order Details].OrderID,
            SUM(CONVERT(money, (dbo.[Order Details].UnitPrice * dbo.[Order Details].Quantity) * (1 - dbo.[Order Details].Discount) / 100) * 100) AS Subtotal,
            dbo.Products.ProductName
FROM        dbo.[Order Details] INNER JOIN
            dbo.Products ON dbo.[Order Details].ProductID = dbo.Products.ProductID
GROUP BY    dbo.[Order Details].OrderID, dbo.Products.ProductName
```

OrderID	Subtotal	ProductName
10265	936.0000	Alice Mutton
10279	351.0000	Alice Mutton
10294	468.0000	Alice Mutton
10302	1248.0000	Alice Mutton
10319	249.6000	Alice Mutton
10338	624.0000	Alice Mutton
10339	2074.8000	Alice Mutton
10346	1010.8800	Alice Mutton
10415	62.4000	Alice Mutton
10430	1123.2000	Alice Mutton
10431	1170.0000	Alice Mutton
10444	312.0000	Alice Mutton
10523	877.5000	Alice Mutton
10530	1560.0000	Alice Mutton
10550	280.8000	Alice Mutton
10564	592.8000	Alice Mutton
10573	702.0000	Alice Mutton

3. A view to show me the quantity of each product that hasn't been discontinued.

```
SELECT    dbo.Categories.CategoryName, SUM(dbo.Products.UnitsInStock) AS Quantity
FROM      dbo.Categories INNER JOIN
          dbo.Products ON dbo.Categories.CategoryID = dbo.Products.CategoryID
WHERE     (dbo.Products.Discontinued <> 'True')
GROUP BY  dbo.Categories.CategoryName
```

CategoryName	Expr1
Beverages	539
Condiments	507
Confections	386
Dairy Products	393
Grains/Cereals	282
Meat/Poultry	136
Produce	74
Seafood	701

4. A view to show me all the discontinued products:

```
SELECT    ProductID, ProductName
FROM      dbo.Products AS Product_List
WHERE     (Discontinued = 'True')
```


ProductID	ProductName
5	Chef Anton's G...
9	Mishi Kobe Niku
17	Alice Mutton
24	Guaraná Fantás...
28	Rössle Sauerkraut
29	Thüringer Rost...
42	Singaporean H...
53	Perth Pasties

10. Constraints:

I would propose a lot of constraints about some attributes to allow only digits and expressions (not allow letters in phone numbers), some examples being from the table Customers (Phone, Fax) and the same attributes from other tables, and from the table Employees(HomePhone).

Also, the HireDate from the Employees table should be a valid date (not before the company Northwind was founded e.g. not '1682-01-01').

11. Migration

I migrated my database from SQL Server to MySQL Workbench:

The screenshot displays the MySQL Workbench interface. The left sidebar shows the 'SCHEMAS' panel with a tree view of the database structure, including tables like 'categories', 'customers', 'employees', and 'orders'. The main window shows a query result for the 'orders' table. The query is 'SELECT * FROM northwind.orders;'. The result grid shows columns: OrderID, CustomerID, EmployeeID, OrderDate, RequiredDate, ShippedDate, ShipVia, Freight, ShipName, and ShipAddress. The bottom status bar indicates '8 row(s) returned' and '0.031 sec / 0.000 sec'.

OrderID	CustomerID	EmployeeID	OrderDate	RequiredDate	ShippedDate	ShipVia	Freight	ShipName	ShipAddress
10248	VINET	5	1996-07-04 00:00:00.000000	1996-08-01 00:00:00.000000	1996-07-16 00:00:00.000000	3	32.3800	Vins et alcools Chevalier	59 rue de l'abbaye
10249	TOMSP	6	1996-07-05 00:00:00.000000	1996-08-16 00:00:00.000000	1996-07-10 00:00:00.000000	1	11.6100	Toms Spezialitäten	Luisenstr. 48
10250	HANAR	4	1996-07-08 00:00:00.000000	1996-08-05 00:00:00.000000	1996-07-12 00:00:00.000000	2	65.8300	Hanari Carnes	Rua do Paço, 67
10251	VICTE	3	1996-07-08 00:00:00.000000	1996-08-05 00:00:00.000000	1996-07-15 00:00:00.000000	1	41.3400	Victualles en stock	2, rue du Commerce
10252	SUPRD	4	1996-07-09 00:00:00.000000	1996-08-06 00:00:00.000000	1996-07-11 00:00:00.000000	2	51.3000	Suprêmes délices	Boulevard Tirou, 255
10253	HANAR	3	1996-07-10 00:00:00.000000	1996-07-24 00:00:00.000000	1996-07-16 00:00:00.000000	2	58.1700	Hanari Carnes	Rua do Paço, 67
10254	CHOPS	5	1996-07-11 00:00:00.000000	1996-08-08 00:00:00.000000	1996-07-23 00:00:00.000000	2	22.9800	Chop-suey Chinese	Hauptstr. 31
10255	RICSU	9	1996-07-12 00:00:00.000000	1996-08-09 00:00:00.000000	1996-07-15 00:00:00.000000	3	148.3300	Richter Supermarkt	Starenweg 5
10256	WELLI	3	1996-07-15 00:00:00.000000	1996-08-12 00:00:00.000000	1996-07-17 00:00:00.000000	2	13.9700	Wellington Importadora	Rua do Mercado, 12
10257	HILAA	4	1996-07-16 00:00:00.000000	1996-08-13 00:00:00.000000	1996-07-22 00:00:00.000000	3	81.9100	HILARION-Abastos	Carrera 22 con Ave. Carlos Soublette #8-35
10258	ERNGH	1	1996-07-17 00:00:00.000000	1996-08-14 00:00:00.000000	1996-07-23 00:00:00.000000	1	140.5100	Ernst Handel	Kirchgasse 6
10259	CENTC	4	1996-07-18 00:00:00.000000	1996-08-15 00:00:00.000000	1996-07-25 00:00:00.000000	3	3.2500	Centro comercial Moctez...	Sierras de Granada 9993
10260	OTTIK	4	1996-07-19 00:00:00.000000	1996-08-16 00:00:00.000000	1996-07-29 00:00:00.000000	1	55.0900	Ottiles Kasseladen	Mehrheimerstr. 369
10261	QUEDE	4	1996-07-19 00:00:00.000000	1996-08-16 00:00:00.000000	1996-07-30 00:00:00.000000	2	3.0500	Que Delícia	Rua da Panificadora, 12
10262	RATTC	8	1996-07-22 00:00:00.000000	1996-08-19 00:00:00.000000	1996-07-25 00:00:00.000000	3	48.2900	Rattlesnake Canyon Gr...	2817 Milton Dr.
10263	ERNGH	9	1996-07-23 00:00:00.000000	1996-08-20 00:00:00.000000	1996-07-31 00:00:00.000000	3	146.0600	Ernst Handel	Kirchgasse 6
10264	POLOK	6	1996-07-24 00:00:00.000000	1996-08-21 00:00:00.000000	1996-08-23 00:00:00.000000	3	3.6700	Folk och fa Hø	Åkergratan 24
10265	BLOPP	2	1996-07-25 00:00:00.000000	1996-08-22 00:00:00.000000	1996-08-12 00:00:00.000000	1	55.2800	Blondel père et fils	24, place Kléber
10266	WARTH	3	1996-07-26 00:00:00.000000	1996-09-06 00:00:00.000000	1996-07-31 00:00:00.000000	3	25.7300	Wartian Herku	Tonkivu 38