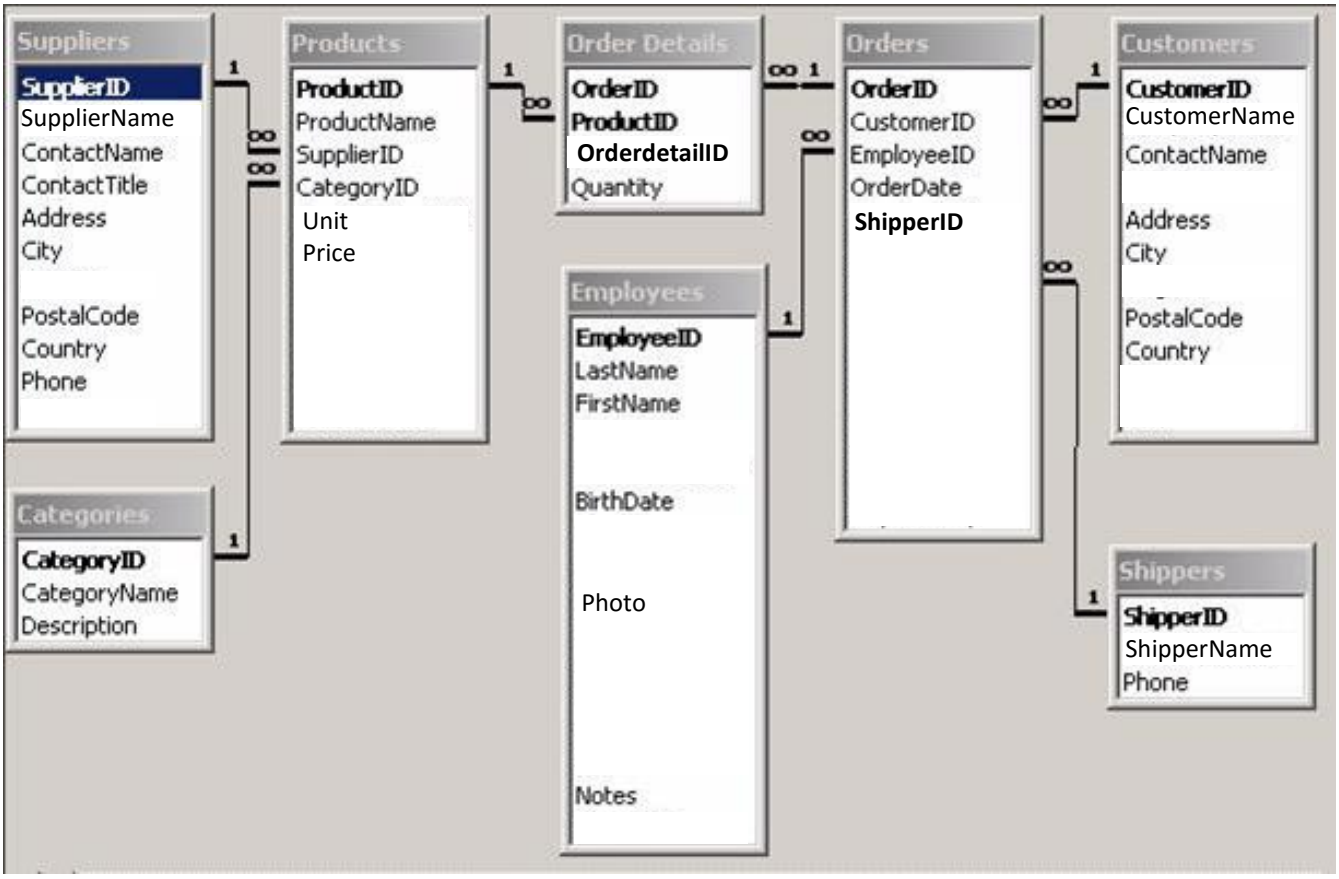
Northwind Database

We are going to use Northwind Database to practice basic SQL skills. The full database and its description are available at this site. In order to use the full database, you need to install Microsoft SQL server. However, in this course, you do not have to use this software and the full database. We are going to use part of this database on w3schools.

The following is the data model (or schema, relationship) for this database. From this, you can see all the attributes in each table and the relationship among those tables.



Notes

- There is no space between the words “Order” and “Details” in the name of the OrderDetails table.
- In order to keep the number of attributes in each table and the name of attribute in this data model identical to that on w3schools, I revised the data model above a little bit. That is why you see some blank areas in the data model.

The tables and attributes in each table are described as below.

Tables & Attributes

Suppliers- A table which stores all information regarding the suppliers who supply the products

- **SupplierID:** Number that uniquely identifies each supplier. PK (Primary Key) of this table
- **SupplierName:** Name of this supplier company
- **ContactName:** Specific employee's name at this company who is Northwinds' contact
- **Address:** The street address of this supplier
- **City:** The city location of this supplier
- **Postal Code:** The postal code for this supplier's address
- **Country:** The country this supplier is located in
- **Phone:** The phone number for this supplier.

Categories- This table lists and describes all the different categories each product can be in

- **CategoryID:** A number PK that uniquely identifies each Category
- **CategoryName:** Name or title of each category
- **Description:** Brief description of what types of products can be included in the category

Products- a table to show all of the products that Northwind sells. It includes general information about the product as well as information regarding Northwind's inventory levels for the product

- **ProductID:** A number PK that uniquely identifies each product
- **ProductName:** The name the product goes by
- **SupplierID:** A FK (Foreign Key) to show which supplier this product came from
- **CategoryID:** A FK to show which category this product is in
- **Unit**: the number of individual items that come in each unit of the product. For example, 12 8oz jars or 10 boxes of 20 bags.
- **Price**: The retail price that Northwinds currently lists per unit

OrderDetails- A table that shows all the details about Northwind's orders.

- **OrderDetailID:** A number PK that uniquely identifies each orderdetail
- **OrderID:** A FK that shows which order this is associated with
- **ProductID:** A FK that shows which product is on the order
- **Quantity:** the number of units of this product purchased on this order

Employees- Table that shows all of the Northwind employees as well as each employee's background & company related information.

- **EmployeeID:** A number PK that uniquely identifies each employee
- **LastName:** The last name of the employee
- **FirstName:** The first name of the employee
- **BirthDate:** The employee's date of birth. In the format DD-MMM-YY
- **Photo:** employee photo file
- **Notes:** a brief bio of the employee that includes their degree, certificates, and history with the company

Orders- Table shows all of the Northwind orders and related information.

- **OrderID:** The Primary Key that uniquely identifies each order.
- **CustomerID:** The FK that uniquely describes each customer.
- **EmployeeID:** A number FK that uniquely describes each employee.
- **OrderDate:** Date the order was placed.
- **ShipperID:** The FK that identifies the shipping company that shipped the order.

Customers- table that displays information for each company who is a customer of Northwinds

- **CustomerID:** The Primary Key that uniquely identifies each customer
- **CompanyName:** The name or title of the company
- **ContactName:** Name of the employee at the company who is Northwinds contact
- **Address:** Street address of the company
- **City:** City location of the company
- **PostalCode:** Postal code for the company's location
- **Country:** Country of the company

Shippers-A table that stores all of the companies who ship Northwinds products

- **ShipperID:** a number Primary Key that uniquely identifies each shipper
- **ShipperName:** Name or title of the shipping company
- **Phone:** Phone number of the shipping company

Business Rules

- Each supplier supplies many products, but each product is supplied by 1 supplier
- Each category contains many products, but each product can only be in 1 category
- Each product can be in many order details, but each order detail can have 1 product
- Each order detail can only be in 1 order, but each order can have many order details
- Each employee can take many orders, but each order is taken by 1 employee
- Each order can only be placed 1 customer, but each customer can place many orders
- Each order can only be shipped by 1 shipper, but each shipper can ship many orders

Here is the general format for an SQL SELECT statement:

```
SELECT column1[,column2]
FROM table1
[JOIN table2 ON table1.fieldq = table2.fieldr]
[JOIN table3 ON table2.fieldx = table3.fieldy] etc.
[WHERE "conditions"]
[GROUP BY "column-list"]
[HAVING "conditions"]
[ORDER BY "column-list" [ASC | DESC]]
```

Here is a table of comparison operators and aggregate functions:

=	Equal
>, <	Greater than, Less than
>=, <=	Greater than or equal to, Less than or equal to
<> or !=	Not equal to
BETWEEN	Determines whether a value is between two stated endpoints (included in the range)
LIKE	String comparison test
IN	Determines whether a value is in the list that follows
MIN	returns the smallest value in a given column
MAX	returns the largest value in a given column
SUM	returns the sum of the numeric values in a given column
AVG	returns the average value of a given column
COUNT	returns the total number of values in a given column
COUNT(*)	returns the number of rows in a table

Here is a table that shows some uses of the to_char function:

to_char(fieldname[1], 'mm/dd/yy')	Returns date in mm/dd/yy format (e.g., '03/26/12')
to_char(fieldname, 'mm/dd/yyyy')	Returns date in mm/dd/yyyy format (e.g., '03/26/2012')
to_char(fieldname, 'mm')	Returns two-digit month of the date (e.g., '03')
to_char(fieldname, 'yyyy')	Returns four-digit year of the date (e.g., '2012')
to_char(fieldname, '$999,999.99')	Returns amount formatted as dollars and cents (e.g., '$123,456.78'). Length of string based on number of 9's.

Here is a table that shows some uses of the to_date function:

to_date('2003/07/09','yyyy/mm/dd')	Returns a date value of July 9, 2003
to_date('070903,'mmddyy')	Returns a date value of July 9, 2003
to_date('20020315','yyyymmdd')	Returns a date value of March 15, 2002

[1] "Fieldname" means the name of a field in the database – e.g., orderdate.