DSO 552: SQL Databases for Business Analysts

Midterm Exam (Exam 1)

Note: Make sure to submit your answers by the deadline. Late submissions will not be accepted. Also make sure * your column names match the sample output * you do not `LIMIT 5` unless the question directly asks you to do so

Northwind Traders Company

Northwind Traders is a company that imports and exports food globally. The database captures all the sales transactions that occurs between the company i.e. Northwind traders and its customers as well as the purchase transactions between Northwind and its suppliers.

The following explains each table (used in this assignment) in the Northwind database:

Table	Description
Customers	who buy from Northwind
Orders	stores transaction sale orders from customers
OrderDetails	stores line items of sale orders
Products	the products that Northwind trades in
Suppliers	who supply to the company
Shippers	details of the shippers who ship the products from the traders to the end-customers
Employees	who work for Northwind

Check Figure 1 (on the last page) for more details for each of the above tables.

Make sure that you are logged in as your own personal user and that you save all objects into your own personal schema (the same as your username).

1. ***(1 point)*** **Identify all products that are not discontinued but are out of stock.**

```
select c.categoryname, p.supplierid, unitsinstock AS remainingunits
from products p
JOIN categories c ON p.categoryid = c.categoryid
where discontinued = 0 AND unitsinstock = 0 order by unitprice desc;
```

Expected:

categoryname	supplierid	remainingunits
Dairy Products	14	0

2. ***(1 point)*** **Generate a report that contains the 5 most recent orders placed at Northwind, the employees that processed those orders, and the names of the customers.**

```
SELECT e.firstname || ' ' || e.lastname AS employeename,
o.orderid, o.orderdate, c.companyname AS customername
FROM orders o
```

```
JOIN employees e ON e.employeeid = o.employeeid
JOIN customers c ON c.customerid = o.customerid
ORDER BY 3 DESC LIMIT 5;
```

Expected:

employeename	orderid	orderdate	customername
Margaret Peacock	11076	1998-05-06	Bon app'
Nancy Davolio	11077	1998-05-06	Rattlesnake Canyon Grocery
Robert King	11074	1998-05-06	Simons bistro
Laura Callahan	11075	1998-05-06	Richter Supermarkt
Andrew Fuller	11073	1998-05-05	Pericles Comidas clásicas

3. ***(1 point)*** **Identify all customers who have made less than 5 orders.**

```
SELECT customerid, companyname, contactname, contacttitle
FROM customers WHERE customerid IN (
SELECT customerid
FROM orders o
GROUP BY 1
HAVING COUNT(*) < 5)
LIMIT 5;
```

Expected:

customerid	companyname	contactname	contacttitle
ANATR	Ana Trujillo Emparedados y helados	Ana Trujillo	Owner
BOLID	Bólido Comidas preparadas	Martín Sommer	Owner
CENTC	Centro comercial Moctezuma	Francisco Chang	Marketing Manager
CONSH	Consolidated Holdings	Elizabeth Brown	Sales Representative
DUMON	Du monde entier	Janine Labrune	Owner

4. ***(1 point)*** **Produce a report that shows the number of nonactive customers per country. A non-active customer is defined as a customer that has never ordered from us.**

```
SELECT country, COUNT(*) AS nonactive_customers
FROM (
SELECT *
FROM customers c
LEFT JOIN orders o ON o.customerid = c.customerid
WHERE o.employeeid IS NULL) nonactive_customers
GROUP BY 1;
```

Expected:

country	nonactive_customers
France	1
Spain	1

5. ***(1 point)*** **Show the number of products that are in stock (where `unitsinstock` is greater than 0) and have a unit price greater than 20 for each category.**

```
SELECT c.categoryname, COUNT(*) AS number_of_products
FROM products p
JOIN categories c ON p.categoryid = c.categoryid
```

```
WHERE unitsinstock > 0 AND unitprice > 20
GROUP BY c.categoryname
```

Expected:

categoryname	number_of_products
Beverages	2
Produce	4
Condiments	6
Grains/Cereals	3
Meat/Poultry	2
Confections	4
Dairy Products	8
Seafood	4

6. ***(1 point)*** **How many customers have ordered a seafood product from Northwind?**

```
SELECT COUNT(DISTINCT customerid) AS num_customers
FROM orders o
JOIN order_details od ON o.orderid = od.orderid
JOIN products p ON od.productid = p.productid
JOIN categories c ON p.categoryid = c.categoryid
WHERE c.categoryname = 'Seafood'
```

Expected:

num_customers
85

7. ***(1 point)*** **Produce a report that shows how many employees are managed by each of the managers at Northwind. Hint - the employee that a worker reports to is listed in the `reportsto` column.**

```
SELECT e2.firstname || ' ' || e2.lastname AS managername, COUNT(*) AS num_of_employees_managed
FROM employees e1
JOIN employees e2 ON e1.reportsto = e2.employeeid
GROUP BY 1
```

Expected:

managername	num_of_employees_managed
Steven Buchanan	3
Andrew Fuller	5

8. ***(1 point)*** **Excluding our Vice President of Sales, show the top 3 employees in terms of total sales order value (`unitprice * quantity`). List the results in descending order.**

```
SELECT e.employeeid, e.firstname || ' ' || e.lastname AS employeename, SUM(od.unitprice * od.quantity) A
FROM orders o
JOIN order_details od ON od.orderid = o.orderid
JOIN employees e ON e.employeeid = o.employeeid
WHERE e.title <> 'Vice President, Sales'
GROUP BY 1,2
ORDER BY 3 DESC LIMIT 3;
```

Expected:

employeeid	employeename	total_ordered_value
4	Margaret Peacock	250187.5
3	Janet Leverling	213051.3
1	Nancy Davolio	202143.7

9. ***(1 point)*** **Produce a report showing each customer's name and the total number of orders they have placed, as well as the number of orders fulfilled on time. An on time order is one where `shippeddate` is before `requireddate`. Show the results with the customers with the most orders first.**

```
SELECT c.companyname,
(SELECT COUNT(*) FROM orders WHERE customerid = c.customerid) AS total_orders,
COUNT(DISTINCT o.orderid) AS on_time_orders
FROM customers c
JOIN orders o ON c.customerid = o.customerid
WHERE o.shippeddate < o.requireddate
GROUP BY 1,2
ORDER BY 2 DESC
LIMIT 5
```

Expected:

companyname	total_orders	on_time_orders
Save-a-lot Markets	31	30
Ernst Handel	30	28
QUICK-Stop	28	25
Folk och fä HB	19	18
Hungry Owl All-Night Grocers	19	16

10. ***(1 point)*** **Which shipping company has shipped the fewest orders? Show the company name and number of shipped orders**

```
SELECT s.companyname, COUNT(o.orderid) AS shipped_orders
FROM orders o
JOIN shippers s ON s.shipperid = o.shipvia
GROUP BY 1
ORDER BY 2
LIMIT 1
```

Expected:

companyname	shipped_orders
Speedy Express	249

11. ***(1 point)*** **Categorize each employee at Northwind by the number of orders they have processed. If they have processed 75 or more orders, classify them as `High Performer`. If they have between 50 and 74 orders, classify as `Mid Tier`. Lower than 50 orders, classify as `Low Performer`.**

```
SELECT t1.*, CASE WHEN num_orders >= 75 THEN 'High Performer'
WHEN num_orders >= 50 THEN 'Mid Tier'
ELSE 'Low Performer'
END AS performance_rating
```

```
 FROM (
SELECT e.firstname || ' ' || e.lastname as employeename, COUNT(o.orderid) AS num_orders
FROM employees e
JOIN orders o ON e.employeeid = o.employeeid
GROUP BY 1) t1
```

Expected:

employeename	num_orders	performance_rating
Robert King	72	Mid Tier
Nancy Davolio	123	High Performer
Laura Callahan	104	High Performer
Michael Suyama	67	Mid Tier
Andrew Fuller	96	High Performer
Steven Buchanan	42	Low Performer
Janet Leverling	127	High Performer
Margaret Peacock	156	High Performer
Anne Dodsworth	43	Low Performer

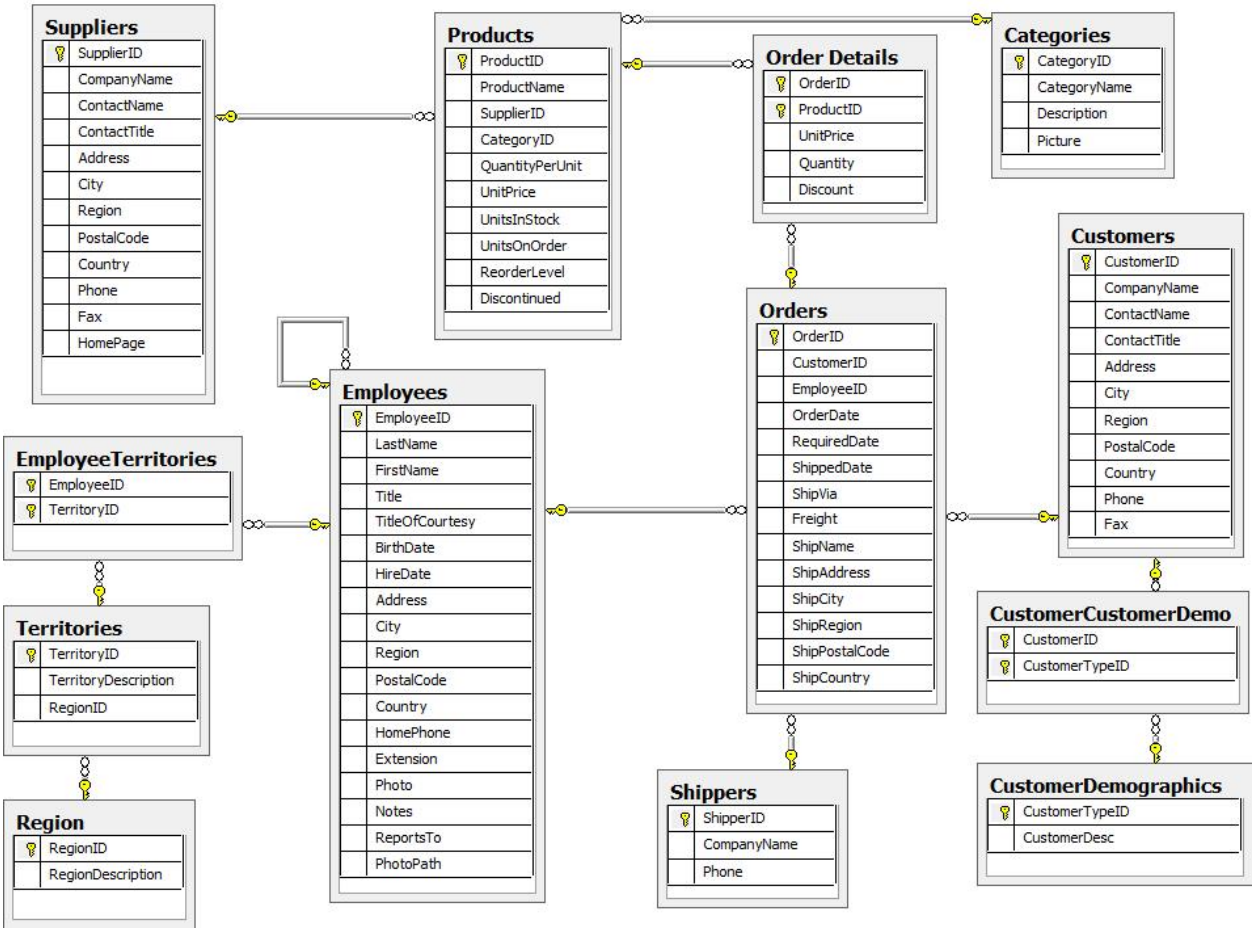

Figure 1: Northwind ERD