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Assignment No 6

Aim: To design and implement a data warehouse for a customer order processing system in a company

Creating Database:

Schemas:

--Headquarter Database

```
CREATE DATABASE Headquarter;
use Headquarter;
CREATE TABLE Customer (
    Customer_id INT PRIMARY KEY,
    Customer_name VARCHAR(50),
    City_id INT,
    First_order_date DATE,
    FOREIGN KEY (City_id) REFERENCES Sales.Headqarters(City_id)
);

CREATE TABLE Walk_in_customers (
    Customer_id INT PRIMARY KEY,
    tourism_guide VARCHAR(50),
    Time DATETIME,
    FOREIGN KEY (Customer_id) REFERENCES Customer(Customer_id)
);

CREATE TABLE Mail_order_customers (
    Customer_id INT PRIMARY KEY,
    post_address VARCHAR(100),
```

```
    Time DATETIME,
    FOREIGN KEY (Customer_id) REFERENCES Customer(Customer_id)
);
```

--Sales Database

```
CREATE DATABASE Sales;
use Sales ;
CREATE TABLE Headqarters (
    City_id INT PRIMARY KEY,
    City_name VARCHAR(50),
    Headquarter_addr VARCHAR(100),
    State VARCHAR(50),
    Time DATETIME
);

CREATE TABLE Stores (
    Store_id INT PRIMARY KEY,
    City_id INT,
    Phone VARCHAR(20),
    Time DATETIME,
    FOREIGN KEY (City_id) REFERENCES Headqarters(City_id)
);

CREATE TABLE Items (
    Item_id INT PRIMARY KEY,
    Description VARCHAR(100),
    Size VARCHAR(20),
    Weight DECIMAL(10,2),
```

```
    Unit_price DECIMAL(10,2),
    Time DATETIME
);

CREATE TABLE Stored_items (
    Store_id INT,
    Item_id INT,
    Quantity_held INT,
    Time DATETIME,
    PRIMARY KEY (Store_id, Item_id),
    FOREIGN KEY (Store_id) REFERENCES Stores(Store_id),
    FOREIGN KEY (Item_id) REFERENCES Items(Item_id)
);

CREATE TABLE OrderT (
    Order_no INT PRIMARY KEY,
    Order_date DATE,
    Customer_id INT,
    FOREIGN KEY (Customer_id) REFERENCES Headquarter.Customer(Customer_id)
);

CREATE TABLE Ordered_item (
    Order_no INT,
    Item_id INT,
    Quantity_ordered INT,
    Ordered_price DECIMAL(10,2),
    Time DATETIME,
    PRIMARY KEY (Order_no, Item_id),
    FOREIGN KEY (Order_no) REFERENCES OrderT(Order_no),
    FOREIGN KEY (Item_id) REFERENCES Items(Item_id)
```

);

Creating Datawarehouse:

```
create database datawarehouse;
use datawarehouse;
CREATE TABLE Sales_Fact (
    Store_id INT,
    Item_id INT,
    Quantity_held INT,
    Unit_price DECIMAL(10,2),
    PRIMARY KEY (Store_id, Item_id),
    FOREIGN KEY (Store_id) REFERENCES Sales.Stores(Store_id),
    FOREIGN KEY (Item_id) REFERENCES Sales.Items(Item_id)
);

CREATE TABLE Store_Dim (
    Store_id INT PRIMARY KEY,
    City_id INT,
    Phone VARCHAR(20),
    FOREIGN KEY (City_id) REFERENCES Sales.Headqarters(City_id)
);

CREATE TABLE Item_Dim (
    Item_id INT PRIMARY KEY,
    Description VARCHAR(100),
    Size VARCHAR(20),
    Weight DECIMAL(10,2)
);
```

```
CREATE TABLE City_Dim (
    City_id INT PRIMARY KEY,
    City_name VARCHAR(50),
    State VARCHAR(50)
);
```

Insert Sample Data:

```
use Headquarter;
-- Customer table
INSERT INTO Customer (Customer_id, Customer_name, City_id, First_order_date) VALUES
(1, 'John Smith', 1, '2022-01-01'),
(2, 'Mary Johnson', 2, '2022-02-15'),
(3, 'David Lee', 3, '2022-03-20');

-- Walk_in_customers table
INSERT INTO Walk_in_customers (Customer_id, tourism_guide, Time) VALUES
(1, 'Tourist Guide A', '2022-01-01 10:00:00'),
(2, 'Tourist Guide B', '2022-02-15 15:30:00');

-- Mail_order_customers table
INSERT INTO Mail_order_customers (Customer_id, post_address, Time) VALUES
(3, '123 Main St, Anytown USA', '2022-03-20 09:00:00');

use Sales;
-- Headqarters table
INSERT INTO Headqarters (City_id, City_name, Headquarter_addr, State, Time) VALUES
(1, 'New York City', '123 Broadway, Suite 500', 'NY', '2022-01-01 00:00:00'),
(2, 'Los Angeles', '456 Main St, 12th Floor', 'CA', '2022-02-01 00:00:00'),
(3, 'Chicago', '789 Elm St, Suite 200', 'IL', '2022-03-01 00:00:00');
```

```
-- Stores table
INSERT INTO Stores (Store_id, City_id, Phone, Time) VALUES
(1, 1, '555-1234', '2022-01-02 09:00:00'),
(2, 1, '555-5678', '2022-01-02 09:00:00'),
(3, 2, '555-9876', '2022-02-15 10:30:00'),
(4, 3, '555-4321', '2022-03-20 11:45:00');

-- Items table
INSERT INTO Items (Item_id, Description, Size, Weight, Unit_price, Time) VALUES
(1, 'Widget', 'Small', 1.0, 10.00, '2022-01-01 00:00:00'),
(2, 'Gizmo', 'Large', 2.5, 25.00, '2022-02-01 00:00:00'),
(3, 'Thingamajig', 'Medium', 0.5, 5.00, '2022-03-01 00:00:00');

-- Stored_items table
INSERT INTO Stored_items (Store_id, Item_id, Quantity_held, Time) VALUES
(1, 1, 100, '2022-01-02 09:00:00'),
(1, 2, 50, '2022-01-02 09:00:00'),
(2, 1, 75, '2022-01-02 09:00:00'),
(3, 2, 100, '2022-02-15 10:30:00'),
(4, 3, 200, '2022-03-20 11:45:00');

-- OrderT table
INSERT INTO OrderT (Order_no, Order_date, Customer_id) VALUES
(1001, '2022-02-15', 1),
(1000,'2022-01-01',2),
(1002,'2022-03-20',3);

INSERT INTO Ordered_item (Order_no, Item_id,Quantity_ordered,Ordered_price,Time)
VALUES
 (1000,1,2,20.00,'2022-01-01 10:00:00'),
```

(1001,2,3,75.00,'2022-02-15 15:30:00'),

(1002,3,1,5.00,'2022-03-20 09:00:00');

Loading data into datawarehouse: Initial Load

```
use datawarehouse;
 -- Load data into the dimension tables:
 INSERT INTO Store_Dim (Store_id, City_id, Phone)
SELECT DISTINCT Store_id, City_id, Phone
FROM Sales.Stores;

INSERT INTO Item_Dim (Item_id, Description, Size, Weight)
SELECT DISTINCT Item_id, Description, Size, Weight
FROM Sales.Items;

INSERT INTO City_Dim (City_id, City_name, State)
SELECT DISTINCT City_id, City_name, State
FROM Sales.Headqarters;

-- Load data into the fact table:
INSERT INTO Sales_Fact (Store_id, Item_id, Quantity_held, Unit_price)
SELECT si.Store_id, si.Item_id, si.Quantity_held, i.Unit_price
FROM Sales.Stored_items si
JOIN Sales.Items i ON si.Item_id = i.Item_id;
```

Build data warehouse / OLAP which will answer the following queries :

1. Find all the stores along with city, state, phone, description, size, weight and unit price that hold a particular item of stock.

```
222
223 •  SELECT s.Store_id, c.City_name, c.State, s.Phone, i.Description, i.Size, i.Weight, f.Unit_price
224    FROM Sales_Fact f
225    JOIN Store_Dim s ON f.Store_id = s.Store_id
226    JOIN Item_Dim i ON f.Item_id = i.Item_id
227    JOIN City_Dim c ON s.City_id = c.City_id
228    WHERE i.Description = 'Widget';
229
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Store_id	City_name	State	Phone	Description	Size	Weight	Unit_price
1	New York City	NY	555-1234	Widget	Small	1.00	10.00
2	New York City	NY	555-5678	Widget	Small	1.00	10.00

2. Find all the orders along with customer name and order date that can be fulfilled by a given store.

```
229
230    -- 2.
231
232 •  SELECT OrderT.Order_no, Customer.Customer_name, OrderT.Order_date
233    FROM Sales_Fact
234    JOIN Store_Dim ON Sales_Fact.Store_id = Store_Dim.Store_id
235    JOIN Item_Dim ON Sales_Fact.Item_id = Item_Dim.Item_id
236    JOIN Sales.Ordered_item ON Sales_Fact.Store_id = Ordered_item.Item_id
237    JOIN Sales.OrderT ON Ordered_item.Order_no = OrderT.Order_no
238    JOIN Headquarter.Customer ON OrderT.Customer_id = Customer.Customer_id
239    WHERE Store_Dim.Store_id = 3;
240
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Order_no	Customer_name	Order_date
1002	David Lee	2022-03-20

3. Find all stores along with city name and phone that hold items ordered by given customer.

```
239  -- 3
240  SELECT DISTINCT Stores.Store_id, Headqarters.City_name, Stores.Phone
241  FROM Sales.Stores
242  INNER JOIN Sales.Headqarters ON Stores.City_id = Headqarters.City_id
243  INNER JOIN Sales.Stored_items ON Stores.Store_id = Stored_items.Store_id
244  INNER JOIN Sales.Ordered_item ON Stored_items.Item_id = Ordered_item.Item_id
245  INNER JOIN Sales.OrderT ON Ordered_item.Order_no = OrderT.Order_no
246  INNER JOIN Headquarter.Customer ON OrderT.Customer_id = Customer.Customer_id
247  WHERE Customer.Customer_id = 2;
248
249
250
251
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Store_id	City_name	Phone
1	New York City	555-1234
2	New York City	555-5678

4. Find the headquarter address along with city and state of all stores that hold stocks of an item above a particular level.

```
251  -- 4
252  SELECT DISTINCT h.Headquarter_addr, h.City_name, h.State
253  FROM Sales.Stored_items si
254  JOIN Sales.Stores s ON si.Store_id = s.Store_id
255  JOIN Sales.Headqarters h ON s.City_id = h.City_id
256  JOIN Sales.Items i ON si.Item_id = i.Item_id
257  WHERE si.Quantity_held > 75
258  AND i.Description = 'Widget';
259
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Headquarter_addr	City_name	State
123 Broadway, Suite 500	New York City	NY

5. For each customer order, show the items ordered along with description, store id and city name and the stores that hold the items

```
261  -- 5
262  SELECT o.Order_no, i.Description, si.Store_id, h.City_name AS Store_City
263  FROM Sales.OrderT o
264  JOIN Sales.Ordered_item oi ON o.Order_no = oi.Order_no
265  JOIN Sales.Items i ON oi.Item_id = i.Item_id
266  JOIN Sales.Stored_items si ON oi.Item_id = si.Item_id
267  JOIN Sales.Stores s ON si.Store_id = s.Store_id
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Order_no	Description	Store_id	Store_City
1002	Thingamajig	4	Chicago

6. Find the city and the state in which a given customer lives.

```
270
271     -- 6
272     SELECT c.Customer_name, h.City_name, h.State
273     FROM Headquarter.Customer c
274     JOIN Sales.Headqarters h
275     ON c.City_id = h.City_id
276     WHERE c.Customer_id = 2;
277
278
279
280
```

Result Grid | Filter Rows: | Export: | Wrap Cell Cont

Customer_name	City_name	State
Mary Johnson	Los Angeles	CA

Conclusion: Designed and implemented data warehouse of enterprise