

DDL Script:

```
CREATE SCHEMA Mumbai_Dabbawala;  
SET SEARCH_PATH TO Mumbai_Dabbawala;
```

```
CREATE TABLE Dabba (  
    Did CHAR(10),  
    SD_Code CHAR(10),  
    SS_Code VARCHAR,  
    DS_Code VARCHAR,  
    DD_Code CHAR(10),  
    Express_Tower CHAR(1),  
    Floor_no INTEGER,  
    PRIMARY KEY (Did)  
);
```

```
CREATE TABLE Dabbawala (  
    DWid INTEGER,  
    Did CHAR(100),  
    DW_Fname VARCHAR,  
    DW_Mname VARCHAR,  
    DW_Lname VARCHAR,  
    Gender CHAR(1),  
    DOJ DATE,  
    Contact_no CHAR(10),  
    Supervisor_id INTEGER,  
    PRIMARY KEY (DWid),  
    FOREIGN KEY (Supervisor_id) REFERENCES Dabbawala(DWid)  
);
```

```
CREATE TABLE Customer (  
    Cid VARCHAR(10),  
    Did CHAR(10),  
    C_Fname VARCHAR,  
    C_Mname VARCHAR,  
    C_Lname VARCHAR,  
    Desti_Address VARCHAR,  
    Contact_no CHAR(10),  
    Debt INTEGER,  
    PRIMARY KEY (Cid),  
    FOREIGN KEY (Did) REFERENCES Dabba(Did)  
);
```

```
CREATE TABLE Orders (  
    Oid VARCHAR(10),  
    Cid VARCHAR(10),
```

```
    Date DATE,  
    PRIMARY KEY (Oid),  
    FOREIGN KEY (Cid) REFERENCES Customer(Cid)  
);
```

```
CREATE TABLE Payment (  
    Tid CHAR(12),  
    Oid CHAR(10),  
    Cid CHAR(10),  
    Date DATE,  
    Amount INTEGER,  
    PRIMARY KEY (Tid),  
    FOREIGN KEY (Oid) REFERENCES Orders(Oid),  
    FOREIGN KEY (Cid) REFERENCES Customer(Cid)  
);
```

```
CREATE TABLE Donation (  
    DTranid CHAR(12),  
    Cid CHAR(10),  
    D_Fname VARCHAR,  
    D_Mname VARCHAR,  
    D_Lname VARCHAR,  
    Amount INTEGER,  
    Date DATE,  
    Contact_no CHAR(10),  
    PRIMARY KEY (DTranid),  
    FOREIGN KEY (Cid) REFERENCES Customer(Cid)  
);
```

```
CREATE TABLE Holiday (  
    DWid INTEGER,  
    hdate DATE,  
    Reason VARCHAR,  
    FOREIGN KEY (DWid) REFERENCES Dabbawala(DWid)  
);
```

```
CREATE TABLE Punishment (  
    DWid INTEGER,  
    Date DATE,  
    Reason VARCHAR,  
    Punishment VARCHAR,  
    Status CHAR(15)  
    FOREIGN KEY (DWid) REFERENCES Dabbawala(DWid)  
);
```

Queries:

Que 1: Find list of all supervisors of dabbawalas

Ans: select distinct supervisor_id from dabbawala where supervisor_id is Not null

Que 2: Find the no. of dabbas sent in a particular area(Destination area lets say panvel whose ds code is PL)

Ans: select count(did) from dabba where ds_code='PL'

Que 3:Find the no. of dabbas received from a particular area(source area lets say church gate whose ss_code is C)

Ans: select count(did) from dabba where ss_code='C'

Que 4: Find the Dabbawal who has taken most leaves.

Ans: SELECT DWid, COUNT(*) AS Leave_Count FROM Holiday GROUP BY DWid ORDER BY Leave_Count DESC LIMIT 1;

Que 5: Retrieve dabbas served by the supervisors.

Ans: SELECT d.Did, d.DWid

FROM Dabbawala d

JOIN (SELECT DISTINCT Supervisor_id FROM Dabbawala WHERE Supervisor_id IS NOT NULL) s

ON s.Supervisor_id = d.DWid;

Que 6: Retrieve data on the number of male dabbawalas.

Ans: SELECT COUNT(*) AS MaleDabbawalas FROM Dabbawala WHERE Gender = 'M';

Que 7: Retrieve data on the number of female dabbawalas.

Ans: SELECT COUNT(*) AS FemaleDabbawalas FROM Dabbawala WHERE Gender = 'F';

Que 8: Retrieve the name of all male dabbawalas.

Ans: SELECT dw_fname,dw_mname,dw_lname AS MaleDabbawalas FROM Dabbawala WHERE Gender = 'M';

Que 9: Retrieve the name of all female dabbawalas.

Ans: SELECT dw_fname,dw_mname,dw_lname AS FemaleDabbawalas FROM Dabbawala WHERE Gender = 'F';

Que 10: Retrieve dabbas that are picked from same station.(lets say that the station code is C(Andheri)).

Ans: select did from dabba where ss_code = 'C'

Que 11: Retrieve dabbas that are dropped at the same station (Lets say that the station code is K(Kalyan junction)).

Ans: select did from dabba where ds_code = 'K'

Que 12: Count no. of dabbas picked from particular station. (Lets say that the particular station is GO (Goregaon)).

Ans: SELECT COUNT(*) AS NumberOfDabbasPicked FROM Dabba WHERE ss_code = 'GO'

Que 13: Count no. of dabbas dropped at a particular station. (Lets say that the particular station is T (Thane)).

Ans: SELECT COUNT(*) AS NumberOfDabbasdropped FROM Dabba WHERE ds_code = 'T'

Que 14: list DWid,DW_Fname,DW_Mname,DW_Lname of the most experienced dabbawala.

Ans: SELECT DWid,DW_Fname,DW_Mname,DW_Lname FROM Dabbawala ORDER BY date ASC LIMIT 1;

Que 15: Find experience of a particular dabbawala.

Ans: select dwid,EXTRACT (YEAR FROM CURRENT_DATE) - EXTRACT (YEAR FROM date) as experience FROM dabbawala

Que 16: find the dabbawala who took holiday on the same day.

Ans: SELECT DISTINCT dw.DWid,DW_Fname,DW_Mname,DW_Lname FROM Dabbawala dw JOIN holiday h ON dw.DWid = h.DWid WHERE DATE(dw.date) = DATE(h.hdate);

Que 17: No. of dabbawalas taking leave for medical emergency.

Ans: select count(*) from holiday where reason = 'Medical emergency'

Que 18: Dabbawalas who received punishment due to a reason. (lets say the reason is misbehaviour).

Ans: select DWid from Punishment where reason = 'Misbehaviour'

Que 19: Dabbawala whose punishment is incomplete.

Ans: select DWid from punishment where status = 'Incomplete'

Que 20: List the name of all the customers.

Ans: select c_fname, c_mname, c_lname from customer

Que 21: For a particular customer which Dabbawla picks up dabba. (lets say for customer C5)

Ans: SELECT Dab.DWid, Dab.DW_Fname, Dab.DW_Mname, Dab.DW_Lname FROM Dabbawala Dab join customer C on dab.Did = c.Did WHERE C.Cid = 'C5';

Que 22: Find the number of customers who are in debt.

Ans: select count(*) from customer where debt = 0;

Que 23: find the No. of customers who have placed an order on the same date.

Ans: SELECT COUNT(*) AS Number_of_Customers
FROM (
 SELECT O.Date, COUNT(DISTINCT O.Cid) AS Customers
 FROM Orders O
 GROUP BY O.Date
 HAVING COUNT(DISTINCT O.Cid) > 1
) AS Subquery;

Que 24: what is the dabba id for a particular order id.(lets say that the particular order id is T012121)

Ans: select Did from customer join orders on customer.Cid = orders.Cid where Oid='T012121'

Que 25: who was the dabbawala who has delivered a particular dabba. (lets say that the particular dabba is D1 and it is delivered by ramesh motilal pandey)

Ans:select DW_Fname,DW_Mname,DW_Lname from dabbawala where did = 'D1'

Que 26: find a particular transaction id belongs to what customer.

Ans select cid from payment where tid = '175247189635'

Que 27: Find the numbers of customers who have donated

Ans: select count(*) from Donation where cid != 'NULL'

Que 28: List the name of donors.

Ans: select d_fname,d_mname,d_lname from donation

Que 29: Find customers with no orders.

Ans: SELECT C.Cid, C.C_Fname, C.C_Mname ,C.C_Lname
FROM Customer C
LEFT JOIN Orders O ON C.Cid = O.Cid
WHERE O.Oid IS NULL;

Que 30: Find Dabbawala with no supervisors

Ans: SELECT DWid, DW_Fname, DW_Mname ,DW_Lname
FROM Dabbawala
WHERE Supervisor_id IS NULL;

Que 31: Find customers who haven't paid their orders

Ans: SELECT C.Cid, C.C_Fname, C.C_Lname
FROM Customer C
INNER JOIN Orders O ON C.Cid = O.Cid
LEFT JOIN Payment P ON O.Oid = P.Oid
WHERE P.Oid IS NULL;

Que 32: Find customers who placed orders in a specific month (lets say the month is april (04))

```
Ans: SELECT DISTINCT C.Cid, C.C_Fname,C.C_Mname ,C.C_Lname
FROM Customer C
INNER JOIN Orders O ON C.Cid = O.Cid
WHERE EXTRACT(MONTH FROM O.Date) = 04
```

Que 33: Find the customer who have placed orders on multiple dates.

```
Ans: SELECT C.Cid, C.C_Fname,C.C_Mname ,C.C_Lname
FROM Customer C
INNER JOIN Orders O ON C.Cid = O.Cid
GROUP BY C.Cid, C.C_Fname, C.C_Mname, C.C_Lname
HAVING COUNT(DISTINCT O.Date) > 1;
```

Que 34: Find the most common DS_code for delivers.

```
Ans: SELECT DS_Code, COUNT(*) AS Total_Deliveries
FROM Dabba
GROUP BY DS_Code
ORDER BY Total_Deliveries DESC
LIMIT 1;
```

Que 35: Find the total amount of payments received on a specific date.

```
Ans: SELECT SUM(Amount) AS Total_Payments
FROM Payment
WHERE Date = '2023-07-12';
```

Que 36: Find the top 5 Destination areas with the highest Delivery Counts.

```
Ans: SELECT DS_Code, COUNT(*) AS Total_Deliveries
FROM Dabba
GROUP BY DS_Code
ORDER BY Total_Deliveries DESC
LIMIT 5;
```

Que 37: Find the total revenue this month. (current month is april)

```
Ans: SELECT SUM(Amount) AS Total_Revenue_This_Month
FROM Payment
WHERE EXTRACT(MONTH FROM Date) = EXTRACT(MONTH FROM CURRENT_DATE);
```

Que 38: List the donor's name,amount with the highest amount of donation

```
Ans: SELECT D.D_Fname, D.D_Mname, D.D_Lname, MAX(D.Amount) AS
Highest_Donation_Amount
FROM Donation D
GROUP BY D.D_Fname, D.D_Mname, D.D_Lname
ORDER BY Highest_Donation_Amount DESC
LIMIT 1;
```

Que 39: List customer and their total debt.

```
Ans: SELECT Cid, C_Fname, C_Mname, C_Lname, SUM(Debt) AS TotalDebt
FROM Customer
GROUP BY Cid, C_Fname, C_Mname, C_Lname
ORDER BY TotalDebt DESC;
```

Que 40: Retrieve Dabbawalas and their contact information.

```
Ans: SELECT DWid, DW_Fname, DW_Mname, DW_Lname, Contact_no
FROM Dabbawala;
```

Challenges Faced:

- Making the Tables in reduced form.
- Knowing the work process of the Mumbai Dabbawala System. It was one of the biggest challenges faced as we were not getting any reference on the internet regarding the database of mumbai dabbawala so we went through the internet trying to understand their working process and then tried to derive an optimal solution for it.
- Inserting data was a tedious task for us because the attributes needed to be checked properly according to the dabba codes and station codes.

Learnings:

- Practical application of Database.
- Importance of using reduced tables.
- How important it is for any organization to store data and maintain a proper database.

Extra Work:

- We had a chat with one of the dabbawal to get a brief overview of the process.