CID → Client_BD, Client_FirstName, Client_LastName, Client_Sex
PID → P_Date
EID → E_BD, E_Name, E_Sex, E_Type
DID → D_Name
TID → VIN
VIN → TID
LID → Latitude, Longitude
TOID → Pincode
COID → Consumer_Name

Our relations already satisfy the BCNF criteria.

SQL Queries

1. --We can also figure out which company requires what kind of waste the most.--

SQL>select Consumer_Name,Waste_Type,QUANTITY from
(select Consumer_Name,total, Waste_Type, MAX(total) OVER (PARTITION BY
Consumer_Name) AS QUANTITY
from(select   Consumer_Name, Waste_Type, SUM(Quantity) as total
From(
select t.TOID, c.COID, t.Waste_Type, t.Quantity, cc.Consumer_Name
from F21_S003_19_typeOW t
inner join F21_S003_19_collects c ON t.TOID = c.TOID
inner join F21_S003_19_consumer cc ON cc.COID = c.COID) dc
group by Waste_Type, Consumer_Name) ab) xy
where total = QUANTITY;

OUTPUT

CONSUMER_NAME

WASTE_TYPE   QUANTITY
--- ----------
Gin
Plastic   54

Kat
Industrial   32

Yuma
Plastic   52

CONSUMER_NAME

WASTE_TYPE   QUANTITY
--- ----------
jul
Recyclable   16

2. --From the pincode we can figure out which waste type was produced the most in that area.--

SQL>select Pincode,Waste_Type,Total_Waste_KGs from
(select Pincode,total, Waste_Type, MAX(total) OVER(PARTITION BY Pincode) AS
Total_Waste_KGs
from(select Pincode, Waste_Type, SUM(Quantity) as total
From(
select t.Pincode, t.Waste_Type, t.Quantity
from F21_S003_19_typeOW t) dc
group by Waste_Type, Pincode) ab) xy
where total = Total_Waste_KGs;

OUTPUT

PINCODE	WASTE_TYPE	TOTAL_WASTE_KGS
2235	Industrial	13
2421	Biodegradable	26
3408	Plastic	52
3800	Industrial	38
3824	Plastic	32
5111	Biodegradable	11
7794	Biodegradable	4
8625	Industrial	10

8 rows selected.

3. --We can get the total amount of waste generated by the client in each category and also the total amount in all category of waste of an individual client.--

SQL>SELECT Client_FirstName, Waste_Type, SUM(Quantity) as Per_category_quantity
FROM F21_S003_19_client
INNER JOIN F21_S003_19_generate
ON F21_S003_19_client.CID = F21_S003_19_generate.CID
inner join F21_S003_19_typeOW
on F21_S003_19_typeOW.TOID = F21_S003_19_generate.TOID
group by rollup(Client_FirstName, Waste_Type);

OUTPUT

CLIENT_FIRSTNAME	WASTE_TYPE

PER_CATEGORY_QUANTITY

```
---------------------
Nikki              Biodegradable
               12

Nikki              Demolition
               13

Nikki              Non Biodigradable
                6


CLIENT_FIRSTNAME       WASTE_TYPE
---------------------- ----------------------------------------------
PER_CATEGORY_QUANTITY
---------------------
Nikki              Recyclable
               13

Nikki
               44

Karina             Biodegradable
               25


CLIENT_FIRSTNAME       WASTE_TYPE
---------------------- ----------------------------------------------
PER_CATEGORY_QUANTITY
---------------------
Karina             Non Biodigradable
                7

Karina             Plastic
               34

Karina
               66


CLIENT_FIRSTNAME       WASTE_TYPE
---------------------- ----------------------------------------------
PER_CATEGORY_QUANTITY
---------------------
Ulrika             Biodegradable
```

```
                    4

Ulrika              Construction
           12

Ulrika              Metallic
           10


CLIENT_FIRSTNAME        WASTE_TYPE
----------------------- -------------------------------------------------
PER_CATEGORY_QUANTITY
--------------------
Ulrika              Non Biodigradable
           1

Ulrika              Plastic
           22

Ulrika              Recyclable
           9


CLIENT_FIRSTNAME        WASTE_TYPE
----------------------- -------------------------------------------------
PER_CATEGORY_QUANTITY
---------------------
Ulrika
           58

Gwenneth            Construction
           4

Gwenneth            Hazardous
           2


CLIENT_FIRSTNAME        WASTE_TYPE
----------------------- -------------------------------------------------
PER_CATEGORY_QUANTITY
---------------------
Gwenneth            Industrial
           6
```

```
Gwenneth            Metallic
              10


Gwenneth            Recyclable
               7



CLIENT_FIRSTNAME        WASTE_TYPE
------------------------ -----------------------------------------------
PER_CATEGORY_QUANTITY
--------------------
Gwenneth
              29

Marchall            Biodegradable
              19

Marchall            Industrial
              55



CLIENT_FIRSTNAME        WASTE_TYPE
------------------------ -----------------------------------------------
PER_CATEGORY_QUANTITY
--------------------
Marchall            Plastic
              52

Marchall
             126


             323


27 rows selected.
```

4. --By the collected waste we can also know which type of waste is generated the most.--

SQL>select Waste_Type, QUANTITY
from (SELECT Waste_Type, SUM(Quantity) QUANTITY
FROM F21_S003_19_typeOW t1
GROUP BY Waste_Type) dc
where dc.QUANTITY>= ALL (SELECT SUM(Quantity)
FROM F21_S003_19_typeOW t1
GROUP BY Waste_Type);

OUTPUT

WASTE_TYPE	QUANTITY
Plastic	108

5. --We can get the amount of total quantity of a particular waste type in a particular pincode--

SQL>select Pincode, Waste_Type, QUANTITY AS WMS from (
SELECT Pincode, Waste_Type, SUM(Quantity) as QUANTITY
FROM F21_S003_19_typeOW
GROUP BY ROLLUP (Pincode, Waste_Type))
Where Waste_Type IS NOT NULL
order by (QUANTITY) desc;

OUTPUT

PINCODE	WASTE_TYPE	WMS
3408	Plastic	52
3800	Industrial	38
3824	Plastic	32
2421	Biodegradable	26
2421	Plastic	24
2235	Industrial	13
3800	Non Biodigradable	13
2421	Recyclable	13
3408	Biodegradable	11
5111	Biodegradable	11
3408	Metallic	10

PINCODE	WASTE_TYPE	WMS

```
---------- -------------------------------------------------- ----------
      3800 Metallic                                               10
      8625 Industrial                                             10
      3408 Recyclable                                              9
      3408 Demolition                                              8
      3824 Recyclable                                              7
      2421 Construction                                            7
      3824 Construction                                            5
      7794 Biodegradable                                           4
      3408 Construction                                            4
      3800 Demolition                                              4
      3800 Biodegradable                                           4

   PINCODE WASTE_TYPE                                          WMS
---------- -------------------------------------------------- ----------
      2421 Hazardous                                              2
      3824 Non Biodigradable                                      1
      3824 Demolition                                             1
```

25 rows selected.

6. --We can get the names of employees who picks Biodegradable waste--

```
SQL>SELECT E_Name , E_Type, Waste_Type
FROM F21_S003_19_employee
INNER JOIN F21_S003_19_collection
ON F21_S003_19_employee.EID = F21_S003_19_collection.EID
inner join F21_S003_19_typeOW
on F21_S003_19_typeOW.TOID = F21_S003_19_collection.TOID
group by E_Type, Waste_Type,E_Name having Waste_Type='Biodegradable' AND
E_Type='Staff';
```

OUTPUT

```
E_NAME                  E_TYPE
------------------------ --------------------
WASTE_TYPE
--------------------------------------------------
Nikki                   Staff
Biodegradable

Valaria                 Staff
Biodegradable
```

7. --We can get the list of employee names who work in HR department--

SQL>select d.D_Name, e.E_Type, e.E_Name
from F21_S003_19_department d
inner join F21_S003_19_employee e ON d.DID = e.DID
group by D_Name, E_Type, E_Name
Having E_Type = 'HR';

OUTPUT

D_NAME	E_TYPE	E_NAME
delivery	HR	Jay
transport	HR	Jay
transport	HR	Nikki
admistrative	HR	Nikki
delivery	HR	Jatan

8. --We can get the Average quantity of waste greater than 5 generated in a particular pincode--

SQL>SELECT distinct Pincode, AVG(Quantity)
FROM F21_S003_19_typeOW
group by Pincode
having avg (Quantity) > '5';

PINCODE	AVG(QUANTITY)
3824	9.2
5111	11
8625	10
3408	15.6666667
2235	13
3800	8.625
2421	10.2857143

7 rows selected.

9. --We can figure out which day the waste was produced the most.--

SQL>SELECT Waste_generation_date, Quantity FROM F21_S003_19_typeOW where
Quantity= (SELECT MAX(Quantity)
FROM F21_S003_19_typeOW);

```
WASTE_GEN  QUANTITY
--------- ----------
11-MAR-03      52
```