answer—17.1

1605023

We have to design a star schema for the data warehouse of call duration and bill of different types of calls of different users from all mobile service phone companies.

The steps for designing a star schema are as follows:

Step – 1

Design fact table with measure attributes and dimensional attributes.

Step – 2

Design the dimensional tables.

Step – 3

Design the star schema.

Solution

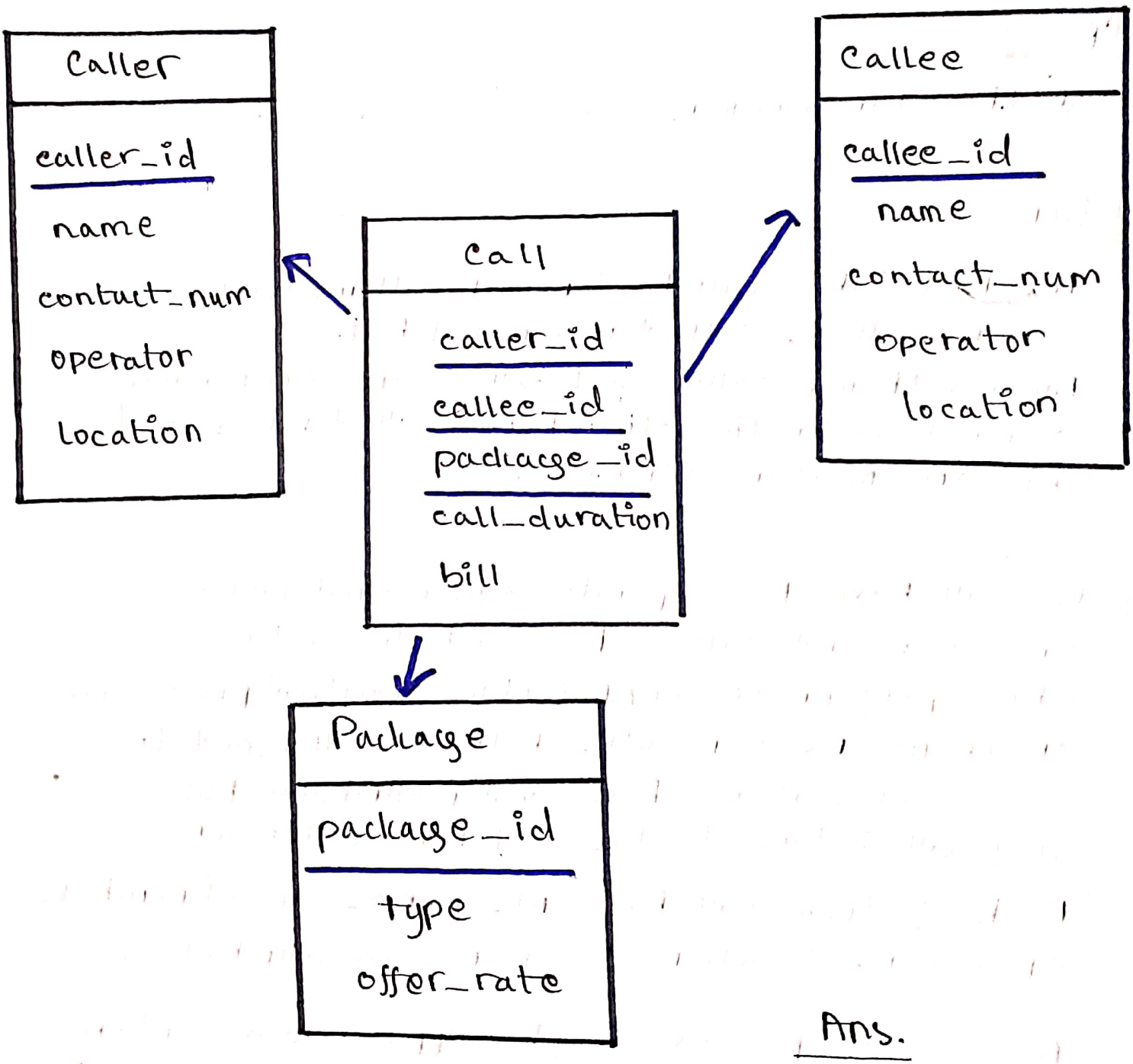
i. The fact table will be for each call involving caller, callee, call duration and bill. Among them, caller and callee are dimensional attributes. On the other hand, call duration and bill are measure attributes.

ii. We will have two separate dimensional tables for caller and callee to avoid difficulties while performing OLAP (online analytical processing) on them. As a result, both the caller and the callee schemas will have similar attributes but they will belong to two different dimensions. Both of them will have id, name, contact number, operator, location / tower info as attributes.

Also, some package may be applied to a certain call which regulates the pricing. So, an additional package attribute will be added to fact table

as dimensional attribute and a dimensional table for package will be added.

(iii.) Thus, we have the following star schema:



Ans.

answer – 18.1

1605023

We need to answer/provide solutions to the following questions:

a. Find four useful DSS reports that can be generated from the given star schema from aggregations (average, max, min, sum, count).

b. Find any missing dimension.

Solution (a)

DSS report is basically the output from a data warehouse structure following the star schema. This report is generated from aggregations (average, max, min, sum, count) rather than normal queries. DSS reports usually help policy makers in decision making as they provide overall statistics of stored data.

The followings are the four DSS reports that can be generated from given star schema:

i. Day or month or year-wise test count.

ii. gender or district-wise test count.

iii. average test prices

iv. pathologists' qualification-wise test count

These DSS reports can be generated from the provided dimension tables.

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Thus, our policy makers can get clinical dss reports from national health data warehouse.

(b)

There is no dimension (table) for hospital data. As a result, report focusing on hospital's performance can not be generated.

Ans.

answer-18.2

1605023

(a) Write cross tabulation structure of sales by cloth_size and item_name.

Solution

color = all

cloth_size \ item_name	dress	pants	shirt	skirt	total
small	8	18	23	2	51
medium	12	6	8	5	31
large	15	3	18	0	36
total	35	27	49	7	118

(b) Write SQL to find the cross-tab.

Solution

SQL for color

```
select sum(quantity) from sales
```

SQL for total of item_name

```
select item_name, sum(quantity)
from sales
group by item_name
```

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SQL for total of cloth_size

```
select cloth_size, sum(quantity)
from Sales
group by cloth_size
```

SQL for other cells

```
Select item_name, cloth_size, sum(quantity)
from Sales
group by item_name, cloth_size
```

Ans.

answer – 18.3

1605023

Write SQL for all DSS reports on location hierarchy.

Solution

report on city

R_c = select region, country, state, city, sum(quantity) as tot_c
from sales s, store t
where s.store_id = t.store_id
group by region, country, state, city

report on state

```
Rs = select region, country, state, sum(tot_c) as tot_s
     from Rc
     group by region, country, state
```

report on country

```
Rco = select region, country, sum(tot_s) as tot_co
      from Rs
      group by region, country
```

report on region

```
Rr = select region, sum(tot_co) as tot_r
     from Rco
     group by region
```

Ans.

answer – 19.1

1605023

Compare homogeneous and heterogeneous DDBMS in terms of storage, querying and transaction.

Solution

Storage

Data insertion and accession from global user to a certain local site is simple and feasible in homogeneous DDBMS. Data exchange among local sites is also feasible in homogeneous DDBMS. This is because every site has same DBMS. As a result, interfacing overhead is negligible. Thus, homogeneous DDBMS provides interoperability. On the other hand, different sites operate on different DBMS in heterogeneous DDBMS and this introduces a huge interfacing overhead. As a result, above-mentioned operations are not feasible for heterogeneous DDBMS.

querying

Due to interfacing overhead, querying is much slower and more complex in heterogeneous DDBMS than in homogeneous DDBMS.

Transaction

Interfacing overhead effects transaction in the similar way it effects querying.

Ans.

answer—19.2

1605023 Date :

Explain, the challenges in data transparency and transactional reliability in DDBMS.

Solution

challenges in transparency

There are 3 types of data transparency and each type has its own issues to be tackled.

(i.) network / distribution transparency

A global—local schema mapping is required so that no server location / address is needed for accessing database.

(ii) replication transparency

Schema mapping management is required.

(iii) fragmentation transparency

Data maintenance and user query processing are required.

challenges in reliability

The following issues are needed to be handled properly:

i. concurrency transparency by distributed concurrency control protocol
ii. failure atomicity by commit protocols
iii. data replication and parallelism
iv. Durability
v. lock management

Ans.