Design Data Warehouses For Given Below Products:

Note : While designing any Data Warehouse make sure to cover given below points.

a. Design Fact & Dimension tables

b. Create meaningful Primary & Foreign keys

c. Try to follow Star/SnowFlake Schema Design

d. Try to write few SQL queries to generate insightful business metrics (This is the critical

point because you need to understand the Data & Business both)

1. Design a Data Warehouse for IPL Cricket Tournament (Asked in Flipkart Interview for

Senior Data Engineer role)

Ans:- create table owner(owner\_id char(5) constraint wn\_pk primary key,

name varchar(20) not null,

profession varchar(20));

create table hotel(name varchar(30),

location varchar(30),

room\_no number(5),

room\_type varchar(20),

constraint hotl\_pk primary key(name, location));

create table team(name varchar(30),

state varchar(15) not null,

no\_of\_titles integer not null,

head\_coach varchar(20) unique not null,

pool char(1) not null,

owner\_id constraint tm\_fk1 references owner,

check(no\_of\_titles >= 0 and no\_of\_titles <13),

check(pool in ('A','B')));

create table sponsor(name varchar(30) constraint spn\_pk primary key,

fund integer not null,

period integer not null,

team\_name varchar (30),

foreign key(team\_name) references team(name));

create table support\_staff(staff\_id number(4) constraint stf\_pk primary key,

name varchar(30) not null,

field char(15) not null,

team\_name varchar(30),

foreign key(team\_name) references team(name));

create table player(franchise\_player\_id char(10) constraint plyr\_pk primary key,

name varchar(40) not null,

position number(2),

hotel\_name varchar(30),

location varchar(30),

skill\_level number(3),

team\_name varchar(30),

FOREIGN KEY (team\_name) REFERENCES team (name),

FOREIGN KEY (hotel\_name, location) REFERENCES hotel (name, location));

create table previousRecords(franchise\_player\_id constraint prvRec\_fk references player,

average number(3,2),

total\_wickets number(5),

total\_runs number(10),

no\_of\_matches number(5),

constraint prvRec\_pk primary key(franchise\_player\_id));

create table injury\_records(franchise\_player\_id constraint inj\_fk references player,

description varchar(20),

date\_of\_injury DATE,

details varchar(20),

constraint inj\_pk primary key(description, franchise\_player\_id));

create table match(name constraint mt\_fk1 references team,

team\_name varchar(30),

foreign key(team\_name) references team (name),

venue varchar(20),

date\_of\_match date,

constraint mt\_pk primary key(name, team\_name));

**Snowflake Schema Design for IPL Cricket Tournament**

**Hotel(Dim)**

**Sponsor(Fact)**

Nameloc

Room\_no

Room\_type

**Owner(Dim)**

Name

Fund

Period

team\_name

Owner\_id

Name

profession

**Injury\_record(Dim)**

**Nameloc(Dim)**

Name

Location

**support\_staff(Fact)**

Details

Description

Date\_of\_injury

Staff\_id

Name

Field

Team\_name

**Team(Dim)**

Name

State

No\_of\_titles

Pool

Head\_coach

**previousRecords(Dim)**

**Player(Fact)**

Average

Total Wickets

Total Runs

No\_of\_matches

Franchise\_player\_id

franchise\_player\_id

Name

Position

Hotel\_name

Location

Skill\_level

Team\_name

Head\_coach

**Head\_coach**

Name

Salary

Experience

Franchise(Dim)

Franchise\_name

Place\_of\_franchise

No\_of\_franchise

Franchise\_player\_id

**Match(Fact)**

Venue

Date\_of\_match

Team\_name

**SQL queries**

Q1. To display the venue, name of first team out of all the matches, and if the venue has no data it shows 'NO DATA ENTERED'. Also, if both first and the second team are same then display NULL for name of first team(alias used for column names)

Ans:- QUERY=> select nvl(venue,'NO DATA ENTERED') "Venue", nullif(name,team\_name) from match;

Q2. Select the player with highest skill level in every Participating team along with his skill\_level.

Ans:- select name ,skill\_level from player p where skill\_level = (select max(skill\_level) from player d where d.team\_name=p.team\_name);

Q3. Display the name of team, head coach, fund and period of a sponsor associated by that team using join query.

Ans:- Select team.team\_name, head\_coach, fund, period from team, sponsor where team.team\_name = sponsor.team\_name order by team\_name;

Q4. Display no. of matches, average and total runs by Rohit Sharma using uncorrelated query.

Ans:- Select no\_of\_matches, average, total\_runs from previousRecords where franchise\_player\_id in (Select franchise\_player\_id from player where name='Rohit Sharma');

Q5. Display venue in which playing teams won at least 2 titles.

Ans:- Select venue from match minus

Select venue from match, team where match.team\_name = team.team\_name and no\_of\_titles < 2;

Q6. Display the total no.of.sponsors per team along with the team name.

Ans:- Select count(Name) as No\_of\_sponsors, team\_name from sponsor group by team\_name;

Q7. Display the no of owners in those professions which have exactly 1 owner.

Ans:- Select count(owner\_id) as No\_of\_owners, profession from owner group by profession having count(owner\_id)=1;

Q8. Perform a left outer join on players and injury\_records of players based on their id and list the name, id, team name and injury description.

Ans:- Select Franchise\_player\_id, team\_name , name , description from player left join injury\_records on player.Franchise\_player\_id = injury\_records.Franchise\_player\_id;

2. Design a Data Warehouse for Food delivery app like Swiggy, Zomato (Asked in Grab

for Data Engineer role)

Ans:-

create table customer(

fname varchar2(20),

lname varchar2(20),

custid integer primary key,

emailid varchar2(20),

address varchar2(20),

phoneno integer,

city\_id integer

);

create table cuisine(

cuisineid integer primary key,

cuisinename varchar2(20),

cuisine\_cat\_id integer

);

create table employee(

empid integer primary key,

fname varchar2(20),

lname varchar2(20),

emailid varchar2(20),

address varchar2(20),

phoneno integer,

salary number(10,2),

designation\_id integer

);

create table chef(

chefid integer primary key,

chefname varchar2(20),

address varchar2(20),

phoneno varchar2(20),

Foreign Key(cuisineid) references cuisine(cuisineid),

Foreign Key(empid) references employee(empid),

emailid varchar2(20),

salary number(10,2));

create table ingredient(

ingid integer primary key,

ingname varchar2(20));

create table food(

foodid integer primary key,

foodname varchar2(20),

price integer,

quantity integer,

foodavail varchar2(20),

Foreign Key(cuisineid) references cuisine(cuisineid),

Foreign Key(ingid) references ingredient(ingid),

Foreign Key(chefid) references chef(chefid)

);

create table drink(

drinkid integer primary key,

drinkname varchar2(20),

price number(10,2),

quantity varchar2(20),

drinkavail varchar2(20));

create table delivery(

delid integer primary key,

delname varchar2(20),

vehicleno varchar2(20),

Foreign Key(custid) references customer(custid),

Foreign Key(empid) references employee(empid),

delcharge integer,

deldate date,

deltime varchar2(20));

create table order1(

ordid integer primary key,

totalcost integer,

Foreign Key(foodid) references food(foodid),

Foreign Key(drinkid) references drink(drinkid),

Foreign Key(delid) references delivery(delid)

);

create table payment(

payid integer primary key,

paymethod varchar2(20),

Foreign Key(custid) references customer(custid),

Foreign Key(ordid) references order1(ordid)

);

**SQL queries**

**Q1. Retrive fname and lname of all customers who has allergy from egg.**

**Ans:- select fname,lname**

**From customer**

**Where allergy=’egg’;**

**Q2. Retrive Ingredient name from all ingredients whose food name is pizza**

**Ans:- select ingname**

**From ingredient**

**Where ingid in (select ingid**

**From food**

**Where foodname=’pizza’);**

**Snowflake Schema Design for**  **Food delivery app like Swiggy, Zomato**

**Chef(Fact)**

**Cuisine category(Dim)**

**Cuisine(Dim)**

Cuisine\_cat\_id

Name

Recipe

Cuisineid

Cuisinename

Cuisine\_cat\_id

**Customer(Dim)**

chefid

chefname

address

phoneno

emailid

salary

cuisineid

empid

Fname

Lname

Custid

Emailid

Address

Phoneno

City\_id

**Designation(Dim)**

**Employee(Dim)**

Designation\_id

Name

description

Empid

Fname

Lname

Emailid

Address

Phoneno

Salary

Designation\_id

**Food(Fact)**

foodid

foodname

price

quantity

foodavail

cuisineid

ingid

chefid

**City(Dim)**

City\_id

Zipcode

State

Country

**Drink(Dim)**

drinkid

drinkname

price

quantity

drinkavail

**Ingredient(Dim)**

**Delivery(Fact)**

ingid

ingname

delid

delname

vehicleno

custid

empid

delcharge

deldate

deltime

**order1(Fact)**

ordid

totalcost

foodid

drinkid

delid

**Payment(Fact)**

payid

paymethod

custid

ordid

3. Design a Data Warehouse for cab ride service like Uber, Lyft (Asked in Google for Data

Engineer role)

Ans:-

**SQL queries**

Q1. *Retrieve the set of cash payments that fall within the timestamp range of*

*recorded credit payments*

**WITH** credit\_pay\_ts\_min\_max (min\_pay\_ts, max\_pay\_ts) **AS**

(

**SELECT**

**MIN**(payment\_timestamp),

**MAX**(payment\_timestamp)

**FROM** payment

**WHERE** payment\_type **=** 'Credit'

)

**SELECT**

payment\_id,

payment\_timestamp,

total\_amount

**FROM** payment

**WHERE**

payment\_type **=** 'Cash' **AND**

payment\_timestamp **BETWEEN**

(**SELECT** min\_pay\_ts **FROM** credit\_pay\_ts\_min\_max) **AND**

(**SELECT** max\_pay\_ts **FROM** credit\_pay\_ts\_min\_max)

**ORDER** **BY** payment\_timestamp;

Q2. *Retrieve chef name and phone number whose chefid is equal to chefid*

*Ans:- Select chef\_name and phone\_number*

*from chef where chefid=chefid;*

**Snowflake Schema Design for**  **cab ride service**

**Cab license(Dim)**

**Payments(Fact)**

**Cabs(Dim)**

**Customer(Dim)**

Starting\_date

Expiry\_date

Cab\_license\_no

Country\_name\_on\_license

Payment\_id

Type

Base\_rate

Surge\_rate

Tip\_amount

Total\_amount

Transaction\_id

Cab\_id

Driver\_id

Cab\_make

Cab\_model

Cab\_license

Cab\_plate\_no

Cab\_type

Base\_rate

Customer\_id

Customer\_name

Customer\_email

Address

Phone\_number

Joined\_date

**Driver(Dim)**

**Document category(Dim)**

**Trips(Fact)**

**Documents(Dim)**

Trip\_id

Driver\_id

Customer\_id

Cab\_id

Device\_id

Trip\_requested\_timestamp

Start\_location\_id

End\_location\_id

Trip\_start\_timestamp

Trip\_end\_timestamp

Wait\_time

Customer\_rating

Driver\_rating

Payment\_id

Trip\_status(0-cancelled, 1-in progress, 2-completed)

Driver\_id

Driver\_name

Address

Email

Phone\_number

Joined\_date

Current\_cab\_id

Driver\_license\_no

Doc\_category\_id

Name

Details

Doc\_id

Doc\_name

Driver\_id

Doc\_category

Document\_code

Country

Expiration\_date

**Driver license(Dim)**

Starting\_date

Expiry\_date

Driver\_license\_no

Country\_name\_on\_license

**Locations(Dim)**

Location\_id

Landmark\_city

Landmark\_state

Landmark\_country

Landmark\_name

Street\_name

House\_no

4. Design a Data Warehouse for Restaurent table booking app like Dineout (Asked in

McKinsey for Consultant Data Engineer role)

Ans:-

Create table restaurant

(

RID Number(8) Constraint RID Primary key,

Rname varchar(20),Contactno Number(11)

);

Create table customer

(

Cusid number(8) Constraint cus\_pk primary key,

Cusname varchar2(10),CNTNo Number(11), RID number(8),

Constraint fk\_pk Foreign key(RID) references restaurant(RID)

);

Create table restaurant\_info

(

Rname varchar2(20) Constraint RN Primary key,

Address varchar2(20)

);

Create table waiter

(

WID Number(8) Constraint W\_PK Primary key,

Wname varchar2(10),

cusid number(8),

order\_number number(8),

Constraint Ck\_pk Foreign key(cusid) references customer(cusid),

Constraint Ok\_pk Foreign key(order\_no) references Order(Order\_no)

);

Create table order

(

Order\_no number(8) Constraint OR\_pk primary key,

No\_of\_item number(4)

);

Create table order\_info

(

No\_of\_item number(4) Constraint No\_Pk primary key,

Order\_time varchar2(20),

Table\_no number(4)

);

Create table food

(

Food\_no number(8) Constraint Fo\_pk primary key,

Quantity number(4),

Description varchar2(20),

Order\_no number(8),

);

Create table food\_details

(

Food\_no number(8),

Quantity number(2),

Price number(5),

Constraint FD\_pk Foreign key (Food\_no) references food(food\_no)

);

Create table chef

(

Chef\_id number(8) Constraint Chef\_pk Not null,

Chefname varchar2(10),

Order\_no number(8),

Chef\_details varchar(50)

);

Create table bill

(

Bill\_no number(8) Constraint Bill\_pk Primary key,

Price number(4),

Order\_DTL varchar2(20),

Cus\_id number(8),

);

Create table bill\_details

(

Price varchar2(15) Constraint PC\_pk primary key,

Food\_name varchar2(15)

);

**SQL queries**

Q1. Display the customers name and contact no. Who goes La Bamba

Ans:- Select Cusname,CNTNo from customer where RID=(Select RID From restaurant where Rname=’LA Bamba’);

Q2. Display waiter name who takes order from sadia

Ans:- Select wname from waiter where cusid=(Select cusid from customer where cusname=’sadia’);

Q3. Display customer name who order sizzling prawn

Ans:- Select Cus\_name from customer where cus\_id in

(Select cusid from waiter where

Order\_no=(Select Order\_no from food where description=’sizzling prawn’));

Q4. Display waiters who works in La bamba

Ans:- Select WID,Wname from waiter where cusid in

(Select Cus\_id from customer where

RID=(Select RID from restaurant where Rname=’La bamba’));

Q5. Display customer name,contact no and restaurant name

Ans:- Select C.Cus\_name,C.CNTNo,R.Rname from customer C, restaurant R, where C.RID=R.RID;

Q6. Display waiter name who takes order

Ans:- Select W.Wname from waiter W, food F where W.Order\_no=F.Order\_no;

Q7. Display foods,food\_no, which ordered by customers

Ans:- Select F.description,F.food\_no,W.Cus\_id From food F, waiter W where

F.Order\_no=W.Order\_no;

**Snowflake Schema Design for**  **Restaurant table booking app**

**Table(Dim)**

**Order\_info(Dim)**

**Customer(Fact)**

**Restaurant(Dim)**

Table\_no

Table\_order

Booked\_table

No\_of\_item

Order\_time

Table\_no

Cusid

Cusname

CNTNo

RID

RID

Rname

Contactno

**Food(Dim)**

**Restaurant\_info(Dim)**

Food\_no

Quantity

Description

Order\_no

**Waiter(Fact)**

WID

Wname

cusid

order\_no

Rname

Address

**Order(Dim)**

Order\_no

No\_of\_item

**Chef details(Dim)**

**Chef(Dim)**

Chef\_id

Salary

Experience

Joining\_date

Chef\_id

Chefname

Order\_no

Chef\_details

**Food\_details(Fact)**

**Bill(Dim)**

Food\_no

Quantity

Price

Bill\_no

Price

Order\_DTL

Cus\_id

**Bill\_details(Dim)**

**Order Details(Dim)**

Price

Food\_name

Cus\_id

Food\_name

Food\_quantity

No\_of\_foodorder

Table\_no

5. Design a Data Warehouse for Covid Vaccination Application (Asked in Livsapce for

Data Engineer role)

Ans:-

CREATE TABLE Location

(

pincode numeric(6) PRIMARY KEY,

area varchar(30) NOT NULL,

city varchar(20) NOT NULL,

state varchar(20) NOT NULL

);

CREATE TABLE Inventory

(

I\_id int PRIMARY KEY AUTO\_INCREMENT,

I\_name varchar(20) NOT NULL,

I\_contactno numeric(10),

I\_address numeric(6) NOT NULL,

);

CREATE TABLE Vaccine

(

V\_name varchar(20) PRIMARY KEY,

V\_company varchar(20) NOT NULL,

V\_cost float NOT NULL

);

CREATE TABLE Hospital

(

H\_id int AUTO\_INCREMENT PRIMARY KEY,

H\_name varchar(30) NOT NULL,

H\_pwd varchar(200),

H\_contactno numeric(10),

H\_type char(1) NOT NULL CHECK (H\_type='G' OR H\_type='P'),

H\_address numeric(6) NOT NULL,

H\_email varchar(30),

H\_vac varchar(20),

quaran\_room\_no int,

);

CREATE TABLE Supplies

(

S\_id int auto\_increment primary key,

S\_hospital int,

S\_inventory int,

S\_quantity numeric,

S\_time timestamp,

Foreign key (S\_hospital) references hospital(h\_id) on delete cascade on update cascade,

Foreign key (S\_inventory) references inventory(i\_id) on delete cascade on update cascade

);

CREATE TABLE Person

(

P\_id int PRIMARY KEY AUTO\_INCREMENT,

P\_name varchar(30) NOT NULL,

P\_Gender char(20) NOT NULL,

P\_DOB DATE NOT NULL,

P\_contactno numeric(10),

P\_address numeric(6),

P\_email varchar(30),

No\_of\_vaccine\_dose\_taken int

);

CREATE TABLE Doctor

(

D\_id int PRIMARY KEY,

D\_dept varchar(20) NOT NULL,

FOREIGN KEY (D\_id) REFERENCES Person(P\_id) ON DELETE CASCADE ON UPDATE CASCADE

);

CREATE TABLE Vaccinates

(

P int,

Hosp int,

Date\_first DATE,

Date\_second DATE,

PRIMARY KEY (P, Hosp),

FOREIGN KEY (P) REFERENCES Person(P\_id) ON DELETE CASCADE ON UPDATE CASCADE,

FOREIGN KEY (Hosp) REFERENCES Hospital(H\_id) ON DELETE CASCADE ON UPDATE CASCADE

);

|  |
| --- |
|  |
|  |  |

**Snowflake Schema Design for**  **Covid Vaccination Application**

**Vaccine company(Dim)**

**Vaccine(Dim)**

**Supplies(Fact)**

**Location(Dim)**

V\_name

Vaccine\_lab

Quantity\_of\_vaccine

Supplied\_vaccine

Unsupplied\_vaccine

V\_name

V\_company

V\_cost

S\_id

S\_hospital

S\_inventory

S\_quantity

S\_time

h\_id

i\_id

pincode

area

city

state

**Quarantine Room(Dim)**

**Hospital(Dim)**

**Inventory(Dim)**

Quaran\_room\_no

Alloted\_room

Room\_cost

Available\_room

H\_id

H\_name

H\_pwd

H\_contactno

H\_type

H\_address

H\_email

H\_vac

quaran\_room\_no

**Doctor(Fact)**

I\_id

I\_name

I\_contactno

I\_address

D\_id

D\_dept

P\_id

P\_id

No\_of\_vaccine\_dose\_taken

Date\_of\_vaccine\_taken

Vaccine\_dose\_no

**Vaccine doses(Dim)**

P

Hosp

Date\_first

Date\_second

P\_id

H\_id

**Vaccinates(Fact)**

P\_id

P\_name

P\_Gender

P\_DOB

P\_contactno

P\_address

P\_email

No\_of\_vaccine\_dose\_taken

**Person(Dim)**

**SQL queries**

Q1. Adds the new amount of vaccines ordered from inventory in quaran\_room in hospital table.

Ans:- CREATE OR REPLACE

TRIGGER update\_vacc\_quant\_hosp

AFTER INSERT ON supplies

FOR EACH ROW

update hospital set quant\_rem = quant\_rem + new.s\_quantity where h\_id = new.s\_hospital;

Q2. *Retrieve Hospital name and hospital vaccine whose address is equal to Jp nagar,Bangalore*

*Ans:- Select H\_name,H\_vac*

*from Hospital*

*where address=’Jp nagar,Bangalore’;*