1. **Based in this OLTP model database, please design (a. star schema, b. snowflake, c. fact constellation schema)**
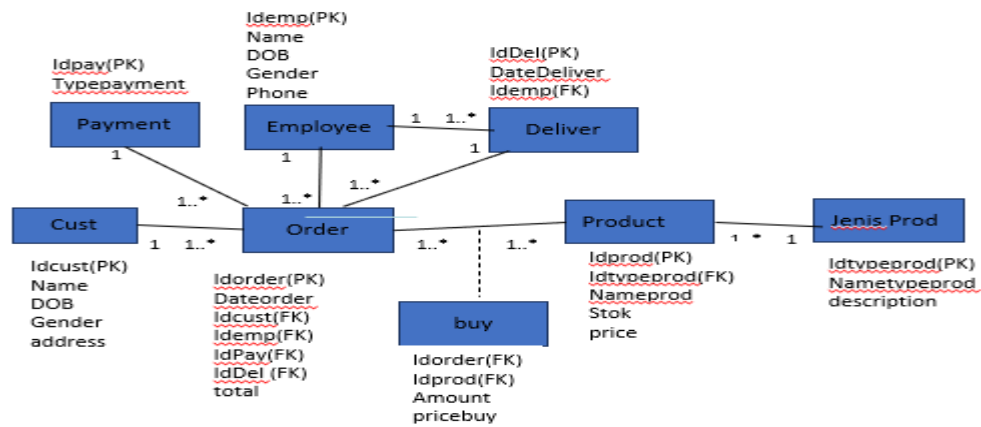
Answer:

a) Star Schema
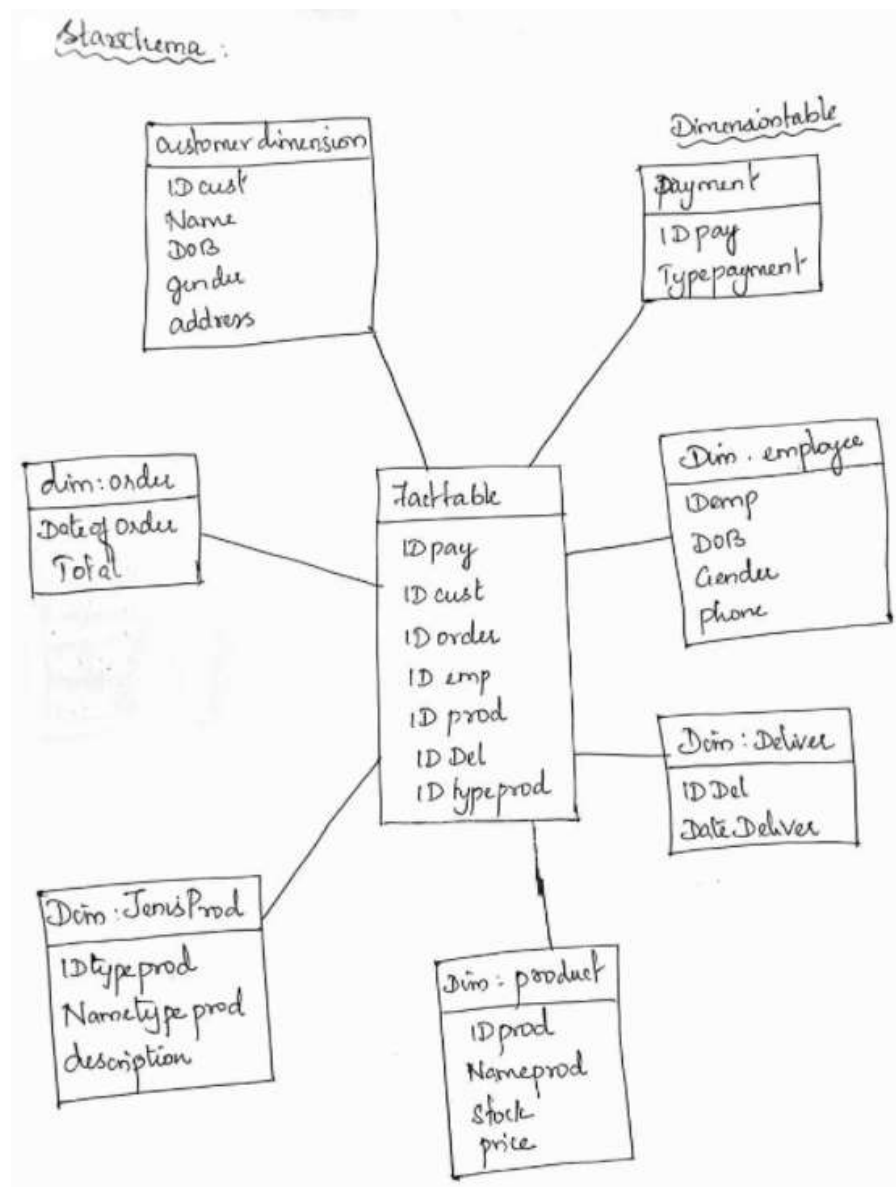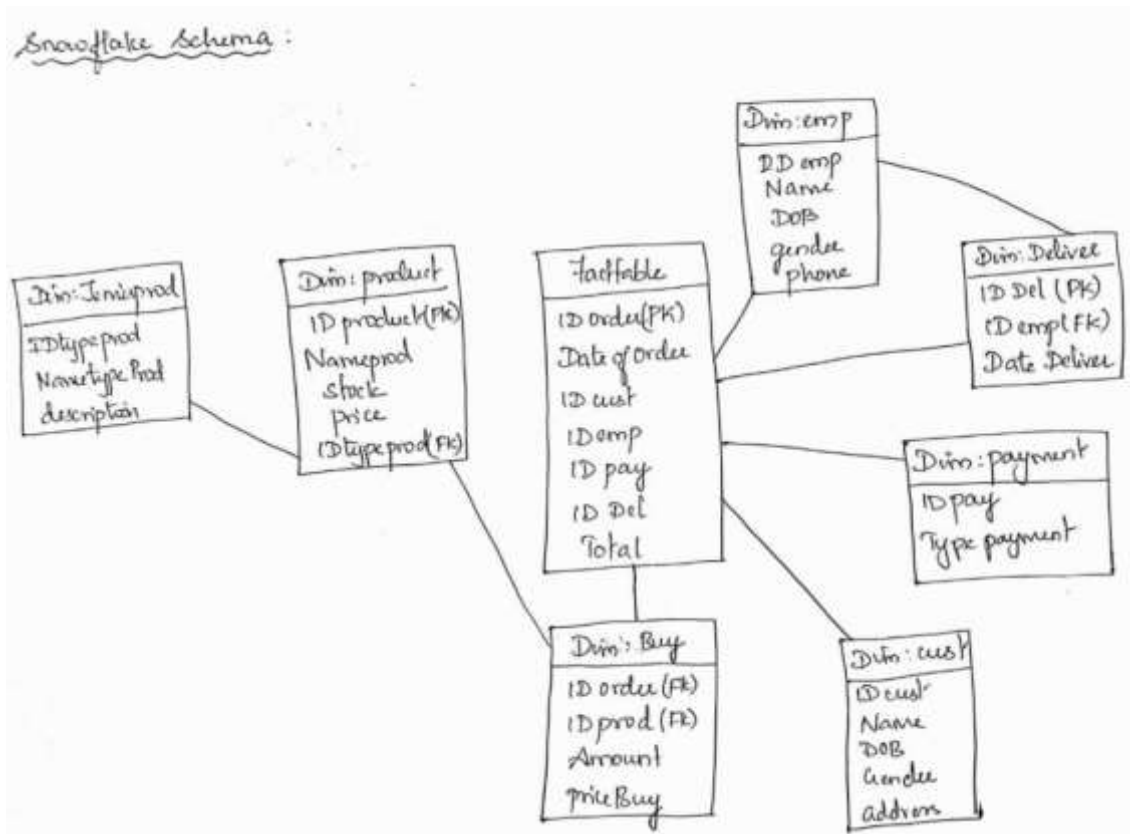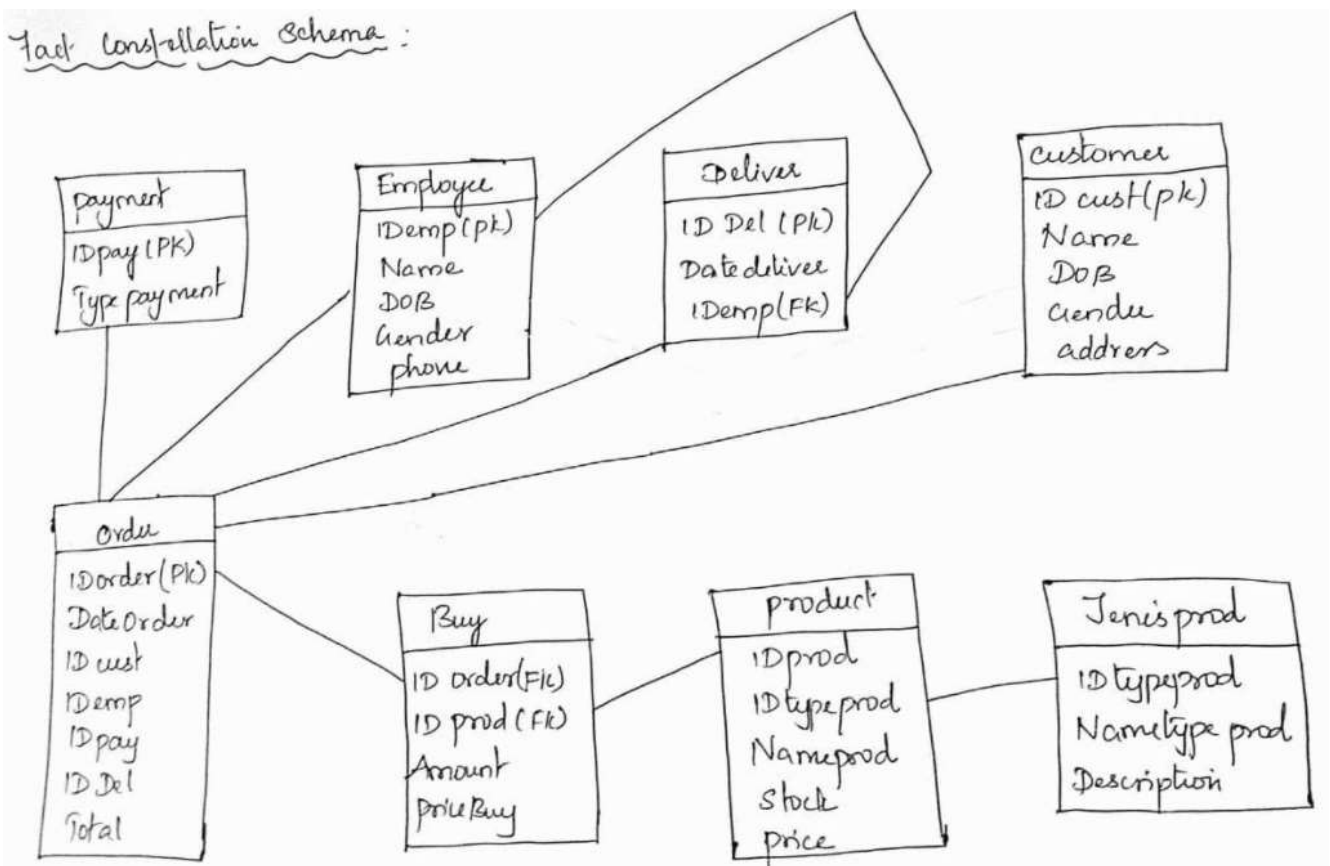
NAME : Edward   Course : Advanced Database Systems
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CLASS : LTY-1   Faculty / Department : School of Computer Science

b) Snowflake Schema

c) Fact Constellation Schema

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2. **What the differences between Data Warehouse and Data Mart?**

Answer:

Data Mart	Data Warehouse
Deal with a single subject area like finance, marketing, or operation etc.	Deal with more than once subject like a range of subject areas together.
Info is often in summarized nature.	Info is made detailed as possible.
Easily built by a lone software engineer.	Requires a group of software engineers.
Confined only to the department wise data.	Comprised of the whole enterprise data.
Concentrated on a dimensional model.	necessarily made of dimensional models.
Star schema and snowflake schema are used.	Fact constellation schema is used.
Highly denormalization takes place	Lightly denormalization takes place.

References:

Kimball, R., & Ross, M (2011). The data warehouse toolkit: the complete guide to dimensional modelling. : John Wiley & Sons.

3. **What do you understanding regarding with term of non-volatile in data warehouse characteristic?**

Answer:

Non-volatile means that once entered the data warehouse, data should not change because the purpose of a data warehouse is to enable to analyse what has occurred where it is kept separate from the operational database and therefore frequent changes in operational database is not reflected in the data warehouse.

References:

Vaisman, A., & Zimányi, E. (2014). Data Warehouse Systems: Design and Implementation. : Springer.

4. **What the difference between normalized and unnormalized database?**

Answer:

Normalized Database	Unnormalized Databased
Optimize the uses of disk spaces.	Do not optimize the disk spaces.
Number of tables is increased.	Number of tables in decreased.
Redundancy is reduced or eliminated.	Redundancy is added/permitted.
Data integrity is maintained.	Data integrity is not maintained.
Data are stored in set schema.	Data are combined to execute the query quickly.

References:

Kimball, R., & Ross, M (2011). The data warehouse toolkit: the complete guide to dimensional modelling. : John Wiley & Sons.

5. **Can we apply Data Warehouse on unstructured data?**

Answer:

Yes, in data warehousing the data be it unstructured or structured can be used for reporting and data analysis as well which is important as it is the core of business intelligence because the integration of data to several information and data coming from different sources being another important factor makes it important to be used.

One of the example of data warehouse which contains unstructured data such as Supermarket details, Clothing store etc. Users can be multiple and random for any such above mentioned information's. The information from other sources could be the information from a retailer, or online requirement of goods with respect to the seller / vendor because these are the centralized data storage system which helps the business to integrate the data from multiple applications and sources to one specific location.

References:

Vaisman, A., & Zimányi, E. (2014). Data Warehouse Systems: Design and Implementation. : Springer.

6. How many DATA WAREHOUSE DEVELOPMENT METHODOLOGIES do you know and what are they? And explain each of them!

Answer:

	Data Driven	User Driven	Goal Driven
Basic Approach	Bottom-up	Bottom-up	Top-down
Supported Management Method	Taylorism Classical School of Management	No Company is culture reflected	Management by Objectives
Project Support	None	Department	Top Management
Application Area / Requirement Domain	Data Exploration and Data Mining	Raise the Acceptance of a System	Foundation for Decision Support
Targeting Organisational Level	Operational Partly Tactical	Depends on the Group of Interview Partners	Strategic Tactical Operational
Focus	Short-Term Focus	Short-Term Focus	Long-Term Focus
Extent of End User Involvement	None	High	Moderate
Project Duration	Low	Very High	High
Skills of Project Members	Data Warehouse Designer	Moderator Data Warehouse Designer	Moderator Economist Data Warehouse Designer
Number of Measures	Many	Many	Few
Type of Measures	Non-Financial and Quantitative Time-Based and Frequency-Based	Non-Financial and Quantitative Time-Based and Frequency-Based	Balanced Financial and Non-Financial as well as Qualitative and Quantitative
Level of Granularity	Low	Low	High
Number of Dimensions	Few	Many	Few
Type of Dimensions	Represents the Basic Structure of the Application	Represents the Basic Structure of the Application and external Sources	Represents the Strategic Building Blocks of the Organisation
Number of Source Systems	Low	Moderate	High
Longevity / Stability of Data Model	Long	Short	Long
Cost	Low	High	High

References:

Kimball, R., & Ross, M (2011). The data warehouse toolkit: the complete guide to dimensional modelling. : John Wiley & Sons.

7. Give examples of 3 types of slowly changing dimensions!

Answer:

a) Type 1

➔ Overwrites the historical information and erases the old data for the database and only dimension change that happens in a form of corrections and there is no necessity for historical reporting.

Member ID	Client Name	Country	Phone Number
123456789	John Doe	Indonesia	+623194556024

b) Type 2

➔ Saves the historical info by including a brand-new row and keeps a track of historical details with several rows and columns provided in the dimension table.

Member ID	Client Name	Country	Phone Number	Start Date	End Date
214365879	John	Indonesia	+623194556024	16/04/2000	22/12/2004
896745231	Doe	Indonesia	+6283870989358	05/04/2000	NA

The complete historical data is retained. If the importance of a selected attribute changes, the present record is closed. A brand-new report is produced with the changed information values and this brand-new record will become the present record.

c) Type 3

➔ Each record saves/stores the previous value as well as the present value of the selected feature and if the valuation of any of the selected characteristics changes, the present value is kept as the old value as well as the new value will become the present value.

| Member ID	Client Name	Current Country	Previous Country
591827364	Doe John	Indonesia	Japan

References:

Kimball, R., & Ross, M (2011). The data warehouse toolkit: the complete guide to dimensional modelling. : John Wiley & Sons.

Vaisman, A., & Zimányi, E. (2014). Data Warehouse Systems: Design and Implementation. : Springer.

8. What do you know regarding with factless fact table? Please give an example factless fact table !

Answer:

It is a fact table that does not have any measures and it is intersection of dimension and contains dimension keys for describing events and coverage, meaning tables contain information that nothing has happened.
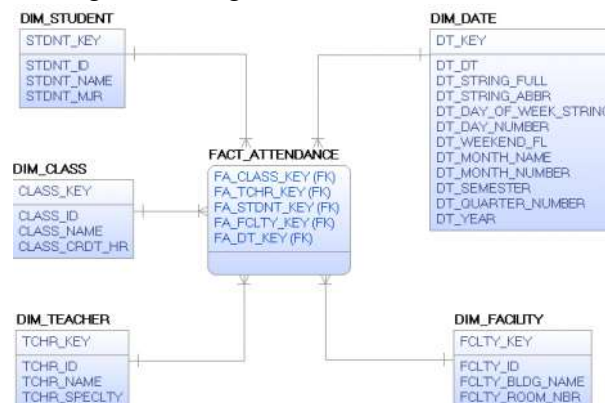
There is nothing that can measure about a student's attendance at a class. The student was there, and the attendance was recorded, or the student was not there, and no record is recorded.

References:

Kimball, R., & Ross, M (2011). The data warehouse toolkit: the complete guide to dimensional modelling. : John Wiley & Sons.