Database Systems

Assignment # 01

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BSCS-4B

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CREATING AN ENTITY-RELATIONSHP DIAGRAM:
UPS prides itself on having up-to-date information on the processing and current location of each shipped item. To do this, UPS relies on a company-wide information system. Shipped items are the heart of the UPS product tracking information system. Shipped items can be characterized by item number (unique), weight, dimensions, insurance amount, destination, and final delivery date. Shipped items are received into the UPS system at a single retail center. Retail centers are characterized by their type, uniqueID, and address. Shipped items make their way to their destination via one or more standard UPS transportation events (i.e., flights, truck deliveries). These transportation events are characterized by a unique scheduleNumber, a type (e.g., flight, truck), and a deliveryRoute. Please create an Entity Relationship diagram that captures this information about the UPS system. Be certain to indicate identifiers and cardinality constraints.

Answer:

ERD for the above scenario has been given in the end

The scenario has been converted into the following relational Model as shown below.

Entity	Attributes
RETAIL_CENTRE	[**RETAIL_CENTRE_ID**, RETAIL_CENTRE_TYPE, ADDRESS]
TRANSPORTATION_TYPE	[**TRANSPORTATION_TYPE_ID**, TRANSPORTATION_TYPE, MAXIMUM_WEIGHT]
TRANSPORTATION_EVENT	[**SCHEDULE_NUMBER**, *TRANSPORTATION_TYPE_ID*$_{[FK]}$, DELVERY_ROUTE]
CUSTOMER	[**CUSTOMER_ID**, CUSTOMER_NAME, CUSTOMER_ADDRESS, PHONE]
SHIPPED_ITEMS	[**ITEM_NO**, WEIGHT_CARGO, DIMENSIONS, INSURED_AMOUNT, *RETAIL_SOURCE*$_{[FK]}$, *RETAIL__DESTINATION*$_{[FK]}$, DELIVERY_DATE, *SCHEDULE_NUMBER*$_{[FK]}$, *CUSTOMER_ID*$_{[FK]}$]

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Bold and Underlined attributes are called **primary keys** which uniquely identify a row in the table.
For example, [**RETAIL_CENTRE_ID**, is **primary key** in the RETAIL_CENTRE table .

The attributes which are italicized are used here to represent **foreign keys**.
A ***foreign key*** is a set of attributes in a table that refers to the primary key of another table. The ***foreign key*** links these two tables.
For example, *RETAIL_SOURCE in SHIPPED_ITEMS table is called foreign* key which is derived from parent table **RETAIL_CENTRE_ID** from RETAIL_CENTRE table.

Here the relationship between the RETAIL_CENTRE and the *SHIPPED_ITEMS table* is called one to many.
Cardinality refers to the relationship between two tables
Cardinality between RETAIL_CENTRE and SHIPPED_ITEMS is one to many.
Cardinality between TRANSPORTATION_TYPE and TRANSPORTATION_EVENT is one to many.
Cardinality between CUSTOMER and SHIPPED_ITEMS is one to many.
Cardinality between TRANSPORTATION_EVENT and SHIPPED_ITEMS is one to many.

Index.
All Primary keys are indexed.

Strong and week entity
A strong entity is not dependent of any other entity in the schema. A strong entity will always have a primary key.
A weak entity is dependent on a strong entity to ensure its existence. Unlike a strong entity, a weak entity does not have any primary key.
In the above relational model, all entities have primary keys. So all are strong entities.
ERD will show

- all entities and relationships among them.
- All attributes for each entity are specified.
- The primary key for each entity is specified.
- Foreign keys (keys identifying the relationship between different entities) are specified.

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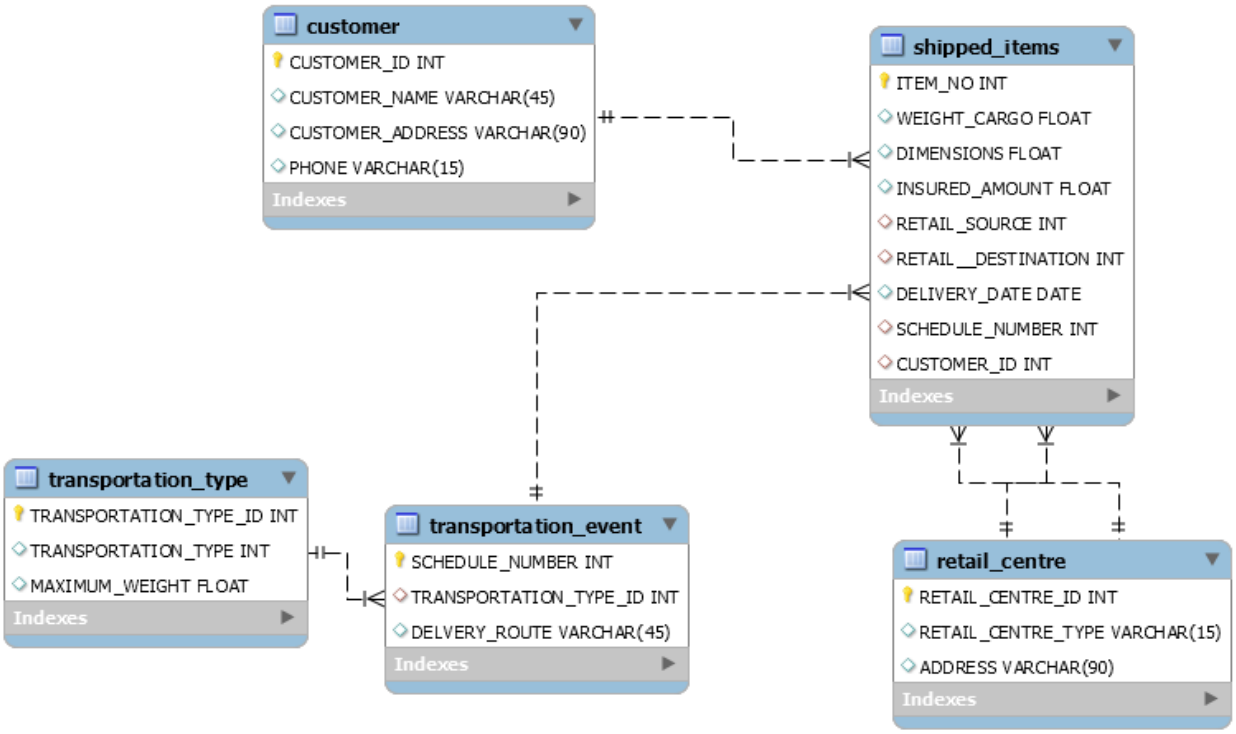
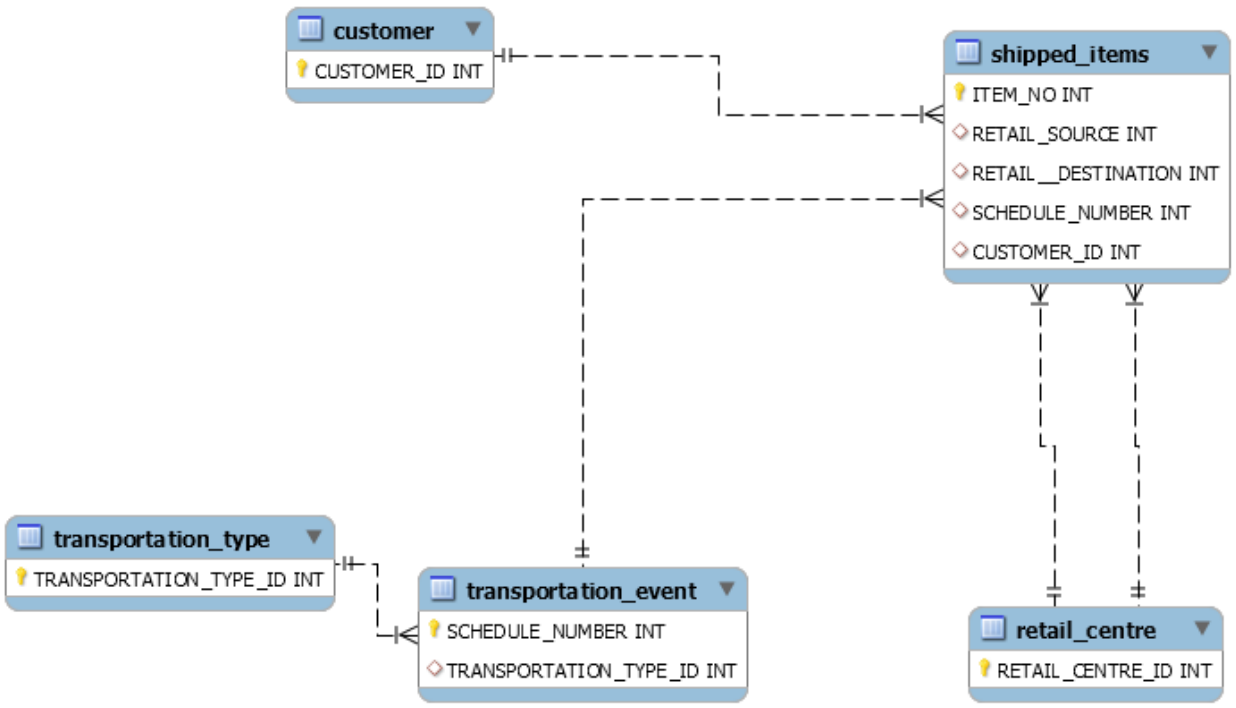
ERD(Using Mysql Workbench):



ERD showing only primary and foreign keys: