DATA BOOK FINAL SUBMISSION

Flower Shop Database

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PART 1: THE DATABASE NARRATIVE

1.DATABASE DESCRIPTION:

The flower shop management system is a critical management tool for every retail flower shop. This database holds details about customers, employees, orders placed, quantities of materials in stock, and details on the vendors, allowing administrators/employees to track the changes in the shop. The database serves as a repository to store the actions performed by the three primary actors—customers, employees, and vendors.

The Employee in the shop has their data stored in the EMPLOYEE table. A flower shop mainly consists of florists, salespersons, and shop helpers. Additionally, we have subtype entities FLORIST and SALES_ASSOCIATE to track the specifications as certification/ qualification details of florists and sales associates. These subtype entities follow the disjoint constraint and partial completeness. The entity CUSTOMER stores information about customers who make purchases from the flower shop, and the table VENDOR contains information about the vendors that supply the shop with its supplies.

An employee preferably a sales associate contacts the appropriate vendors to purchase supplies for the shop, such as flowers, hampers, etc. The salesperson retains a table with the purchase information for the materials on it. Additionally, florists employ these materials to create flower bouquets in accordance with customer requirements.

To purchase bouquets of flowers, a customer who visits the flower shop interacts with one or more of the employees, who then records the customer's order into a SALES_ORDER table, which is further used by the florists to deliver the desired bouquet when it has been arranged. The details on the transactions credited and debited to the flower shop account is recorded in the entity PAYMENT. For instance, when all the materials purchased from the vendors are delivered to the shop and when customers have paid for the bouquets which were sold to them.

This flower shop database could be of great use to surge the profit of the flower shop by analyzing all the records associated with the flower shop. Namely, on reviewing the customer's prior order histories, the administrative/employee could predict customer patterns and preferences, allowing the shop authorities to offer them diverse options that suit their fondness. The database could be used to analyze the busiest shopping occasions, so the shop could offer great deals on the bouquets during this period and be prepared with larger varied supplies. The sales could be profitable when the amount paid on supplies is brought down, this can be achieved by querying or analyzing the entities VENDOR and MATERIAL, to detect the vendors who supply the same products with good quality at a lower rate.

Thus, this flower shop database management tool, makes the shop well organized with a higher accountability and offers up great way of maintaining customer relationships including their preferences and also aids in planning the expansions of the business.

2.DATA DICTIONARY:

ENTITY	ATTRIBUTE NAME	ENTITY CONTENTS	DATA TYPE	FORMAT	RANGE	REQUIRED	PK or FK	FK REFERENCE TABLE
CUSTOMER	CUS_ID	Customer Code	INT(5)	99999	10001-99999	Y	PK	
	CUS_FNAME	Customer first name	VARCHAR(20)	Xxxxxx		Y		
	CUS_LNAME	Customer last name	VARCHAR(20)	Xxxxxx		Y		
	CUS_INITIAL	Customer initial	CHAR(1)	X				
	CUS_AREACODE	Customer area code	CHAR(3)	999				
	CUS_ PHONE	Customer phone number	CHAR(8)	999-9999				
EMPLOYEE	EMP_ID	Employee code	INT(3)	999	101-999	Y	PK	

ENTITY	ATTRIBUTE NAME	ENTITY CONTENTS	DATA TYPE	FORMAT	RANGE	REQUIRED	PK or FK	FK REFERENCE TABLE
	EMP_FNAME	Employee first name	VARCHAR(20)	Xxxxxx		Y		
	EMP_LNAME	Employee last name	VARCHAR(20)	Xxxxxx		Y		
	EMP_INITIAL	Employee initial	CHAR(1)	X				
	EMP_AREACODE	Employee area code	CHAR(3)	999		Y		
	EMP_ PHONE	Employee phone	CHAR(8)	999-9999		Y		
	EMP_DOJ	Employee Date of joining	DATE	yyyy-mm-dd		Y		
	EMP_SALARY	Employee salary	FLOAT(7,2)	99999.99		Y		
	EMP_ROLECAT	Employee role category	VARCHAR(15)	Xxxxx		Y		

ENTITY	ATTRIBUTE NAME	ENTITY CONTENTS	DATA TYPE	FORMAT	RANGE	REQUIRED	PK or FK	FK REFERENCE TABLE
FLORIST	EMP_ID	Employee code	INT(3)	999	101-999	Y	PK/FK	EMPLOYEE
	FL_TITLE	Florist job title	VARCHAR(25)	Xxxxx		Y		
	FL_CERTIFICATION	Florist certification name	VARCHAR(60)	Xxxx				
	FL_CERT_DATE	Florist certification date	DATE	yyyy-mm-dd				
	FL_RATING	Florist work rating by customer	VARCHAR(3)	9.9				
SALES_ASSOCIATE	EMP_ID	Employee code	INT(3)	999	101-999	Y	PK/FK	EMPLOYEE
	SL_JOB_TITLE	Sales job title	VARCHAR(25)	Xxxxx		Y		

ENTITY	ATTRIBUTE NAME	ENTITY CONTENTS	DATA TYPE	FORMAT	RANGE	REQUIRED	PK or FK	FK REFERENCE TABLE
	SL_QUALIFICATION	Sales employee qualification	VARCHAR(40)	Xxxxx				
	SL_YEARS_EXP	Years of experience in sales	VARCHAR(20)	99 Xxx				
	SL_EMPTYPE	Sales Employment type (Full/part time)	VARCHAR(9)	Xxxxx				
PAYMENT	P_ID	Payment identifier	INT(9)	99999999	10000000-99999999	Y	PK	
	P_TYPE	Payment type	VARCHAR(8)	Xxxxx		Y		
	P_STATUS	Payment status	VARCHAR(10)	Xxxxx		Y		

ENTITY	ATTRIBUTE NAME	ENTITY CONTENTS	DATA TYPE	FORMAT	RANGE	REQUIRED	PK or FK	FK REFERENCE TABLE
	P_AMOUNT	Amount paid	FLOAT(9,2)	99999.99		Y		
	P_DATE	Date of payment	DATE	yyyy-mm-dd		Y		
SALES_ORDER	SORDER_ID	Sales order identifier	INT(6)	999999	100000-999999	Y	PK	
	CUS_ID	Customer code	INT(5)	99999		Y	FK	CUSTOMER
	EMP_ID	Employee code	INT(3)	999		Y	FK	EMPLOYEE
	SORDER_DATE	Date of sales order	DATE	yyyy-mm-dd		Y		
	SORDER_STATUS	sales order status	VARCHAR(10)	Xxxxx		Y		
	P_ID	Payment identifier	INT(9)	999999999			FK	PAYMENT

ENTITY	ATTRIBUTE NAME	ENTITY CONTENTS	DATA TYPE	FORMAT	RANGE	REQUIRED	PK or FK	FK REFERENCE TABLE
VENDOR	V_ID	Vendor code	INT(4)	9999	1000-9999	Y	PK	
	V_NAME	Vendor name	VARCHAR(30)	Xxxxxx		Y		
	V_STREET	Vendor street	VARCHAR(30)	Xxxxxx				
	V_CITY	Vendor city	VARCHAR(30)	Xxxxxx				
	V_STATE	Vendor state	CHAR(2)	XX				
	V_ZIP	Vendor zip code	CHAR(5)	99999		Y		
	V_AREACODE	Vendor area code	CHAR(3)	999		Y		
	V_PHONE	Vendor phone	CHAR(8)	999-9999		Y		
PURCHASE_ORDER	PORDER_ID	Purchase identifier	INT(7)	9999999	1000000-9999999	Y	PK	

ENTITY	ATTRIBUTE NAME	ENTITY CONTENTS	DATA TYPE	FORMAT	RANGE	REQUIRED	PK or FK	FK REFERENCE TABLE
	PORDER_DATE	Purchase order date	DATE	yyyy-mm-dd		Y		
	PORDER_STATUS	Purchase order status	VARCHAR(10)	Xxxxx		Y		
	EMP_ID	Employee code	INT(3)	999		Y	FK	EMPLOYEE
	V_ID	Vendor code	INT(4)	9999	1000-9999	Y	FK	VENDOR
	P_ID	Payment identifier	INT(9)	999999999		Y	FK	PAYMENT
MATERIAL	MAT_ID	Material identifier	CHAR(4)	X999	A100-Z999	Y	PK	
	MAT_NAME	Material name	VARCHAR(25)	Xxxxxx		Y		
	MAT_TYPE	Material type	VARCHAR(15)	Xxxxxx		Y		

ENTITY	ATTRIBUTE NAME	ENTITY CONTENTS	DATA TYPE	FORMAT	RANGE	REQUIRED	PK or FK	FK REFERENCE TABLE
	MAT_COLOR	Material color	VARCHAR(15)	Xxxxxx				
	MAT_QTY_HAND	Material quantity on hand	INT	9999				
PURCHASE_LINE	PORDER_ID	Purchase identifier	INT(7)	9999999		Y	PK/FK	PURCHASE_ORDER
	MAT_ID	Material identifier	CHAR(4)	X999		Y	PK/FK	MATERIAL
	PLINE_QUANTITY	Ordered quantity	INT	999		Y		
	PLINE_RATE	Rate for purchase	FLOAT(6,2)	9999.99				
	PLINE_DATE	Material delivery date	DATE	yyyy-mm-dd				
BOUQUET	B_ID	Bouquet identifier	CHAR(3)	X99	A00-Z99	Y	PK	

ENTITY	ATTRIBUTE NAME	ENTITY CONTENTS	DATA TYPE	FORMAT	RANGE	REQUIRED	PK or FK	FK REFERENCE TABLE
	B_NAME	Bouquet name	VARCHAR(35)	Xxxxxx		Y		
	B_COLOR	Bouquet color	VARCHAR(15)	Xxxxxx				
	B_THEME	Bouquet theme	VARCHAR(15)	Xxxxxx				
	B_SIZE	Bouquet size	VARCHAR(15)	Xxxxxx		Y		
ARRANGE	B_ID	Bouquet identifier	CHAR(3)	X99		Y	PK/FK	BOUQUET
	MAT_ID	Material identifier	CHAR(4)	X999		Y	PK/FK	MATERIAL
	A_LASTING_TIME	Lasting time of arranged bouquet	VARCHAR(7)	99 Xxxxx				
	A_NO_OF_MAT	Number of	VARCHAR(3)	999				

ENTITY	ATTRIBUTE NAME	ENTITY CONTENTS	DATA TYPE	FORMAT	RANGE	REQUIRED	PK or FK	FK REFERENCE TABLE
		materials used						
	A_DESCRIPTION	Arrangement description	VARCHAR(35)	Xxxxxx				
SALES_LINE	B_ID	Bouquet identifier	CHAR(3)	X99		Y	PK/FK	BOUQUET
	SORDER_ID	Sales order identifier	INT(6)	999999		Y	PK/FK	SALES_ORDER
	SLINE_DATE	Bouquet Delivery date	DATE	yyyy-mm-dd				
	SLINE_NOB	Number of bouquets	INT	99		Y		
	SLINE_RATE	Rate of sales order	FLOAT(4,2)	9999.99				

***3.BUSINESS RULES*:**

RELATIONSHIP	TYPE OF RELATIONSHIP	BUSINESS RULE
CUSTOMER- SALES_ORDER	1:M	A CUSTOMER can place one or many SALES_ORDERS; but each SALES_ORDER is placed by only one CUSTOMER.
EMPLOYEE – SALES_ORDER	1:M	An EMPLOYEE can serve one or many SALES_ORDERS; but each SALES_ORDER is served by only one EMPLOYEE.
PAYMENT – SALES_ORDER	1:1	A PAYMENT is done for a single SALES_ORDER; each SALES_ORDER has only one PAYMENT.
SALES_ORDER -SALES_LINE	1:M	A SALES_ORDER includes one or many SALES_LINE; but each SALES_LINE is included in only one SALES_ORDER.
BOUQUET- SALES_LINE	1:M	A BOUQUET can be included in many SALES_LINES; each SALES_LINE can only include one BOUQUET.

SALES_ORDER - BOUQUET	M:N	A SALES_ORDER contains one or many BOUQUETS; A BOUQUET can be included in many SALES_ORDERS.
VENDOR- PURCHASE_ORDER	1:M	A VENDOR can be contacted for one or many PURCHASE_ORDERS; but each PURCHASE_ORDER is placed for only one VENDOR.
EMPLOYEE – PURCHASE_ORDER	1:M	An EMPLOYEE can place one or many PURCHASE_ORDERS; but each PURCHASE_ORDER is placed by only one EMPLOYEE.
PAYMENT – PURCHASE _ORDER	1:1	A PAYMENT is done for a single PURCHASE _ORDER; each PURCHASE _ORDER has only one PAYMENT.
PURCHASE_ORDER - PURCHASE _LINE	1:M	A PURCHASE _ORDER includes one or many PURCHASE _LINE; but each PURCHASE_LINE is included in only one PURCHASE_ORDER.
MATERIALS- PURCHASE _LINE	1:M	A MATERIAL can be purchased in many PURCHASE_LINES; each

		PURCHASE_LINE can only purchase one MATERIAL.
PURCHASE_ORDER - MATERIAL	M:N	A PURCHASE_ORDER contains one or many MATERIALS; A MATERIAL can be included in many PURCHASE_ORDERS.
BOUQUET - MATERIAL	M:N	A BOUQUET uses one or many MATERIALS; A MATERIAL can be used in many BOUQUETS.
CUSTOMER - EMPLOYEE	M:N	A CUSTOMER can be served by one or many EMPLOYEES; An EMPLOYEE can serve for many CUSTOMERS.
VENDOR-EMPLOYEE	M:N	A VENDOR can be contacted by one or many EMPLOYEES; An EMPLOYEE can contact many VENDORS.

4. ENTITY RELATIONSHIP MODEL (ERM) COMPONENTS

ENTITY	RELATIONSHIP	CONNECTIVITY	ENTITY
CUSTOMER	places	1:M	SALES_ORDER
EMPLOYEE	serves in	1:M	SALES_ORDER
PAYMENT	has	1:1	SALES_ORDER
SALES_ORDER	includes	M:N	BOUQUET
VENDOR	can be placed	1:M	PURCHASE_ORDER
EMPLOYEE	Can place	1:M	PURCHASE_ORDER
PAYMENT	Is done	1:1	PURCHASE_ORDER
PURCHASE_ORDER	includes	M:N	MATERIALS
BOUQUET	uses	M:N	MATERIALS
EMPLOYEE	serves	M:N	CUSTOMERS
VENDOR	is contacted	M:N	EMPLOYEE

NOTE:

SALES_LINE is the composite entity that implements the M:N relationship “SALES_ORDER includes BOUQUET”.

PURCHASE_LINE is the composite entity that implements the M:N relationship “PURCHASE_ORDER includes MATERIAL”.

ARRANGE is the composite entity that implements the M:N relationship “BOUQUETS uses MATERIAL”.

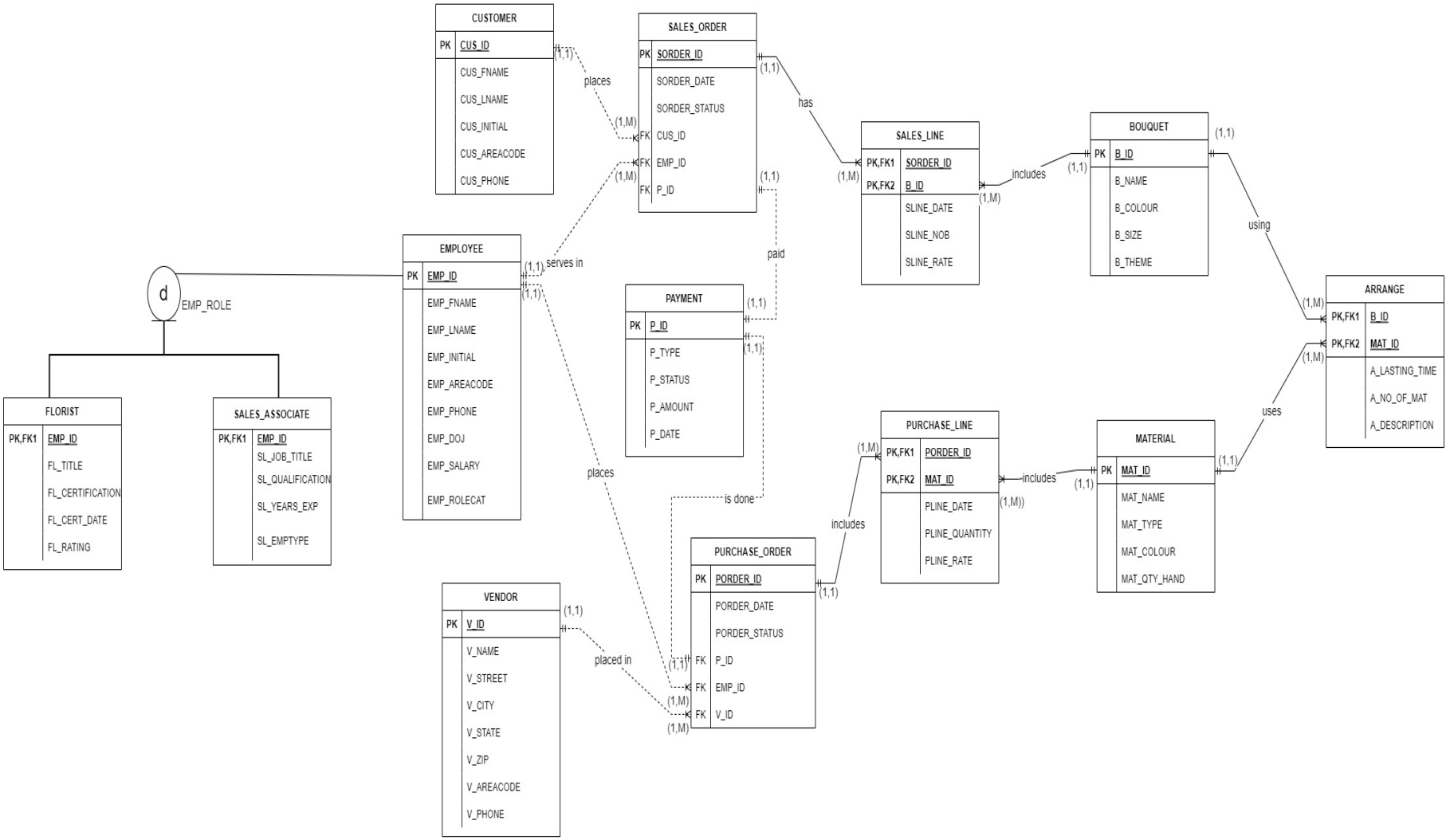
FLOURIST and SALES_ASSOCIATE are subtype of the class EMPLOYEE which are ‘disjoint’ and ‘partial’ in nature.

PART 2: THE ENTITY RELATIONSHIP DIAGRAM

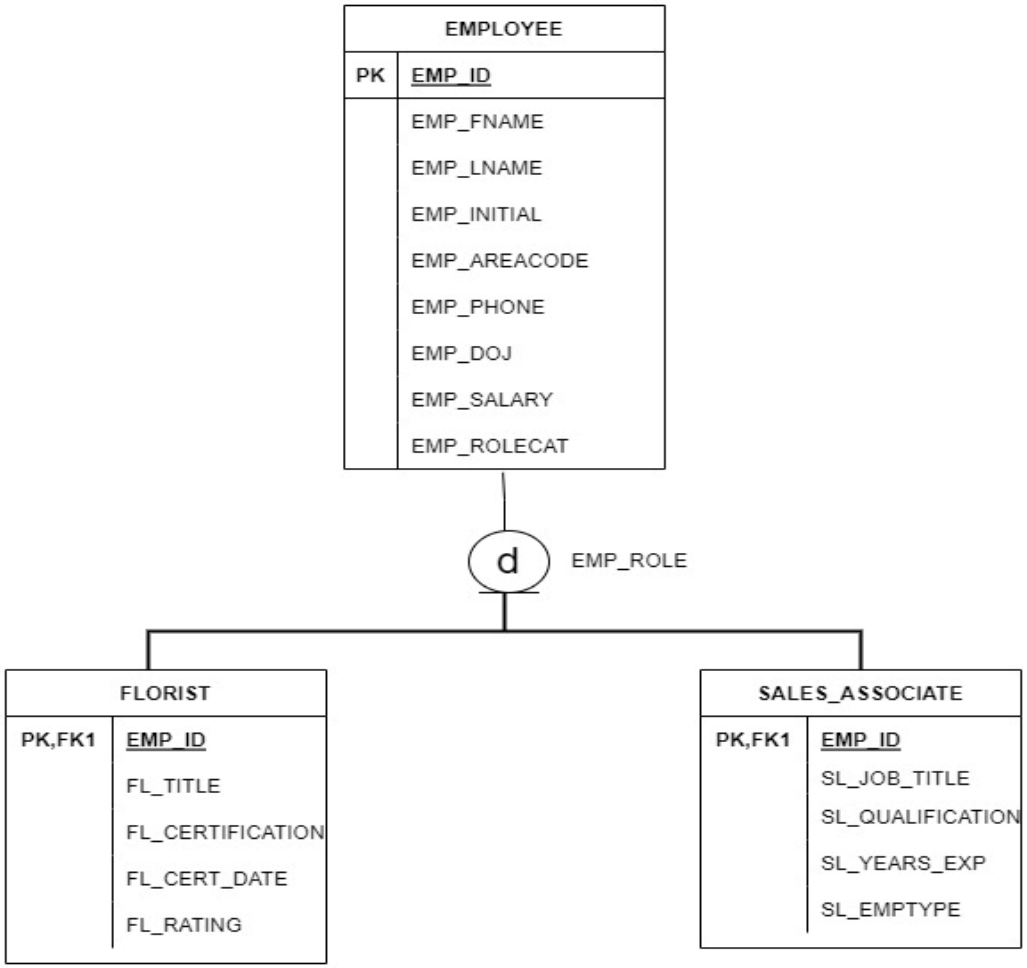
1.RELATIONAL SCHEMAS:

- CUSTOMER (**CUS_ID**, CUS_FNAME, CUS_LNAME, CUS_INITIAL, CUS_AREACODE, CUS_ PHONE)
- EMPLOYEE (**EMP_ID**, EMP_FNAME, EMP_LNAME, EMP_INITIAL, EMP_AREACODE, EMP_ PHONE, EMP_DOJ, EMP_SALARY, EMP_ROLECAT)
- FLORIST (**EMP_ID**, FL_TITLE, FL_CERTIFICATION, FL_CERT_DATE, FL_RATING)
- SALES_ASSOCIATE (**EMP_ID**, SL_JOB_TITLE, SL_QUALIFICATION, SL_YEARS_EXP, SL_EMPTYPE)
- PAYMENT (**P_ID**, P_TYPE, P_STATUS, P_AMOUNT, P_DATE)
- SALES_ORDER (**SORDER_ID**, SORDER_DATE, SORDER_STATUS, CUS_ID, EMP_ID, P_ID)
- VENDOR (**V_ID**, V_NAME, V_STREET, V_CITY, V_STATE, V_ZIP, V_AREACODE, V_PHONE,)
- PURCHASE_ORDER (**PORDER_ID**, PORDER_DATE, PORDER_STATUS, EMP_ID, V_ID, P_ID)
- MATERIAL (**MAT_ID**, MAT_NAME, MAT_TYPE, MAT_COLOR, MAT_QTY_HAND)
- PURCHASE_LINE (**PORDER_ID, MAT_ID**, PLINE_QUANTITY, PLINE_RATE, PLINE_DATE)
- BOUQUET (**B_ID**, B_NAME, B_COLOR, B_THEME, B_SIZE)
- ARRANGE (**B_ID, MAT_ID**, A_LASTING_TIME, A_NO_OF_MAT, A_DESCRIPTION)
- SALES_LINE (**B_ID, SORDER_ID**, SLINE_DATE, SLINE_NOB, SLINE_RATE)

2.CROW'S FOOT DIAGRAM OF ALL ENTITIES:



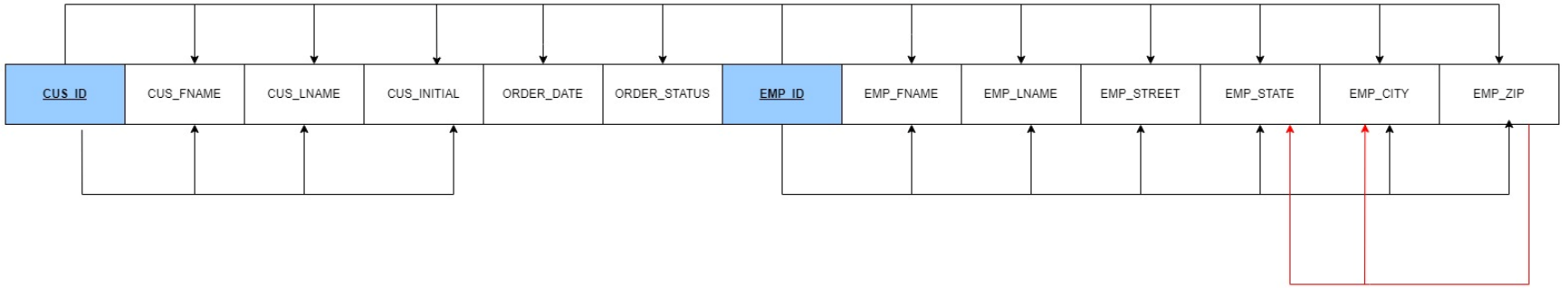
3.CROW'S FOOT DIAGRAM OF A SUBTYPE/SUPERTYPE RELATIONSHIP



4. NORMALIZED TABLE WALK-THROUGH

(Denormalized the existing tables to get a hypothetical table “Customer”.)

First Normal Form (1NF)



Relational Schema:

1NF (**CUS_ID, EMP_ID**, CUS_FNAME, CUS_LNAME, CUS_INITIAL, ORDER_DATE, ORDER_STATUS, EMP_FNAME, EMP_LNAME, EMP_STREET, EMP_CITY, EMP_STREET, EMP_ZIP)

Partial dependencies:

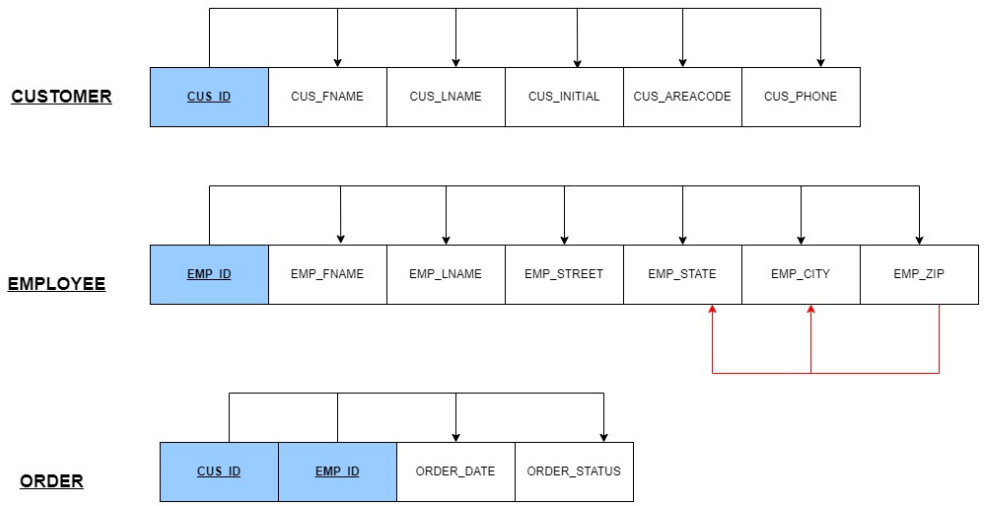
(**CUS_ID** -> CUS_FNAME, CUS_LNAME, CUS_INITIAL)

(**EMP_ID** -> EMP_FNAME, EMP_LNAME, EMP_STREET, EMP_CITY, EMP_STATE, EMP_ZIP)

Transitive Dependencies:

(EMP_ZIP -> EMP_CITY, EMP_STATE)

Second Normal Form (2NF)



Relational Schema:

CUSTOMER (**CUS_ID**->CUS_FNAME, CUS_LNAME, CUS_INITIAL, CUS_AREACODE, CUS_PHONE)

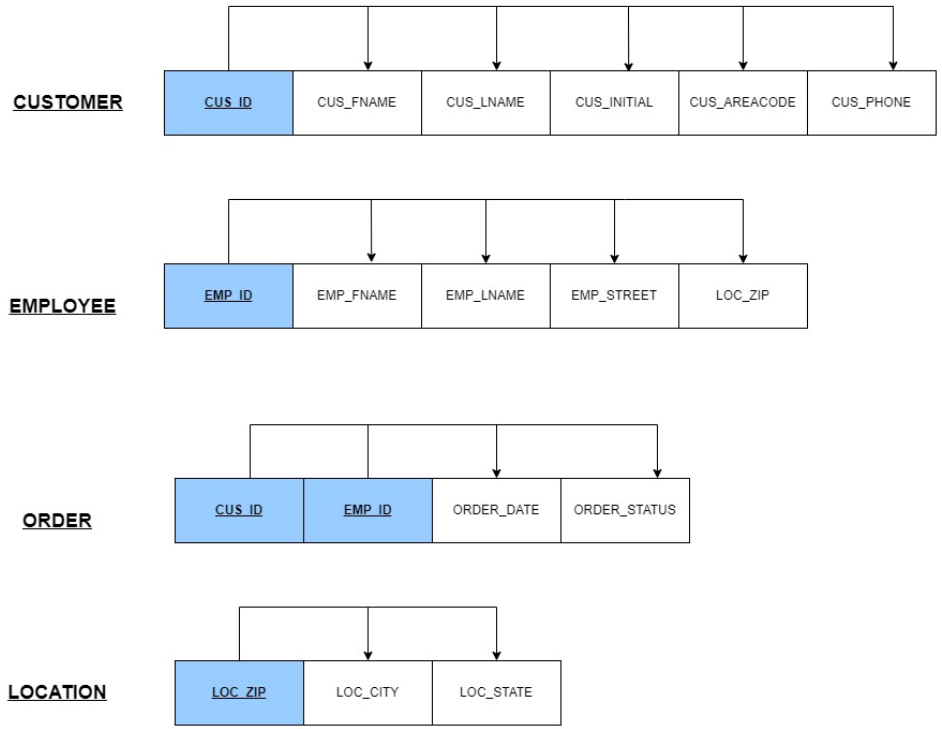
EMPLOYEE (**EMP_ID**-> EMP_FNAME, EMP_LNAME, EMP_STREET, EMP_CITY, EMP_STATE, EMP_ZIP

ORDER (**CUS_ID, EMP_ID**, ORDER_DATE, ORDER_STATUS)

Transitive Dependencies:

(EMP_ZIP -> EMP_CITY, EMP_STATE)

Third Normal Form (3NF)



Relational Schema:

CUSTOMER (**CUS_ID**->CUS_FNAME, CUS_LNAME, CUS_INITIAL, CUS_AREACODE, CUS_PHONE)

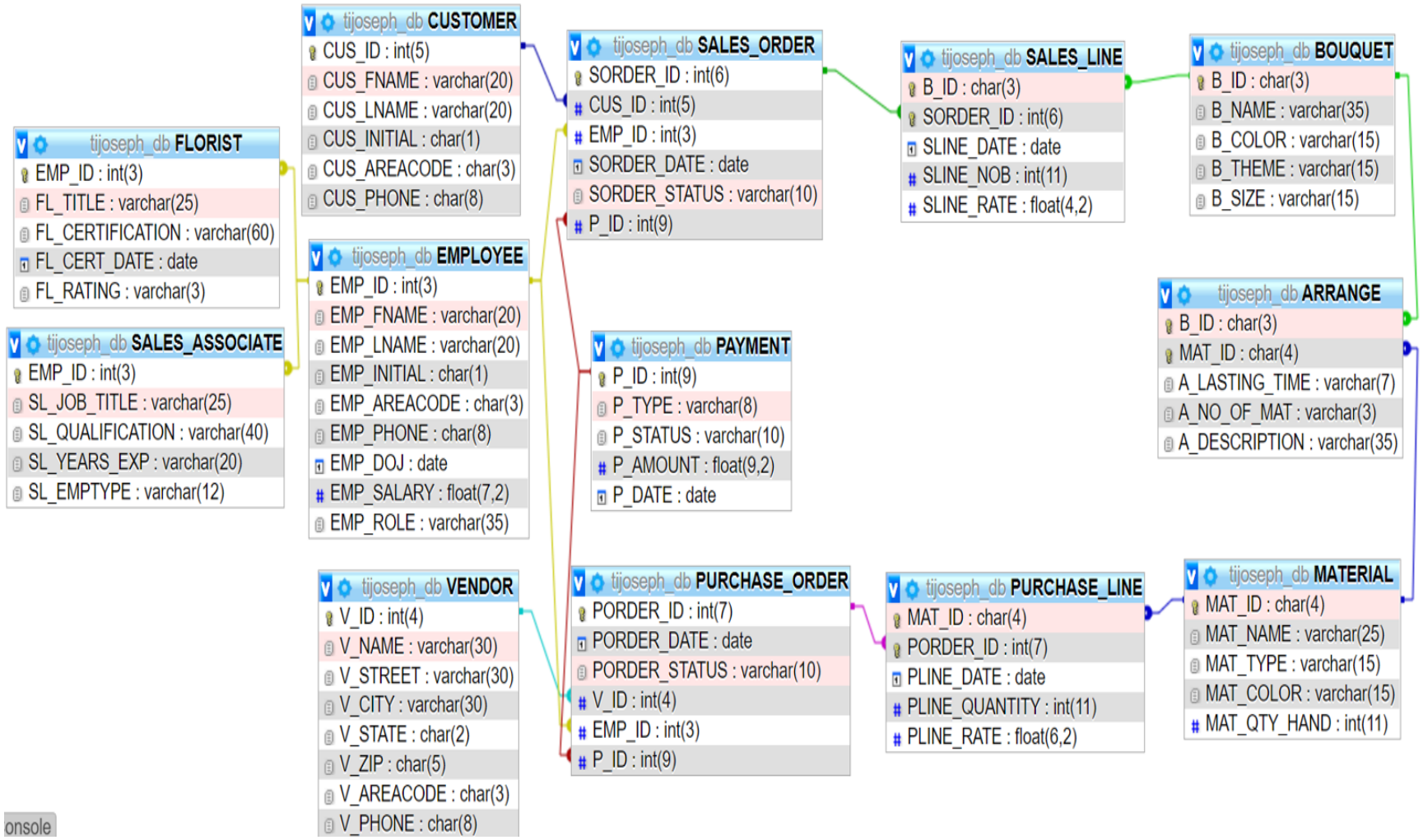
EMPLOYEE (**EMP_ID**-> EMP_FNAME, EMP_LNAME, EMP_STREET, LOC_ZIP)

ORDER (**CUS_ID, EMP_ID**, ORDER_DATE, ORDER_STATUS)

LOCATION (**LOC_ZIP**, LOC_CITY, LOC_STATE)

PART 3: THE DATABASE

2.BUILD THE RELATIONSIPS:



3.WORKING SQL QUERIES:

Question 1:

the list of vendors who are based on ‘CALIFORNIA (CA)’.

Query 1:

```
SELECT V_NAME, V_STREET, V_CITY, V_STATE FROM VENDOR WHERE V_STATE='CA';
```

Options

	V_NAME	V_STREET	V_CITY	V_STATE
Edit Copy Delete	Lilacs, Inc.	Blake St	San Francisco	CA
Edit Copy Delete	Billy Dist.	34th St	San Diego	CA

Check all *With selected:* Edit Copy Delete Export

Question 2:

How many bouquets were purchased by the customer ‘James Lawrence’?

Query 2:

```
SELECT CUSTOMER.CUS_ID, CUSTOMER.CUS_FNAME,

CUSTOMER.CUS_LNAME, COUNT(BOUQUET.B_ID)

FROM CUSTOMER

JOIN SALES_ORDER ON CUSTOMER.CUS_ID = SALES_ORDER.CUS_ID

JOIN SALES_LINE ON SALES_ORDER.SORDER_ID =SALES_LINE.SORDER_ID

JOIN BOUQUET ON SALES_LINE.B_ID = BOUQUET.B_ID

WHERE CUSTOMER.CUS_FNAME='James' AND

CUSTOMER.CUS_LNAME='Lawrence';
```

+ Options

CUS_ID	CUS_FNAME	CUS_LNAME	COUNT(BOUQUET.B_ID)
10003	James	Lawrence	2

Question 3:

Select the list of Employees who have the same salary.

Query 3:

```
SELECT EMP_ID, EMP_FNAME, EMP_LNAME, EMP_SALARY FROM EMPLOYEE

WHERE EMP_SALARY IN

( SELECT EMP_SALARY FROM EMPLOYEE

  GROUP BY EMP_SALARY HAVING COUNT(*) > 1);
```

+ Options

	EMP_ID	EMP_FNAME	EMP_LNAME	EMP_SALARY
Edit Copy Delete	103	Rob	Jones	3500.00
Edit Copy Delete	105	Rina	Williams	3500.00
Edit Copy Delete	107	Shawn	Jose	3500.00
Edit Copy Delete	108	Joe	Paul	3700.00
Edit Copy Delete	115	Sandra	Rhode	3700.00