

Project Summary:

At the beginning of the semester, we decided to design a database for a small B2C website, and we designed a special theme for this website - to help fruit farmers who are in trouble because of the epidemic, we only established 4 tables - Customers, Orders, Order_Details and Products- for the database to make our project simple but sufficient.

The first draft peer reviews pointed out that we did not maintain the consistency of Table names in the first draft of the project, and the description of each entity was not sufficient, so we re-checked the naming and description of the entities outlines section, and revised the inconsistent Named and refined the descriptions of the various entities and relationships.

Our instructor Chris pointed out some problems: cus_address and customer_name should be broken into smaller pieces, varchar is not a good datatype for shipping_status and it is not reasonable to use a dedicated id as the primary key of a connection table. Therefore, we divide addresses into five attributes of add_line1, line2, city, state, and zipcode, and divide customer_name into three parts: first_name, last_name and mid_name. Then we use a predefined ENUM to replace varchar as the datatype for storing shipping_status. Finally, we removed the order_details_id and changed the product_id & order_id contained in the Order_Details table to FK/PK so that this table has the function of the connection table.

In step 2, when we tried to use phpmyadmin to add constraints to product_id and order_id in the Order_Details table, we encountered a problem that we could not solve at the time - phpMyAdmin seemed to be unable to set both ids as PK/FK. In order to avoid errors, we removed the FK constraint of the two ids and then consulted Chris and learned that it was a phpMyAdmin problem, so we re-added the PK/FK constraints.

For our DDL, Chris gave some suggestions based on our outline draft. The first is that there are several attributes like price and total price in many of our databases. There may be design contradictions between them, and may also cause wrong datas. So we removed some attributes and use UPDATE clause to get some columns to be automatically calculated. The second was that outlines didn't really fit the DDL so we added some constraints to make DDL fit the outline and also updated outlines. Additionally, Chris told us there's a problem inserting ENUM in MariaDB so we tried to use STRICT SQL mode to avoid empty strings being inserted into ENUMs.

In step3, based on the project guide, we made the html code including the index page and the pages corresponding to the four tables. At the same time, we also received comments on the revision of the html code from peer reviews, but after a discussion between us and Chris, we decided to abandon html and use handlebars, nodejs and JavaScript to build the website, and this is what Nickson mainly does in step 4.

Project 1:

Local Fruit Growers Assistance Programme

Team #1

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Project overview:

This is a rural E-commerce program aiming to help local farmers who are struggling with finding a way to sell their products, especially for apple growers and orange growers. The program operates a B2C website with cooperative express facility and some warehouses founded locally. Now

approximately 5000 tons of oranges are ripe, but due to hardship caused by the pandemic, no fruit company wants to come to this rural area and buy the oranges, however the oranges will be packaged locally and shipped nationwide to customers' homes with the help of our program. A database driven website will record *Orders of Products to Customers*. This database system will help the business to be more efficient in tracking all the sales and inventory. Having a database management could help in making decisions about when to harvest more by getting notifications if an item has low stocks.



Database Outline

❖ Customers

- Description: This table stores all of the account information for users to shop at this website
- Relationship: There's an M:M relationship between Customers and Products, but in actual implementation of the database we just connect Customers to Orders, and there's an 1:M relationship between them.
- Attributes
 - **customer_id**: auto_increment, unique, not NULL, *int(11)*, PK
 - **first_name**: not NULL, *varchar(20)*
 - **last_name**: not NULL, *varchar(20)*

- **phone:** *int(11)* //not_both_null constraints added for phone and email.
- **email:** *varchar(50)* // Either phone OR email is required but not both so they could be NULL
- **cusadd_line1:** not NULL, *varchar(255)*
- **cusadd_city:** not NULL, *varchar(20)*
- **cusadd_state:** not NULL, *varchar(20)*
- **cusadd_zipcode:** not NULL, *int(5)*

❖ Orders

- Description: This table stores the major stats of orders after the users purchase fruits from the website.
- Relationship: There's an M:1 relationship between Orders and Customers, and an 1:M relationship between Orders and Order_Details.
- Attributes
 - **order_id:** auto_increment, unique, not NULL, *int(11)*, PK
 - **order_date:** *datetime* // We will use some mysql function to get the current datetime automatically, so it could be NULL but will automatically not NULL.
 - **order_total:** not NULL, *decimal(12,2)*
 - **customer_id:** auto_increment, unique, not NULL, *int(11)*, FK
 - **shipping_status:** not NULL, *enum('not shipped', 'shipped', 'delivered', 'returned')*

❖ Order_Details

- Description: This table connects Orders to Products and 1 Order_Details table will only store the stats of 1 product information in one Customer's Orders.
- Relationship: There's an M:1 relationship between Order_Details and Orders, and an M:1 relationship between Order_Details and Products
- Attributes
 - **product_id:** auto_increment, unique, not NULL, *int(11)*, PK, FK
 - **order_id:** auto_increment, unique, not NULL, *int(11)*, PK, FK
 - **product_qty:** not NULL, *int(11)*
 - **sub_total:** not NULL, *decimal(12,2)*

❖ Products

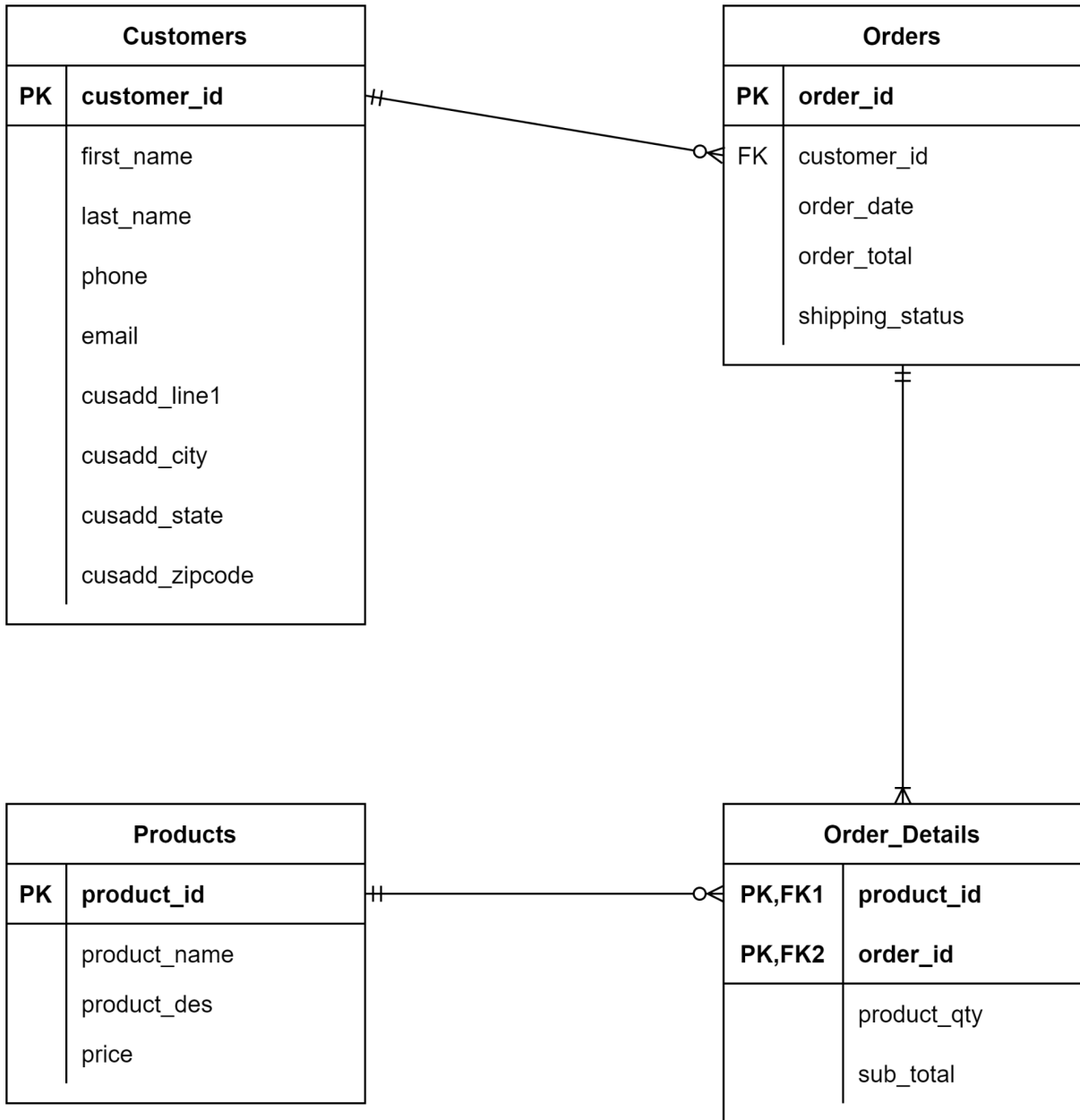
- Description: Store the information of fruits that we need to sell for farmers in trouble
- Relationship: There's an 1:M relationship between Products and Order_Details.
- Attributes
 - **product_id:** auto_increment, unique, not NULL, *int(11)*, PK

// When selling only oranges, there are three different sizes of packages(10lbs, 20lbs, 40lbs) listed as three different products.

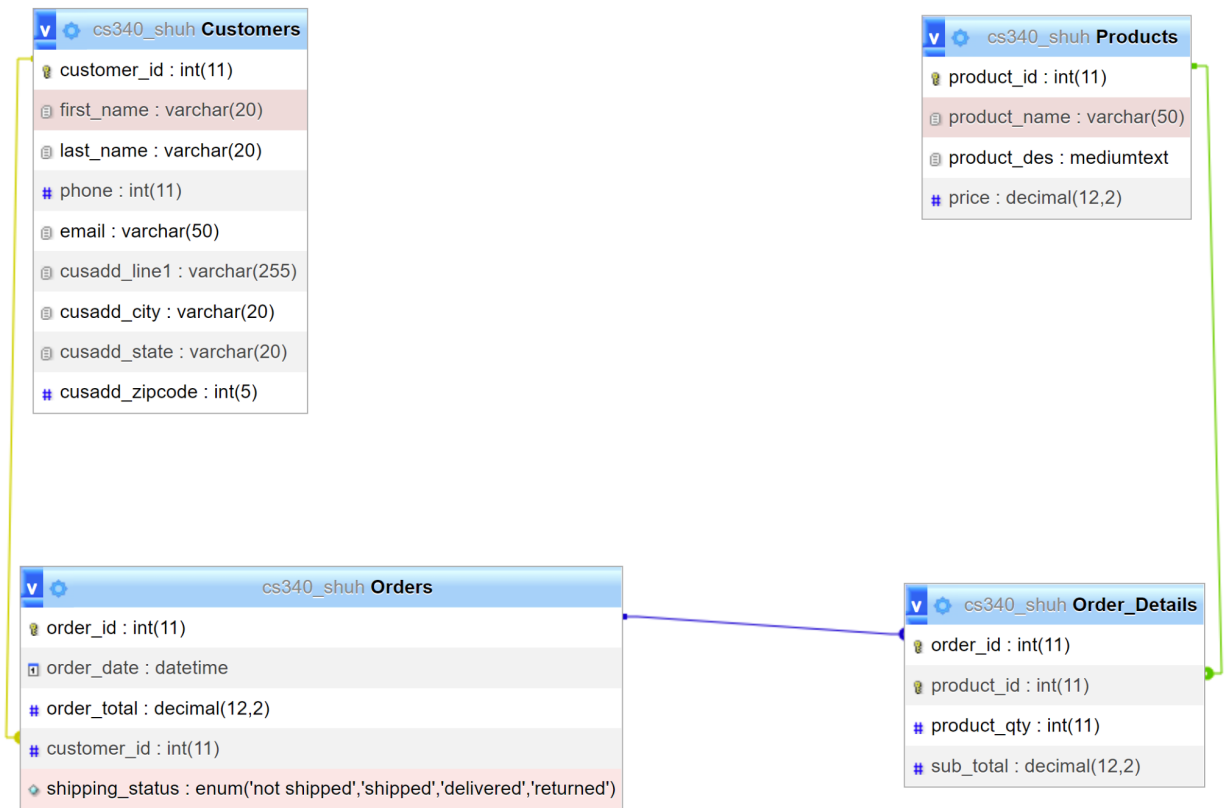
 - **product_name:** not NULL, *varchar(50)*

- **product_des**: *varchar(max)*
- **price**: not NULL, *decimal(12,2)*

Entity Relation Diagram



Schema Diagram



Sample datas

Customers			
customer_id	1	2	3
first_name	Barrett	White	Hongyibo
mid_name	/	/	/
last_name	Mila	Smith	Shu
cusadd_line1	60025 Bollinger Canyon	482505 Warm	701 7th Street

	Road	Springs Blvd.	
cusadd_line2	/	/	/
cusadd_city	San Ramon	Fremont	Corvallis
cusadd_state	California	California	Oregon
cusadd_zipcode	94583	94536	97333
phone	1234567890	/	/
email	/	WhiteSmithCS340@ hotmail.com	shuh@oregonstate.ed u

Orders			
order_id	1	2	3
customer_id	1	2	3
order_date	2022-07-02 16:44:23	2022-07-10 09:45:03	2022-07-12 17:55:30
order_total	17.85	11.90	5.95
shipping_status	Delivered	Shipped	Not shipped
shipadd_line1	60025 Bollinger Canyon Road	482505 Warm Springs Blvd.	701 7th Street
shipadd_line2	/	/	/
shipadd_city	San Ramon	Fremont	Corvallis
shipadd_state	California	California	Oregon
shipadd_zipcode	94583	94536	97333

Order_Details			
order_id	1	2	3
product_id	1	1	1
product_price	5.95	5.95	5.95

discount	0	0	0
product_qty	1	2	3
sub_total	17.85	11.90	5.95

Products		
product_id	1	2
product_name	Oranges 5lbs pack	Oranges 10lbs pack
product_des	Fresh Orange from a rural farm	Fresh Orange from a rural farm
price	5.95	11.50
stock	3000	1000