A Retail Database Management System

GROUP 14

2022 Fall Term Database Management Systems CIS 3400 EMWA [28994]

Members:

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Business Scenario

Our client has been struggling with keeping track of their inventory for years now. Now that technology is more diverse and they are exploring their opinions, Clothing Store ABC wants to implement our database project to help their store. This will help them with the following...

2. Description of Group 14 Project

Group 14 is creating a database that will be used by a clothing store that will have virtual clothing storage to keep track of their inventory, sales, and can set alerts to replenish items and indicate which items to move to clearance. Often clothing stores have so much inventory but no proper tracking system to indicate what is available or out of stock. Our database will be particularly beneficial for small businesses, as larger corporations have extensive resources to create databases which can be very costly.

3. Problem-Solving

Brands will benefit from this application and database because it would help to lessen the tediousness of inventory management. It can be very time consuming and inaccurate so we hope automating parts of this process will save our clients time and energy. By using a process which is automated this will create a better management and shopping experience all around.

Customers will also be able to shop for the occasion by accessing the store's current and future inventory. This application will help customers save time and frustration because they are unable to find their correct sizes or specific items and have no way of knowing if there are any left in stock, without first having to ask an employee who could be busy or unable to check immediately. The information they seek will be readily available in store as they shop, by using scanners placed around the store that will provide them with information about any item they scan.

Often times, clothing stores have so much inventory but not a proper system to track what is available and what is not. Additionally, many times employees must keep count of what is available and sold out in order to know what and when to reorder. This will be particularly beneficial for small businesses, as larger corporations have extensive and expensive resources already. From the perspective of the customer, like many can relate to, we go into a store needing an outfit for a specific occasion and cannot find what to wear. We only know the inventory available based on what we see or what the employee remembers. Therefore, with the help of this new database, customers can find exact outfits, find clothing without rummaging throughout the store and wasting time, and overall have a more positive shopping experience.

4. Initial Entities

Store:

- StoreName
- StoreLocation
- Specialty
- Price
- ClothingType
- ClothingSize
- SizeStock

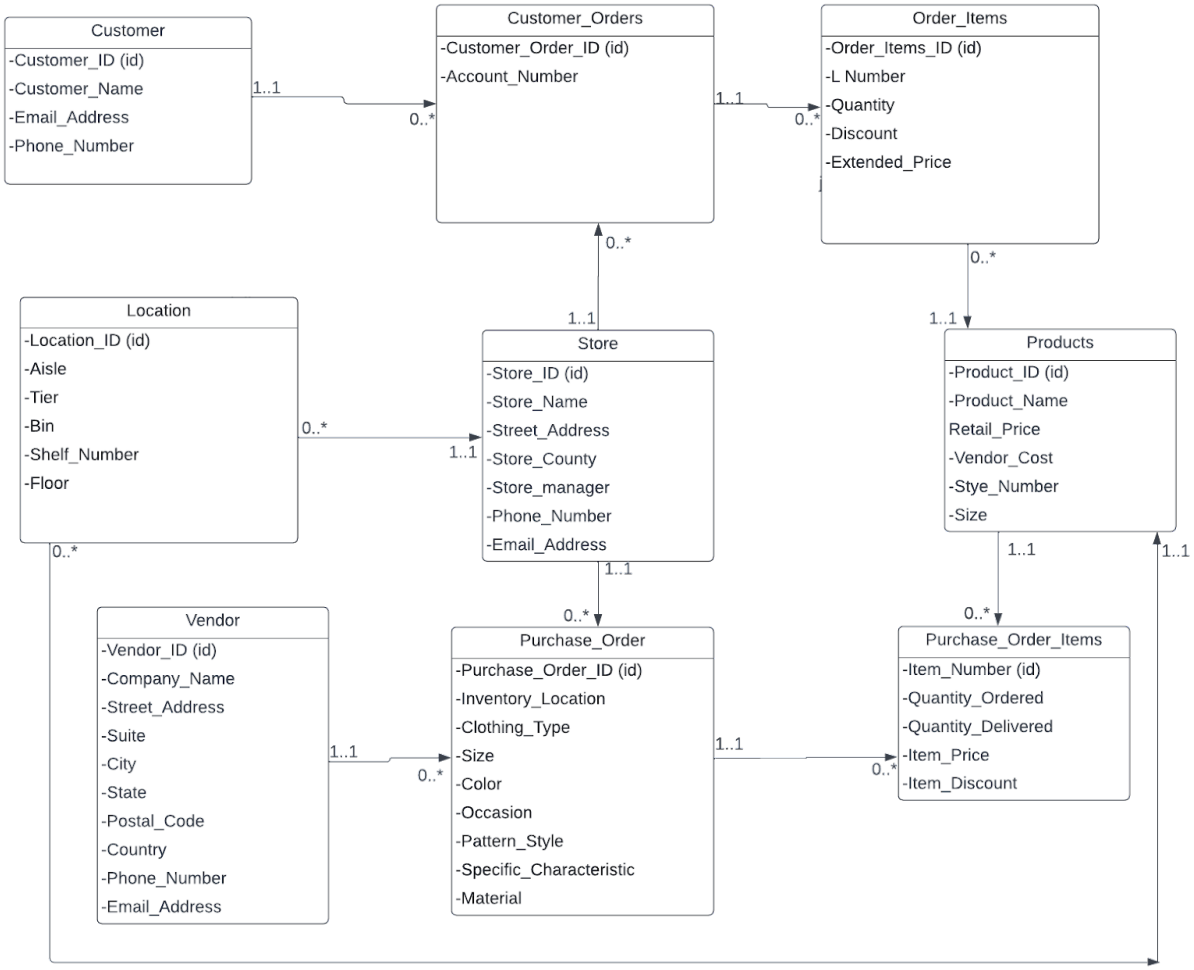
Customer:

- Name
- CustomerOccasion
- CustomerSize
- Location
- Budget
- MethodOfPayment
- EmailAddress

5. Distribution of duties for the project

- Adelaide Ilyasov: Documentation Writer
- Gyalbu Sherpa: Researcher
- Kario Champagnie: System Analyst
- Khojiakbar Yusupov: Application Developer
- Mohammad-Farid Osmani: Application Developer

Entity Relationship Model Diagram:



Relationship Sentences:

· One Customer may be (0) putting in one or more (*) customer orders

· One Customer order must be (1) placed by only one (1) customer

· One Customer order may be (0) filled by one or more(*) order items

· One Order item must be(1) placed in only one (1) customer order

· One Customer order may be (0) filled by one or more(*) order items

· One Order item must be(1) placed in only one (1) customer order

· One Customer order may be (0) filled by one or more(*) order items

· One Order item must be(1) placed in only one (1) customer order

· One Customer order may be (0) filled by one or more(*) order items

· One Order item must be(1) placed in only one (1) customer order

· One Customer order may be (0) filled by one or more(*) order items

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· One Customer order may be (0) filled by one or more(*) order items

· One Order item must be(1) placed in only one (1) customer order

· One Customer order may be (0) filled by one or more(*) order items

· One Order item must be(1) placed in only one (1) customer order

· One Customer order may be (0) filled by one or more(*) order items

· One Order item must be(1) placed in only one (1) customer order

Normalization:

1. Figure out the Primary Keys in Group 14 relation
2. Find what the dependencies are
3. Normalization

Store (Store_ID (Key), Store_Name, Street_Address, Store_County, Store_Manager, Phone_Number, Email_Address)

- Key: Store
- Non-Key: Store_Name, Street_Address, Store_County, Store_Manager, Phone_Number, Email_Address
- FD1: Store → Store_Name, Street_Address, Store_County, Store_Manager, Phone_Number, - Email_Address

Products(Productid(KEY), Product_Name, Rental_Price, Vendor_Cost, Style_Number, Size)

- Key: Product
- Non-Key: Product_Name, Rental_Price, Vendor_Cost, Style_Number, Size
- FD1: Product → Product_Name, Rental_Price, Vendor_Cost, Style_Number, Size

Location (Location_ID(key), Aisle, Tier, Bin, Shelf_ Number, Floor, StoreId(fk), ProductID (FK))

- Key: Location, Store, Product
- Non-Key: Aisle, Tier, Bin, Shelf_ Number, Floor
- FD1: Location, Store, Product → Aisle, Tier, Bin, Shelf_ Number, Floor

Customer(Customer_ID(key), Customer_Name, Email_Address, Phone_Number)

- Key: Customer
- Non-Key: Customer_Name, Email_Address, Phone_Number
- FD1: Customer → Customer_Name, Email_Address, Phone_Number

Customer_Order(Customer_order_ID(key), Account_Number, Customer_ID(fk), Store_ID (FK))

- Key: Customer_Order
- Non-Key: Account_Number, Customer, Store
- FD1: Customer_Order → Account_Number, Customer, Store

Order_items (Order_item_ID(KEY), Line_Number, Quantity_Discount, Extended_ Price, Customer_Order_ID(fk), Product_ID(fk))

- Key: Order_Item
- Non-Key: Line_Number, Quantity_Discount, Extended_ Price, Customer_Order, Product
- FD1: Order_Item → Line_Number, Quantity_Discount, Extended_ Price, Customer_Order, Product

PurchaseOrder (Purchase_order_id (Key), Inventory_Location, Clothing_Type, Size, Color, Occasion, Pattern_Style, Specific_Charesteristic, Material)

- Key: Purchase_Order
- Non-Key: Inventory_Location, Clothing_Type, Size, Color, Occasion, Pattern_Style, Specific_Charesteristic, Material
- FD1: Purchase_Order → Inventory_Location, Clothing_Type, Size, Color, Occasion, Pattern_Style, Specific_Charesteristic, Material

Purchase_order_Item (Item_Number(key), Quantity_Ordered, Quantity_Delivered, Item_Price, Item_Discount, Purchase_Order_ID(FK)(Key), Product_ID (FK))

- Key: Item_Number, Purchase_Order
- Non-Key: Quantity_Ordered, Quantity_Delivered, Item_Price, Item_Discount, Product
- FD1: Item_Number, Purchase_Order → Quantity_Ordered, Quantity_Delivered, Item_Price, Item_Discount, Product_ID

All functional dependencies are in 3NF Thus the final set of relations are:

- Store (Store_ID, Store_Name, Street_Address, Store_County, Store_Manager, Phone_Number, Email_Address) Key: Store
- Products(Product, Product_Name, Rental_Price, Vendor_Cost, Style_Number, Size)

  Key: Product
- Location (Location, Aisle, Tier, Bin, Shelf_ Number, Floor, Store, Product) Key: Location, Store, Product
- Customer(Customer, Customer_Name, Email_Address, Phone_Number) Key: Customer
- Order_items (Order_Item, Line_Number, Quantity_Discount, Extended_ Price, Customer_Order, Product) Key: Order_Item
- PurchaseOrder (Purchase_Order, Inventory_Location, Clothing_Type, Size, Color, Occasion, Pattern_Style, Specific_Charesteristic, Material) Key: Purchase_Order

- Purchase_order_Item (Item_Number, Quantity_Ordered, Quantity_Delivered, Item_Price, Item_Discount, Purchase_Order_ID, Product_ID) Key: Item_Number, Purchase_Order

SQL Code:

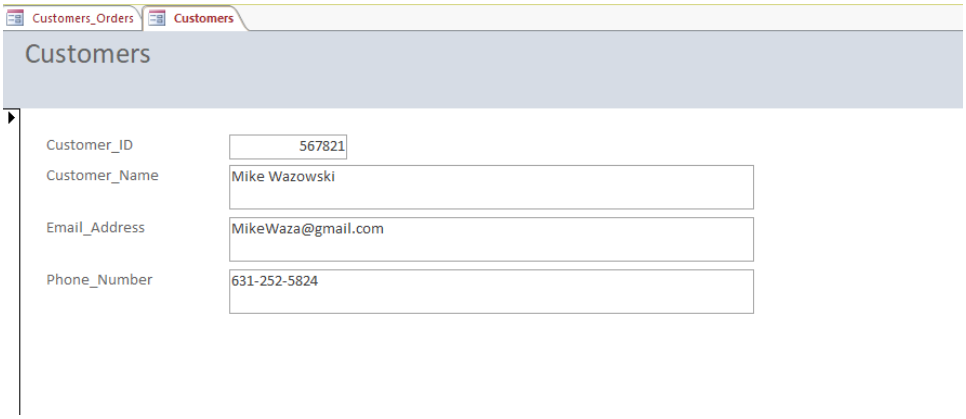
```
CREATE TABLE Customers (
    Customer_ID        INTEGER          NOT NULL PRIMARY KEY,
    Customer_Name      VARCHAR (30)      NOT NULL,
    Email_Address      VARCHAR (35),
    Phone_Number       VARCHAR (14),
) ;

CREATE TABLE Customer_Orders (
   Customer_OrderID      INTEGER          NOT NULL PRIMARY KEY,
   Account_Number        INTEGER          NOT NULL,
);

CREATE TABLE Order_Items(
Order_Items ID              INTEGER       NOT NULL PRIMARY KEY,
L.Number                    INTEGER,
Quantity                    INTEGER,
Discount                    INTEGER,
Extended_Price              INTEGER,
);



CREATE TABLE Store (
   Store_ID        INTEGER     NOT NULL PRIMARY KEY,
   Store_Name      VARCHAR(30) NOT NULL,
   Street_Address  VARCHAR(35) NOT NULL,
   Store_County    VARCHAR(35),
   Store_Manager   VARCHAR(35),
   Phone_Number    VARCHAR(14),
   Email_Address   VARCHAR(35)
) ;
```

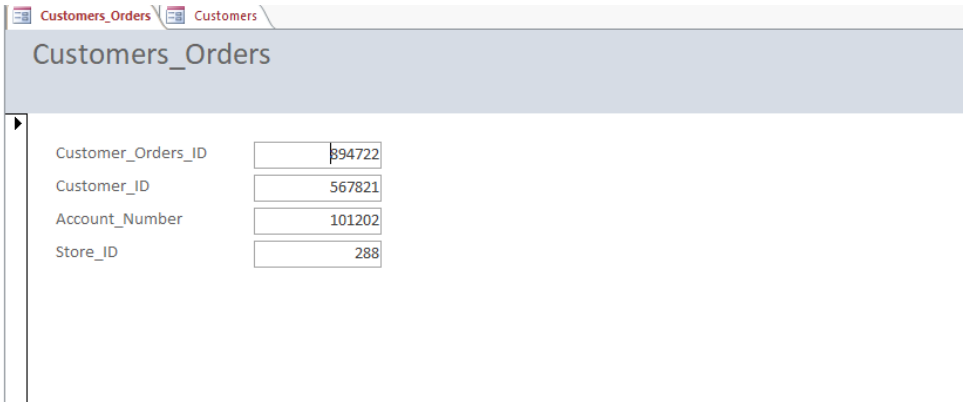
```
CREATE TABLE Products (
    Product_ID     INTEGER     NOT NULL PRIMARY KEY,
    Product_Name   VARCHAR(35) NOT NULL,
    Rental_Price   NUMBER,
    Vendor_Cost    NUMBER,
    Style_Number   VARCHAR(12),
    Size           VARCHAR(10)
);

CREATE TABLE Location (
   Location_ID     INTEGER     NOT NULL PRIMARY KEY,
   Aisle           INTEGER     NOT NULL,
   Tier            INTEGER     NOT NULL,
   Bin             INTEGER,
   Shelf_Number    INTEGER,
   Floor           INTEGER,
   Store_ID        INTEGER,
   Product_ID      INTEGER
);

ALTER TABLE Location ADD CONSTRAINT fk_Location_Store FOREIGN
KEY (store_id) REFERENCES Store (Store_ID);
ALTER TABLE Location ADD CONSTRAINT fk_Location_Product  FOREIGN
KEY (product_id) REFERENCES Products (product_id);



CREATE TABLE VENDOR (
   Vendor_ID        INTEGER     NOT NULL PRIMARY KEY,
   Company_Name     VARCHAR(30) NOT NULL,
   Street_Address   VARCHAR(35) NOT NULL,
   State            VARCHAR(35),
   City             VARCHAR(35),
   Postal_Code      INTEGER,
```

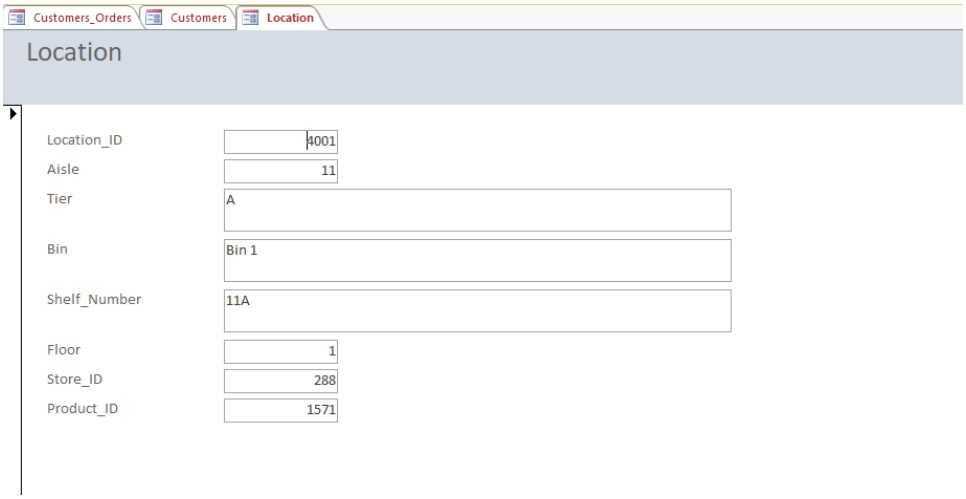
```
   Country           VARCHAR(20),
   Phone_Number     VARCHAR(14),
   Email_Address    VARCHAR(35)
) ;



CREATE TABLE Purchase_Order (
   Purchase_OrderID           INTEGER     NOT NULL PRIMARY KEY,
   Inventory_location         VARCHAR(30) NOT NULL,
   Clothing_Type              VARCHAR(35) NOT NULL,
   Size                       INTEGER,
   Color                      VARCHAR(35),
   Postal_Code                INTEGER,
   Occasion                   VARCHAR(20),
   Pattern_Style              VARCHAR(14),
   Specific_characteristic    VARCHAR(35),
   Material                   VARCHAR(35),
) ;

CREATE TABLE purchase_order_Items
  Item_Number                INTEGER      NOT NULL PRIMARY KEY,
  Quantity_Ordered           INTEGER,
  Quantity_Delivered         INTEGER,
  Item_price                 INTEGER,
  Item_Discount              INTEGER,
);

ALTER TABLE Customer_Orders ADD CONSTRAINT fk_customer_ord
FOREIGN KEY (customer_ID) REFERENCES Customers(Customer_ID);
ALTER TABLE Customer_Orders ADD CONSTRAINT fk_customer_store
FOREIGN KEY (store_ID) REFERENCES Store(Store_ID);
ALTER TABLE order_items ADD CONSTRAINT fk_customer_orderId
FOREIGN KEY(Customer_OrderID) REFERENCES
Customer_Orders(Customer_OrderID);
ALTER TABLE order_items ADD CONSTRAINT fk_product_Id FOREIGN
KEY(Product_ID)   REFERENCES Products(Product_ID);
```

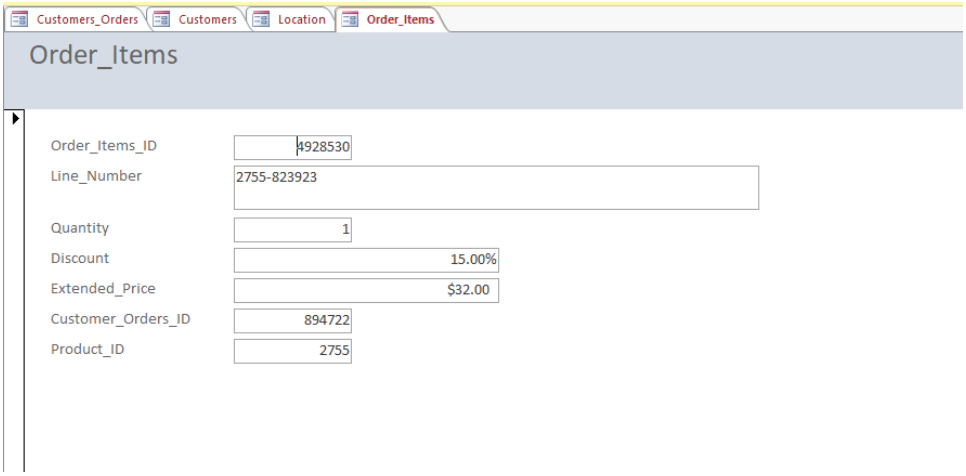
```
ALTER TABLE Location ADD CONSTRAINT fk_Location_Store FOREIGN
KEY (store_id) REFERENCES Store (Store_ID);

ALTER TABLE Location ADD CONSTRAINT fk_Location_Product  FOREIGN
KEY (product_id) REFERENCES Products (product_id);

ALTER TABLE purchase_order_items ADD CONSTRAINT
fk_purchase_orderId FOREIGN KEY (purchase_orderId) REFERENCES
Purchase_Order(Purchase_OrderID);

ALTER TABLE purchse_order_items ADD CONSTRAINT fk_product_ID
FOREIGN KEY (product_id) REFERENCES Products (product_id);
```

Forms, Reports, and Queries: more data in zip








Customers_Orders
Customers
Location
Order_Items
Order_Items
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4928530
Line_Number
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Quantity
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Extended_Price
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Customer_Orders_ID
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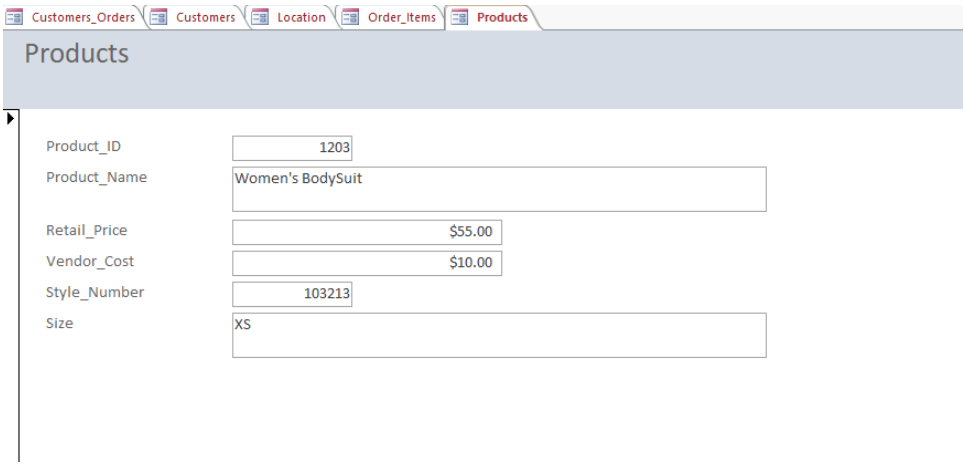
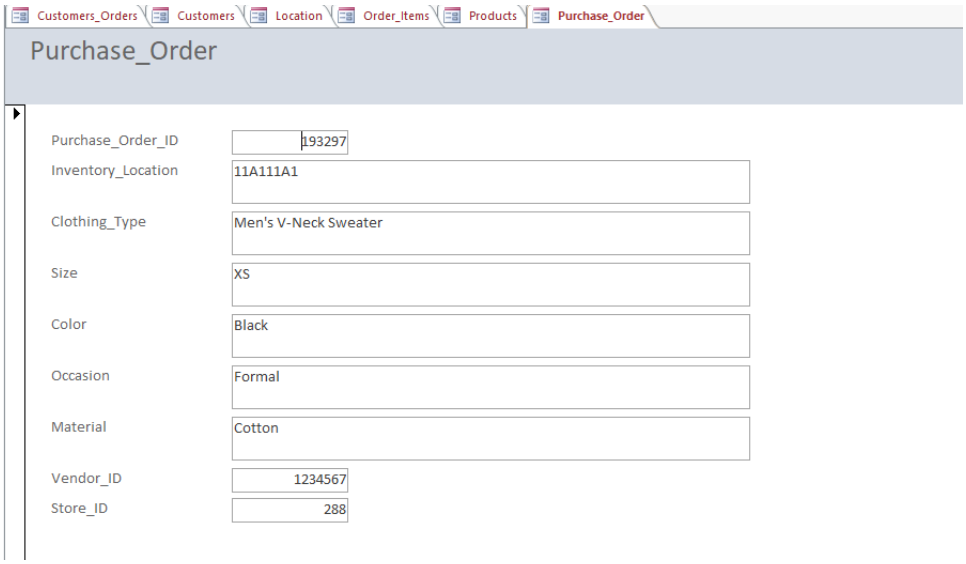
Product_ID
2755


Customers_Orders
Customers
Location
Order_Items
Products
Products
Product_ID
1203
Product_Name
Women's BodySuit
Retail_Price
$55.00
Vendor_Cost
$10.00
Style_Number
103213
Size
XS


Customers_Orders
Customers
Location
Order_Items
Products
Purchase_Order
Purchase_Order
Purchase_Order_ID
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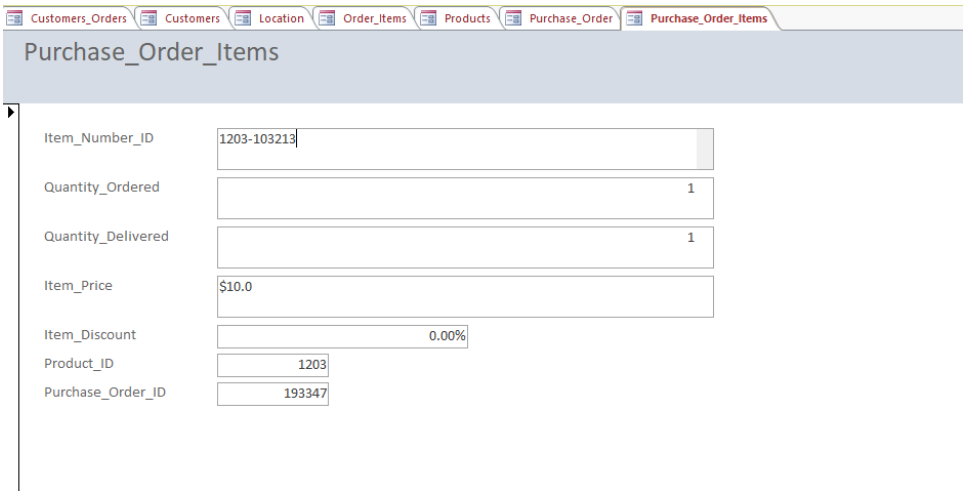
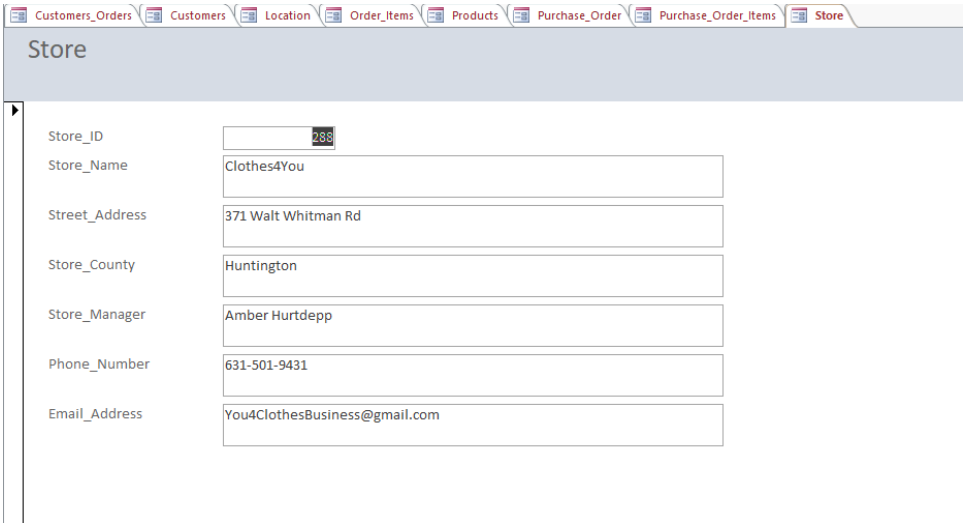
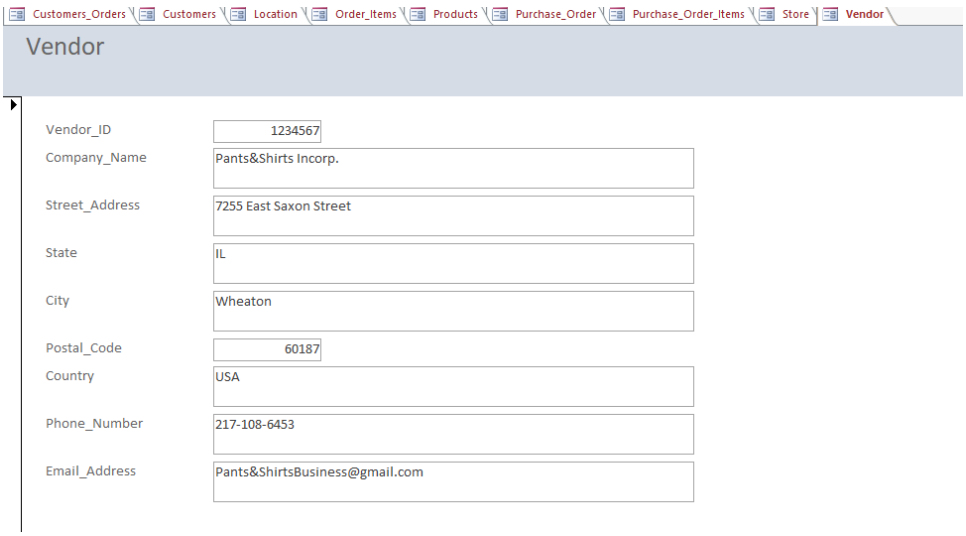
Inventory_Location
11A111A1
Clothing_Type
Men's V-Neck Sweater
Size
XS
Color
Black
Occasion
Formal
Material
Cotton
Vendor_ID
1234567
Store_ID
288


Customers_Orders
Customers
Location
Order_Items
Products
Purchase_Order
Purchase_Order_Items
Purchase_Order_Items
Item_Number_ID
1203-103213
Quantity_Ordered
1
Quantity_Delivered
1
Item_Price
$10.0
Item_Discount
0.00%
Product_ID
1203
Purchase_Order_ID
193347


Customers_Orders
Customers
Location
Order_Items
Products
Purchase_Order
Purchase_Order_Items
Store
Store
Store_ID
288
Store_Name
Clothes4You
Street_Address
371 Walt Whitman Rd
Store_County
Huntington
Store_Manager
Amber Hurtdepp
Phone_Number
631-501-9431
Email_Address
You4ClothesBusiness@gmail.com


Customers_Orders
Customers
Location
Order_Items
Products
Purchase_Order
Purchase_Order_Items
Store
Vendor
Vendor
Vendor_ID
1234567
Company_Name
Pants&Shirts Incorp.
Street_Address
7255 East Saxon Street
State
IL
City
Wheaton
Postal_Code
60187
Country
USA
Phone_Number
217-108-6453
Email_Address
Pants&ShirtsBusiness@gmail.com

Customers

Customer_ID	567821
Customer_Name	Mike Wazowski
Email_Address	MikeWaza@gmail.com
Phone_Number	631-252-5824
Customer_ID	567822
Customer_Name	Louis Armweak
Email_Address	LouisWeak@yahoo.com
Phone_Number	631-252-5825
Customer_ID	567823
Customer_Name	Vanessa Hudgens
Email_Address	VanesHudge@aol.com
Phone_Number	631-252-5826
Customer_ID	567824
Customer_Name	Coby Brian
Email_Address	galagachamp@outlook.com
Phone_Number	631-252-5827
Customer_ID	567825
Customer_Name	Brandon Bent
Email_Address	BentBrand@gmail.com
Phone_Number	631-252-5828
Customer_ID	567826

Customers_Orders

Customer_ID	Customer_Orders_ID	Account_Number	Store_ID
567821	894722	101202	288
567822	894723	101203	288
567823	894724	101204	288
567824	894725	101205	288
567825	894726	101206	288
567826	894727	101207	288
567827	894728	101208	288
567828	894729	101209	288
567829	894730	101210	288
567830	894731	101211	288
567831	894732	101212	288
567832	894733	101213	288
567833	894734	101214	288

Location

Store_ID	on_ID	ct_ID	Aisle	Tier	Bin	Shelf_Number	ır
288							
	4001	1571	11	A	Bin 1	11A	#
	4002	1572	12	A	Bin 2	12A	#
	4003	1573	13	A	Bin 3	13A	#
	4004	1574	14	A	Bin 4	14A	#
	4005	1575	15	A	Bin 5	15A	#
	4006	2753	16	A	Bin 6	16A	#
	4007	2754	17	A	Bin 7	17A	#
	4008	2755	18	A	Bin 8	18A	#
	4009	2756	19	A	Bin 9	19A	#
	4010	2757	20	A	Bin 10	20A	#
	4011	1963	21	B	Bin 11	21B	#
	4012	1964	22	B	Bin 12	22B	#
	4013	1965	23	B	Bin 13	23B	#
	4014	1966	24	B	Bin 14	24B	#
	4015	1967	25	B	Bin 15	25B	#
	4016	3742	26	B	Bin 16	26B	#
	4017	3743	27	B	Bin 17	27B	#
	4018	3744	28	B	Bin 18	28B	#
	4019	3745	29	B	Bin 19	29B	#
	4020	3746	30	B	Bin 20	30B	#
	4021	4525	31	C	Bin 21	31C	#
	4022	4526	32	C	Bin 22	32C	#
	4023	4527	33	C	Bin 23	33C	#
	4024	4528	34	C	Bin 24	34C	#
	4025	4529	35	C	Bin 25	35C	#

Order_Items

Customer_Orders	Product_ID	Order_Items_ID	Line_Number	Quantity	Discount	nded_Price
894722						
	2755					
		4928530	2755-823923	1	15.00%	$32.00
894723						
	6914					
		4928531	6914-134924	1	25.00%	$10.00
894724						
	1965					
		4928532	1965-127734	1	25.00%	$186.00
894725						
	3744					
		4928533	3744-308184	1	25.00%	$93.00
894726						
	8194					
		4928534	8194-552036	4	25.00%	$15.00
894727						
	2012					
		4928535	2012-431468	1	50.00%	$7.50
894728						
	7139					
		4928536	7139-500012	1	10.00%	$61.20
894729						
	7140					
		4928537	7140-500013	1	10.00%	$61.20
894730						
	7141					

Products

Product_ID	Product_Name	Retail_Price	Vendor_Cost	Style_Number	Size
1203	Women's BodySuit	$55.00	$10.00	103213	XS
1204	Women's BodySuit	$55.00	$10.00	103214	S
1205	Women's BodySuit	$55.00	$10.00	103215	M
1206	Women's BodySuit	$55.00	$10.00	103216	L
1207	Women's BodySuit	$55.00	$10.00	103217	XL
1571	Men's V-Neck Sweater	$44.00	$10.00	712032	XS
1572	Men's V-Neck Sweater	$44.00	$10.00	712033	S
1573	Men's V-Neck Sweater	$44.00	$10.00	712034	M
1574	Men's V-Neck Sweater	$44.00	$10.00	712035	L
1575	Men's V-Neck Sweater	$44.00	$10.00	712036	XL
1963	Men's Suit Jacket	$248.00	$50.00	127732	XS
1964	Men's Suit Jacket	$248.00	$50.00	127733	S
1965	Men's Suit Jacket	$248.00	$50.00	127734	M

Purchase_Order

Vendor_ID	P_O_ID	Inventory_Locatic	Store_ID	Clothing_Type	Size	Material	Color
1234567							
	193298	12A212A1	288	Men's V-Neck Sweater	S	Cotton	Black
	193299	13A313A1	288	Men's V-Neck Sweater	M	Cotton	Black
	193300	14A414A1	288	Men's V-Neck Sweater	L	Cotton	Black
	193301	15A515A1	288	Men's V-Neck Sweater	XL	Cotton	Black
	193302	16A616A2	288	Women's Sweater Vest	XS	Wool	Beige
	193303	17A717A2	288	Women's Sweater Vest	S	Wool	Beige
	193304	18A818A2	288	Women's Sweater Vest	M	Wool	Beige
	193305	19A919A2	288	Women's Sweater Vest	L	Wool	Beige
	193306	20A1020A2	288	Women's Sweater Vest	XL	Wool	Beige
	193297	11A111A1	288	Men's V-Neck Sweater	XS	Cotton	Black
1234568							
	193308	22B1222B3	288	Men's Suit Jacket	S	Cotton	Navy Blue
	193316	30B2030B4	288	Men's Suit Pants	XL	Cotton	Navy Blue
	193315	29B1929B4	288	Men's Suit Pants	L	Cotton	Navy Blue
	193314	28B1828B4	288	Men's Suit Pants	M	Cotton	Navy Blue
	193313	27B1727B4	288	Men's Suit Pants	S	Cotton	Navy Blue
	193312	26B1626B4	288	Men's Suit Pants	XS	Cotton	Navy Blue
	193311	25B1525B3	288	Men's Suit Jacket	XL	Cotton	Navy Blue
	193309	23B1323B3	288	Men's Suit Jacket	M	Cotton	Navy Blue
	193307	21B1121B3	288	Men's Suit Jacket	XS	Cotton	Navy Blue
	193310	24B1424B3	288	Men's Suit Jacket	L	Cotton	Navy Blue
1234569							
	193323	37C2737C5	288	Women's T-Shirt	S	Cotton	White
	193318	32C2232C4	288	Women's Dress	S	Sequin	Ruby Red
	193326	40C3040C5	288	Women's T-Shirt	XL	Cotton	White
	193325	39C2939C5	288	Women's T-Shirt	L	Cotton	White
	193324	38C2838C5	288	Women's T-Shirt	M	Cotton	White
	193321	35C2535C4	288	Women's Dress	XL	Sequin	Ruby Red
	193317	31C2131C4	288	Women's Dress	XS	Sequin	Ruby Red
	193319	33C2333C4	288	Women's Dress	M	Sequin	Ruby Red
	193320	34C2434C4	288	Women's Dress	L	Sequin	Ruby Red

Purchase_Order_Items

Product_ID	Item_Number_ID	Quantity_Ordered	Quantity_Delivered	Item_Price	n_Discount
1203					
	1203-103213	1	1	$10.0	0.00%
1204					
	1204-103214	2	2	$20.0	0.00%
1205					
	1205-103215	3	3	$30.0	0.00%
1206					
	1206-103216	10	10	$100.0	0.00%
1207					
	1207-103217	5	5	$50.0	0.00%
1571					
	1571-712032	9	9	$90.0	0.00%
1572					
	1572-712033	10	10	$100.0	0.00%
1573					
	1573-712034	8	8	$80.0	0.00%
1574					
	1574-712035	10	10	$100.0	0.00%
1575					
	1575-712036	0	0	$0.0	0.00%
1963					
	1963-127732	9	9	$450.0	0.00%
1964					
	1964-127733	7	7	$350.0	0.00%
1965					
	1965-127734	10	10	$500.0	0.00%

Store

Store_ID	Store_Name	Street_Address	Store_County	Store_Manager	Phone_Number	Email_Addre
288						
	Clothes4You	371 Walt Whitmar	Huntington	Amber Hurtdepp	631-501-9431	You4Clothes

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Vendor

Vendor_ID	Company_Name	Street_Address	State	City	stal_Code	Country	Phone_Number
1234567	Pants&Shirts Incorp.	7255 East Saxon Street	IL	Wheaton	60187	USA	217-108-6453
1234568	Quinobinolino Stuff	43 Evergreen Street	VA	Colonial Heights	23834	USA	757-482-5036
1234569	Lockport Clothes	191 Myers Drive	MA	Burlington	18031	USA	508-853-1796
1234570	Newbridge Manufactures	607 Gonzales Court	PA	Erie	16506	USA	412-4532-1001
1234571	Rocklin Corporated	34 Mechanic Street	FL	Clearwater	33756	USA	352-904-7234
1234572	Bedford & Sons	8375 Garden Street	WI	Racine	53402	USA	608-213-4897
1234573	Nat Knows Clothes Inc.	9020 Lower River Street	MI	Dearborn Heights	48127	USA	616-879-6521
1234574	Shirt&Pants Incorp.	88 Howard Drive	GA	Ringgold	30736	USA	912-195-6987

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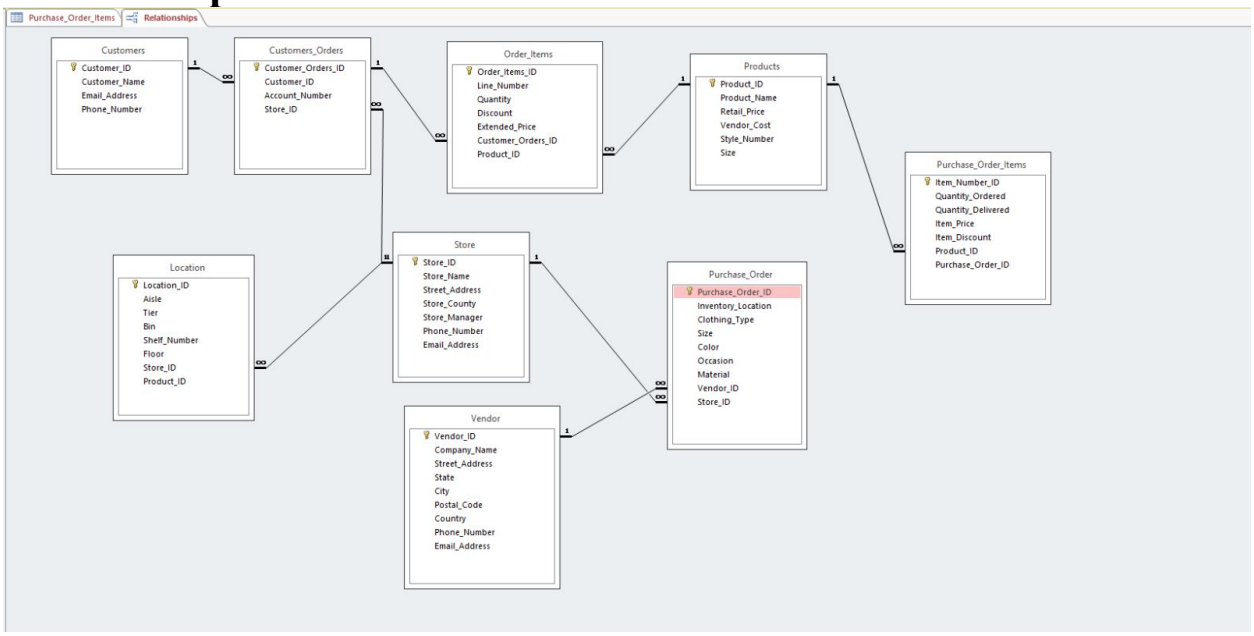
Relationships:



Conclusion:

Group 14's main form of software and services used to coordinate all our activities were WhatsApp, Zoom, and in-person meet ups. Additionally, we used Lucid-Chart, Microsoft Access, and Google Docs.

It was agreed on that the easiest step was creating the initial idea for our group project. We all believed that a system which created a solution with regards to inventory management for our clients and their customers was important. We then started to formulate the way we wanted to approach this project and the roles we would each take to successfully use our strong specialties to finish this project.

The most difficult part of this project was creating the SQL Code and queries in Microsoft Access. This part was a weakness for most of the group and we had to heavily rely on each other. By the end we were able to collaborate, and with honest on what he knew and did not know, we were able to figure it out and complete it.

If we were able to do it all over again, we would improve communication. It became difficult at times to figure out times to meet and complete our work with all of us having such different schedules. However, with better communication Group 14 could certainly have been more successful with less stress.

We believed that our original objective was completed with the use of our new system. Stores were able to keep track of their inventory seamlessly and more efficiently and customers were able to find items easier.

Overall, this project was an amazing way to apply the topics we learned in class throughout the semester. Additionally, with each milestone we were working towards this larger reporter which helped it be easier to complete without scrambling for results and answer. This was a great project to force us to think about this course in a "real world way" and collaborate with classmates.