CPS 5740 Team Research

Walmart

http://www.walmart.com

Team members

1.Chen-Kai Tsai. : Business staff - Project manager.

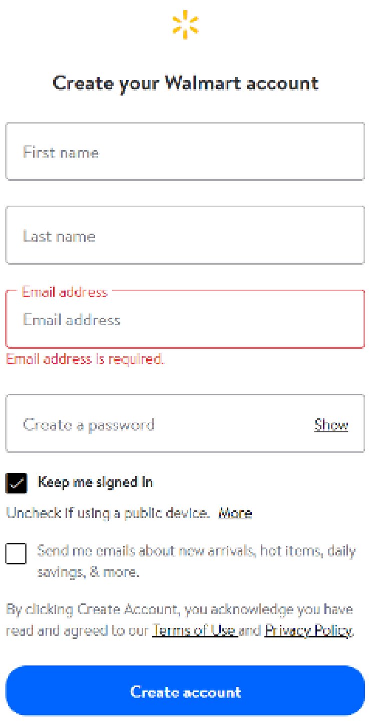
2.Juan Cardona: Database designer.

3.Nahla Al Hamad: Software developer.

4.Patrick Seguin: System engineer.

All the team members worked together and shared thoughts and ideas.
First, we discussed the basic idea, we explored the Walmart website and made the main elements that we needed for the website, then we added the attributes for each element, and discussed the relations between the elements, then we drew the ER. diagram, and discussed the details about each process in the online order, we created the tables according to the ER diagram, then we added the functions that we needed.

Question A, B



Create your Walmart account

First name

Last name

Email address

Email address

Email address is required.

Create a password Show

☑ Keep me signed in

Uncheck if using a public device. More

☐ Send me emails about new arrivals, hot items, daily savings, & more.

By clicking Create Account, you acknowledge you have read and agreed to our Terms of Use and Privacy Policy.

Create account

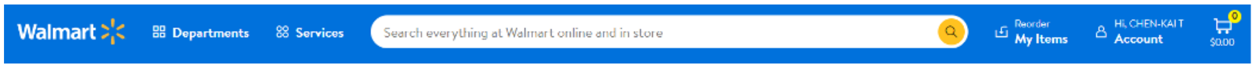
A:

1. **First name, Last name, Email address, Create a password**

The name, email address and password are all strings. For “First name”, “Last name” and “Email address” should use <*input type*="*text*">. As for “Create a password” we should use <*input type*=”*password*”> which will prevent the plain text from showing on the screen.

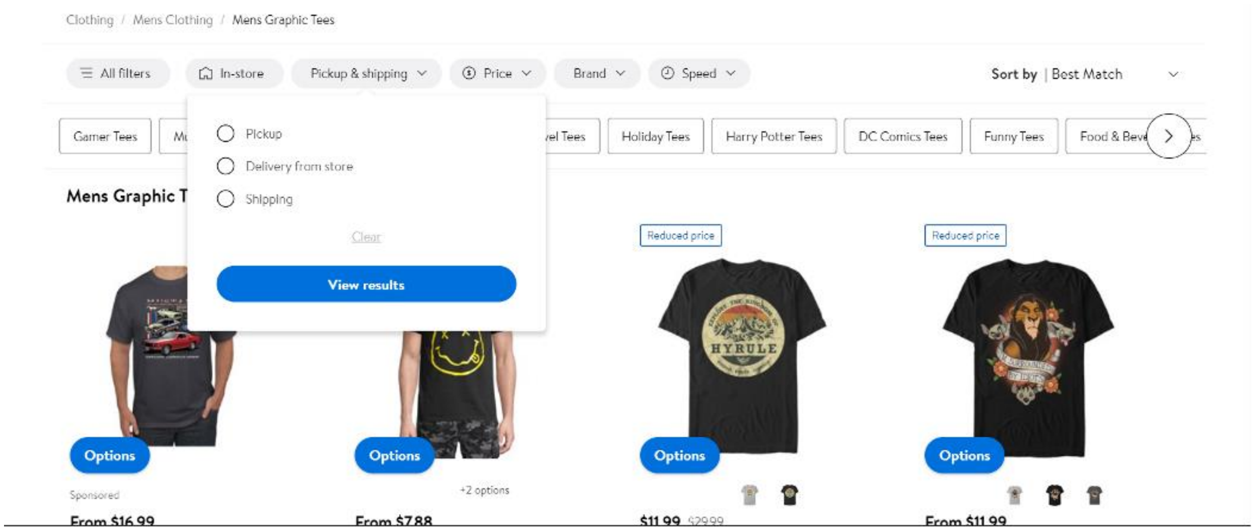
2. **Keep me signed in, send me email about new arrivals, hot items, daily savings & more.**

This should be <*input type*=”*checkbox*”>. Since this is an optional input, a default value can be provided.



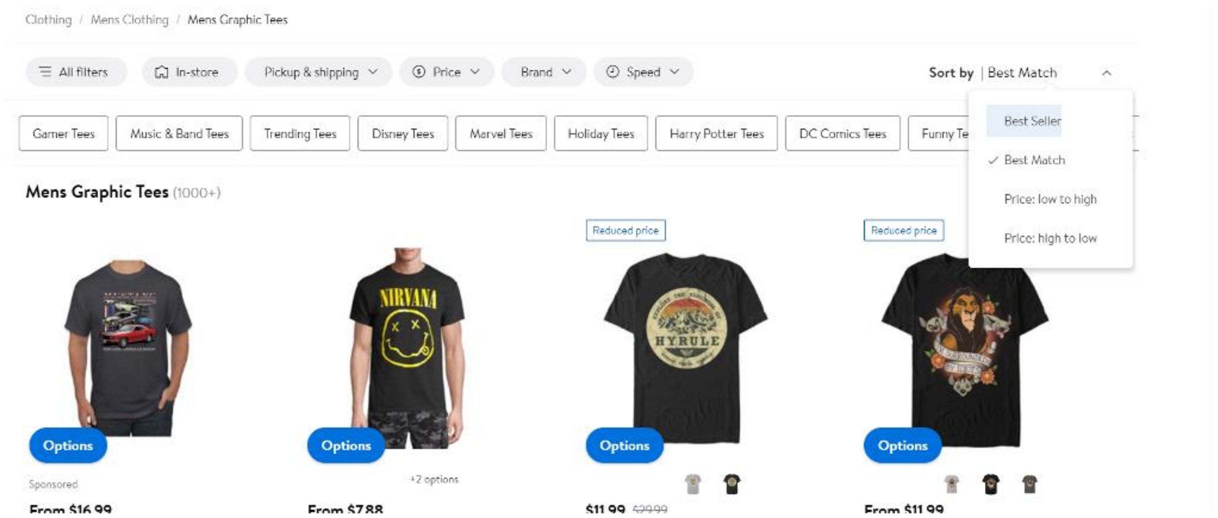
3. **Search everything at Walmart online and in store**

For search bar in the website, we should use either <*input type*=”*search*”> or <*input type*=”*text*”>. Both input types are basically the same; however, we can use search as input type for styling purpose.

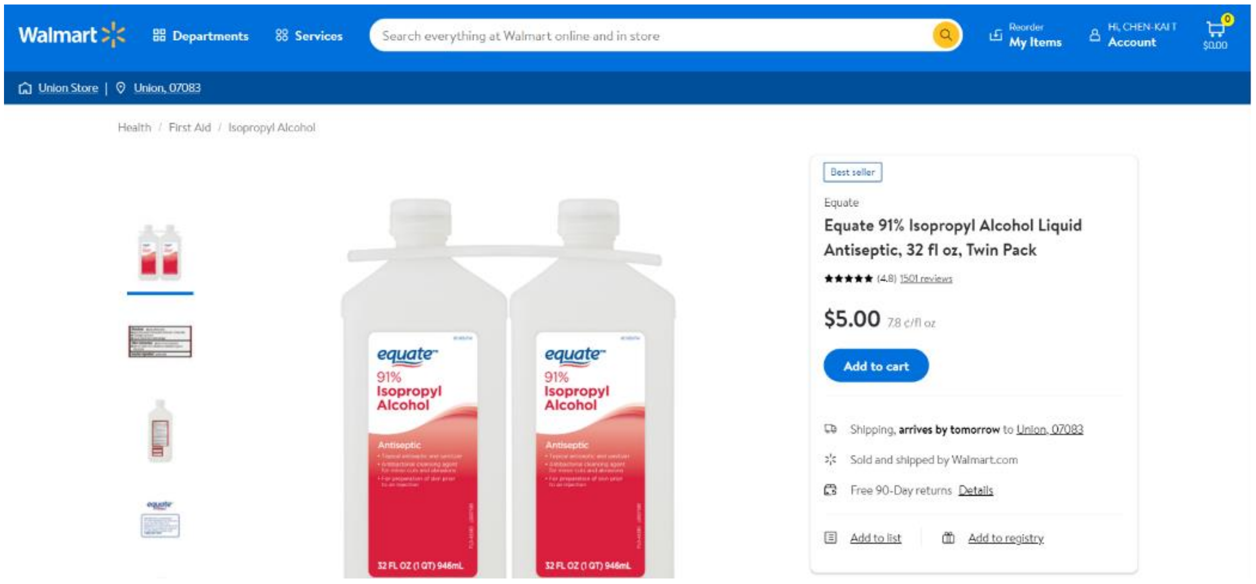


4. **Pickup, Delivery from store, Shipping**

These should use <*input type*=”*radio*”> because only one option allowed. If we need multiple options, we should use <*input type*=”*checkbox*”>



5. **Sort by {Best Match, Best Seller, Price: low to high, Price: high to low}**
This sort by options should be a drop-down list (<*input type*=*"select"*>) because there are many options and we want to put this input into a smaller space where there is not much space to show all the options.


Walmart
Departments
Services
Search everything at Walmart online and in store
Reorder
My Items
Hi, CHEN-KAI T
Account
$0.00
Union Store | Union, 07083
Health / First Aid / Isopropyl Alcohol
Best seller
Equate
Equate 91% Isopropyl Alcohol Liquid Antiseptic, 32 fl oz, Twin Pack
(4.8) 1501 reviews
$5.00 7.8 c/fl oz
Add to cart
Shipping, arrives by tomorrow to Union, 07083
Sold and shipped by Walmart.com
Free 90-Day returns Details
Add to list
Add to registry

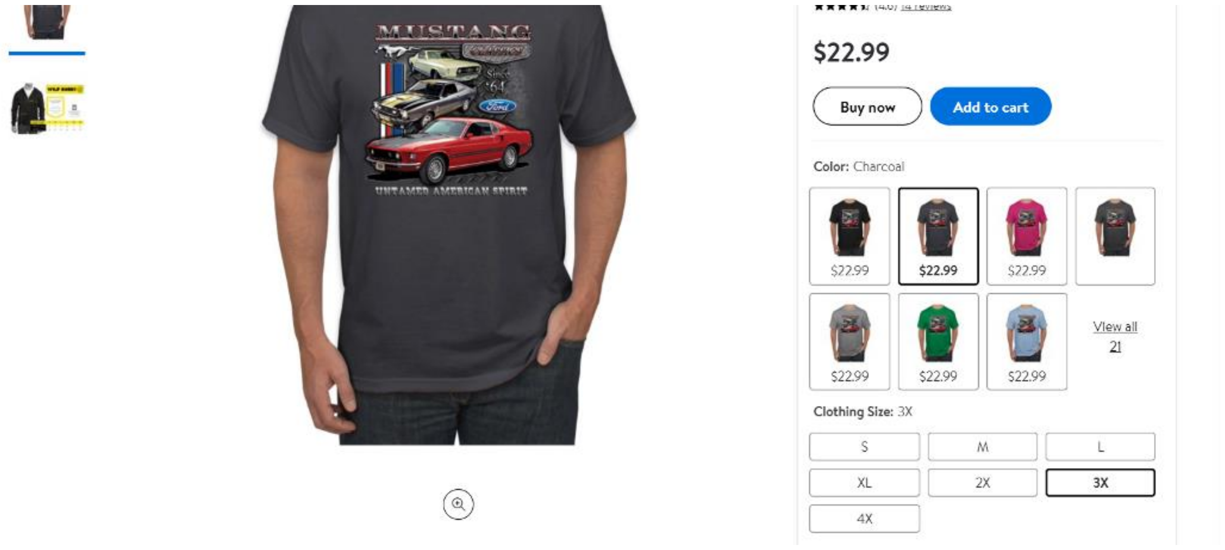
1. Picture
In our opinion, pictures should be stored in the server disks rather than store in the database. Therefore, the data type should be VARCHAR which can store strings and the content should be the file path or URL to the picture source.

2. Price

In our opinion, it should be in DECIMAL(a, b) where a and b are not desired precision of the price. We don't use floating point type is because floating points have rounding errors and should not be used to compare if two numbers are equal.

3. Product Name

This should be in VARCHAR which is a dynamically scaling string. We should not enforce a fixed length string in this case because product names can have varying size and the difference of their length can be big. Additionally, the length of the product name should be limited. Websites such as eBay has an 80-character limits on the product listing name.


(4.6) 14 reviews

$22.99

Buy now | Add to cart

Color: Charcoal

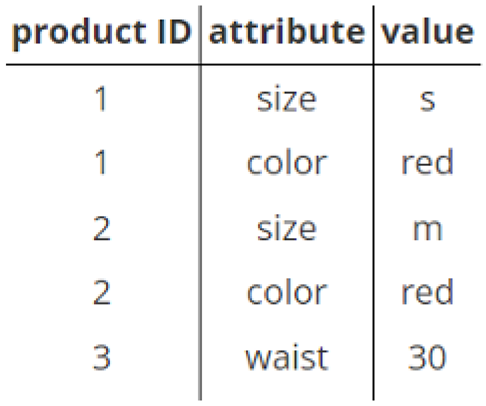
$22.99 | $22.99 | $22.99 |
$22.99 | $22.99 | $22.99 | View all 21

Clothing Size: 3X

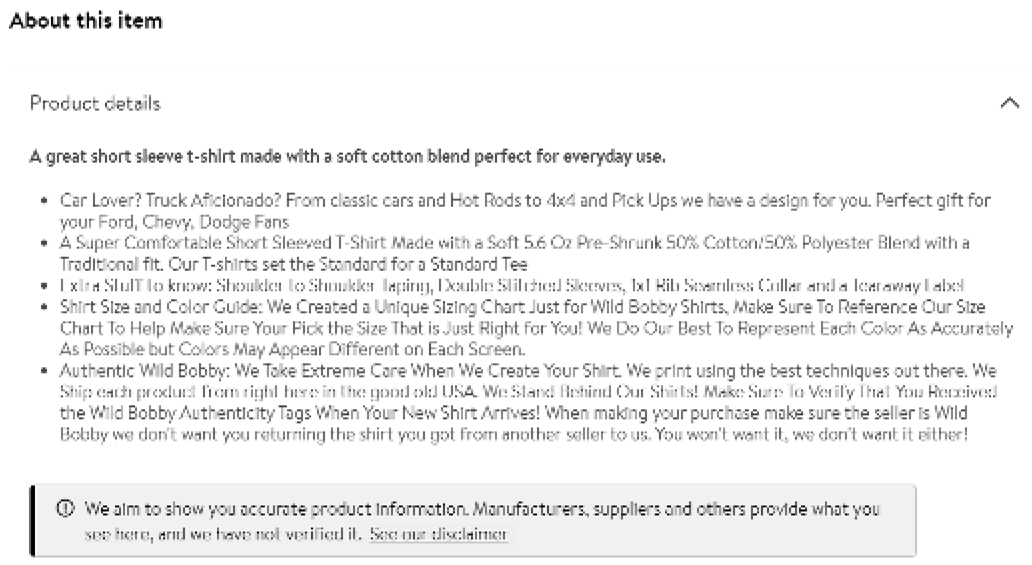
S | M | L
XL | 2X | 3X
4X

4. Clothing Size:

Since it's a multi-value attribute, we should store it in a separate table. The table should include product id and clothing size so that each product can have a different set of clothing sizes. In general, we can have a table to store all the attributes of products. The table will include at least three columns which includes product ID, attribute which can be available sizes, colors or waist sizes, and a value for the attribute. The following is an example.



product ID	attribute	value
1	size	s
1	color	red
2	size	m
2	color	red
3	waist	30



About this item

Product details

A great short sleeve t-shirt made with a soft cotton blend perfect for everyday use.

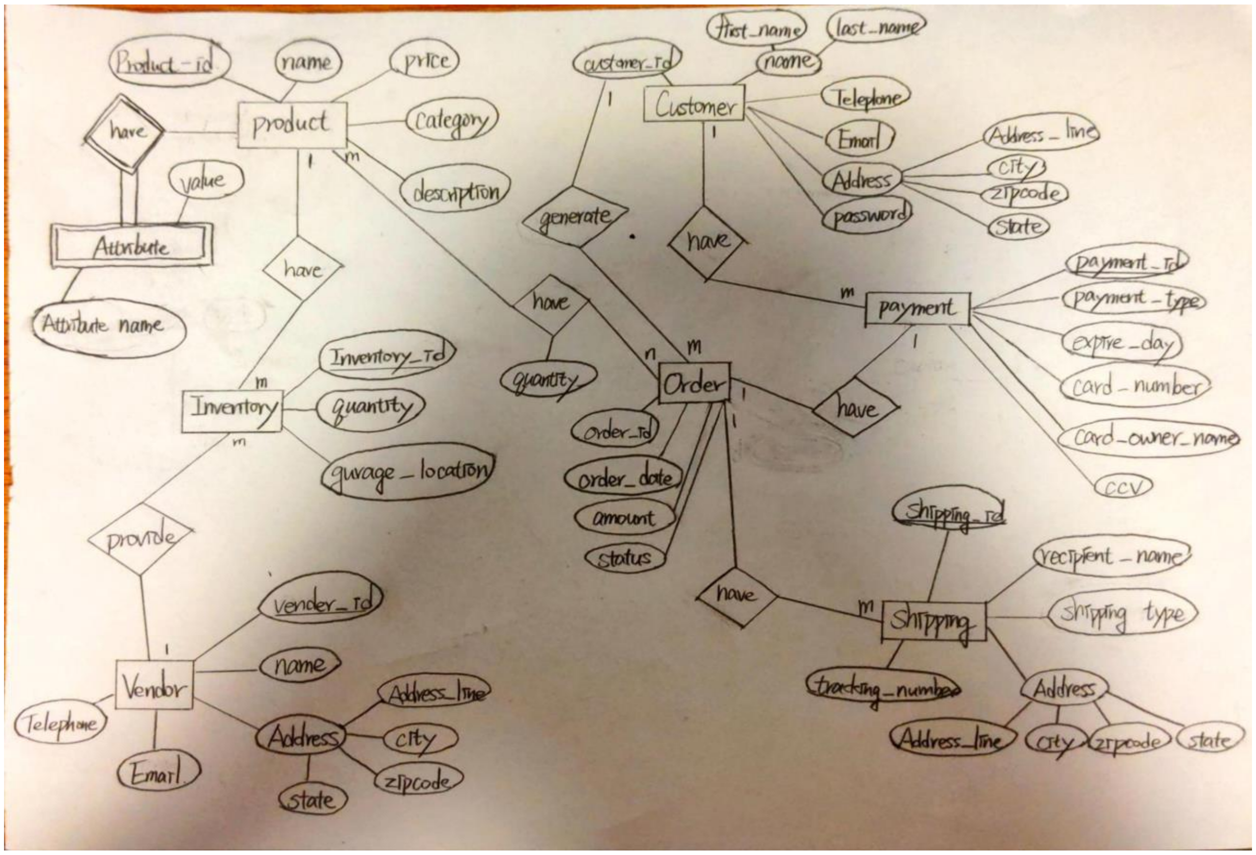
- Car Lover? Truck Aficionado? From classic cars and Hot Rods to 4x4 and Pick Ups we have a design for you. Perfect gift for your Ford, Chevy, Dodge Fans
- A Super Comfortable Short Sleeved T-Shirt Made with a Soft 5.6 Oz Pre-Shrunk 50% Cotton/50% Polyester Blend with a Traditional fit. Our T-shirts set the Standard for a Standard Tee
- Extra Stuff to know: Shoulder to Shoulder Taping, Double Stitched Sleeves, 1x1 Rib Seamless Collar and a Tearaway Label
- Shirt Size and Color Guide: We Created a Unique Sizing Chart Just for Wild Bobby Shirts, Make Sure To Reference Our Size Chart To Help Make Sure Your Pick the Size That is Just Right for You! We Do Our Best To Represent Each Color As Accurately As Possible but Colors May Appear Different on Each Screen.
- Authentic Wild Bobby: We Take Extreme Care When We Create Your Shirt. We print using the best techniques out there. We Ship each product from right here in the good old USA. We Stand Behind Our Shirts! Make Sure To Verify That You Received the Wild Bobby Authenticity Tags When Your New Shirt Arrives! When making your purchase make sure the seller is Wild Bobby we don't want you returning the shirt you got from another seller to us. You won't want it, we don't want it either!

We aim to show you accurate product information. Manufacturers, suppliers and others provide what you see here, and we have not verified it. See our disclaimer

5. Product detail

In our opinion, this can be stored in the database or can be loaded from other text file. If we want to store this in our database, it should be MEDIUMTEXT type which can store up to 16MB size of text data. However, this will have few issues such as increasing database size which will waste storage space if we want to back up the database, and increasing difficulty to update the data which will need SQL query to do it. On the other hand, if we want to loaded from the other text files, we only need to store the file path in the database.

C.



D.

```
CREATE TABLE product (
   pid INT PRIMARY KEY AUTO_INCREMENT NOT NULL,
   name VARCHAR(25)NOT NULL,
    price DEC(13,2)NOT NULL,
    category VARCHAR(25)NOT NULL,
    description VARCHAR(100),
    aid INT NOT NULL
);
```

```
CREATE TABLE customer (
   cid INT PRIMARY KEY AUTO_INCREMENT NOT NULL,
   first_name VARCHAR(30)NOT NULL,
   last_name VARCHAR(30)NOT NULL,
   email VARCHAR(25)NOT NULL,
   phone VARCHAR(15)NOT NULL,
   address VARCHAR(36)NOT NULL,
   city VARCHAR(15)NOT NULL,
   state VARCHAR(15)NOT NULL,
   zipcode VARCHAR(15)NOT NULL,
   password VARCHAR(35)NOT NULL
);

CREATE TABLE inventory (
   iid INT PRIMARY KEY AUTO_INCREMENT NOT NULL,
  `pid` int(11) NOT NULL,
   quantity INT NOT NULL,
   location VARCHAR(25),
   FOREIGN KEY (pid) REFERENCES product(pid)
);

CREATE TABLE payment (
   payid INT PRIMARY KEY AUTO_INCREMENT NOT NULL,
   payment_type VARCHAR(10) NOT NULL,
   provider VARCHAR(10) NOT NULL,
   card_num VARCHAR(16) NOT NULL,
   exp_date DATE NOT NULL,
   ccv VARCHAR(4) NOT NULL,
   name_card VARCHAR(25)NOT NULL
);

CREATE TABLE shipping (
   shipping_id INT PRIMARY KEY AUTO_INCREMENT NOT NULL,
   method_company INT NOT NULL,
   trackingid INT NOT NULL,
   address VARCHAR(30) NOT NULL,
    city VARCHAR(15) NOT NULL,
    zipcode VARCHAR(15) NOT NULL,
    state VARCHAR(15) NOT NULL,
    recipient_name VARCHAR(30) NOT NULL,
     type VARCHAR(30)NOT NULL
);

CREATE TABLE vendor (
vid INT PRIMARY KEY AUTO_INCREMENT NOT NULL,
name VARCHAR(30) NOT NULL,
address VARCHAR(35) NOT NULL,
city VARCHAR(15) NOT NULL,
 state VARCHAR(15) NOT NULL,
 zipcode VARCHAR(15) NOT NULL,
 phone VARCHAR(15) NOT NULL,
 email VARCHAR(35)NOT NULL
);

CREATE TABLE orders (
    oid INT PRIMARY KEY AUTO_INCREMENT NOT NULL,
    date DATE NOT NULL,
    amount DEC(13,2) NOT NULL,
    status VARCHAR(20) NOT NULL,
    discount DEC(13,2) NOT NULL,
    `cid` int(11) NOT NULL NOT NULL,
    `payid` int(11) NOT NULL NOT NULL,
    `pid` int(11) NOT NULL,
    `trackingid` int(11) NOT NULL
    FOREIGN KEY (cid) REFERENCES customer(cid),
    FOREIGN KEY (payid) REFERENCES payment(payid),
    FOREIGN KEY (pid) REFERENCES product(pid),
    FOREIGN KEY (trackingid) REFERENCES shipping(trackingid)
);

CREATE TABLE product_order (
   `pid` int(11) NOT NULL,
   `oid` int(11) NOT NULL,
    quantity INT NOT NULL,
    FOREIGN KEY (pid) REFERENCES orders(pid),
    FOREIGN KEY (oid) REFERENCES orders(oid)

);
```

```
CREATE TABLE `attribute` (
  `pid` int(11) NOT NULL REFERENCES product(pid),
  `attribute_name` varchar(25) NOT NULL,
  `value` varchar(20) NOT NULL,
);
```

pid is the primary key from product table and attribute name store the attribute name for a specific product attribute such as size, color or term of warranty. The value will be the correspond to the attribute indicated in the attribute name such as M, red, 3-years.

E.

Function 1…. Amount_after_discount:
Type: data calculation.
This function will take 2 parameters,both will be float, the first parameter is the product price or the order total amount and the second is the discount amount,it will calculate and return the product price or the order total amount after the given discount.

The code as following:

```
DELIMITER //
create function amount_after_discount(price float, product_price float)
    RETURNS float
     NOT DETERMINISTIC
    BEGIN
   declare amount float;
   set amount=product_price-((price*product_price)/100);
           return amount;

   END //
```

Considering the order order id=112 and the given discount on the total order =10%
The sql statement to show the amount will be:
Select amount_after_discount(amount,10) from orders where oid=112;

Function 2….get_Total_after_tax
Type: data calculation.
This function will take 2 parameters, the first parameter is the order total amount and it will be float, the second parameter will be the state where the order will be shipped to

and it will be char, the function will return float value ,it will calculate the order plus the amount of the tax for this state.

The code as following:

```
DELIMITER //
create function get_Total_after_tax(total float, state char)
    RETURNS float
     NOT DETERMINISTIC
    BEGIN
    declare tax float default 0;
        declare cost float default 0;

if state='AL'  then
set tax=total * 0.004 ;
set cost= total+tax;

elseif state='AR'  then
set tax=total * 0.065 ;
set cost= total+tax;

elseif state='CA'  then
set tax=total * 0.0725 ;
set cost= total+tax;

elseif state='CO'  then
set tax=total * 0.029 ;
set cost= total+tax;

elseif state='NJ'  then
set tax=total * 0.07 ;
set cost= total+tax;

elseif state='NY'  then
set tax=total * 0.04 ;
set cost= total+tax;
end if;
            return cost;

   END //
```

Considering the state is NJ and the total amount = 33.3, the sql statement to insert the amount to orders table will be:
Insert into orders(amount)values(get_Total_after_tax(33.3,’NJ’));

Function 3….check_inventory

Type: Data input, return and output.

This function will get 2 parameters, the first is the product id int type, the second is the quantity int type, it will check if the quantity of the product that the customer ordered is available in the inventory, it will return 0 for not available and the number of the product the customer ordered if they are available

The code as following:

```
   create function check_inventory(product_id int, quantity int)
    RETURNS int
     NOT DETERMINISTIC
    BEGIN
    declare qty int  default 0;
     set qty=(select quantity from inventory where pid=product_id);
     if(quantity>qty) then
     return 0;
     else return qty;
      END //
```

In this example considering the product id=1002 and the customer ordered 5 items of this product ,the sql statement to insert the quantity of this product to orders table will be:
Insert into product_order(quantity) values(check_inventory(1002,5));

Function 4….search_function

Type: Data retrieval.

Join product table, vender table, product attribute table, and inventory table. Use regular expression to compare search keyword with the name and category. MySQL default regular expression is not case sensitive.

```
Search function (Search_text)
{
        // parse the Search_text
        Parsed_text = Parse_Searchtext(Search_text)

        // Use parsed text to do pattern matching in database
        Search_database(Parsed_text)
}
```

```
-- SQL query within the Search_database function
SELECT concat(P.name, ’ ’, V.name) AS name, P.price, I.quantity, P.category
FROM Product P, Inventory I, Vendor V
WHERE P.Product_id=I.Product_id AND V.Vendor_id=I.Vendor_id
AND (name REGEXP '$Parsed_text' OR P.category REGEXP '$Parsed_text')
```

I concated the name of the product and vendor because when I search for a product on Walmart, all the names start with vendor and then the product name. I think it can be done by either using a category or vendor. In our case, I think a vendor name will be a better option. I choose to search category instead of description because the description can have many different possible words that have nothing to do with the product. The category might help the customer to search for the same type of product. I concated the vendor’s name with the product name so that the customer can search with the brand name.