Database Design and Implementation

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Contents

1 Requirement Analysis (15%)

1.1 Description of the three websites chosen

1.1.1 http://www.sainsbury.co.uk

1.1.2 http://www.asda.com

1.1.3 http://www.tesco.com

1.2 List of data fields (Entities and their attributes)

The tables below include all the attributes that are inside each website analysed. Because there was a vast variety of categories sold in the websites the same product was bought in all the sites (shampoo). The collection of the attributes starts when a product is selected and ends when the product is ordered. Some of the attributes are duplicates but at these tables they are not yet removed. Also, some of the attributes collected have preselected answers and others do not have any user input at all. Additionally, the attributes are separated into four distinct categories, Grey is used for user related attributes, Blue is used for product related attributes, Yellow for checkout related attributes and lastly Green for payment related attributes.

1.2.1 List of data fields from website 1

Email	Reviews	Select your address
Verification code	Sponsored	building name
Title	Product name	or building number
First name	Quantity	Flat number if relevant
Last name	Allow substitute	Street
Mobile number	price / ml	Town or city
Password	Trolley price	County(optional)
Confirm password	Including savings	Delivery instructions (optional)
Terms and conditions	Trolley total	Choose a billing address
Postcode	Click and collect	or, add a different address
Nectar card number	Delivery information	where did you hear about us
Communication preferences	Disclaimer	Before you go
Product Title	Delivery details	Order summary
Product price	Standard slot *	Delivery details
Quantity	Saver slot *	Is someone at the delivery address self-isolating?
price / ml	Delivery feedback	E-gift card and Coupons
Description	Slot details	Order summary
Ingredients	Delivery address	Substitution preferences
Preparation	You could be saving with a delivery pass	Name on card
Country of origin	Greener grocery delivery	Card number
Packaging	Using a voucher?	Expires end
Ratings summary	Address nickname	Card security code
Item code	Postcode	

Table 1: Sainsbury's attributes.

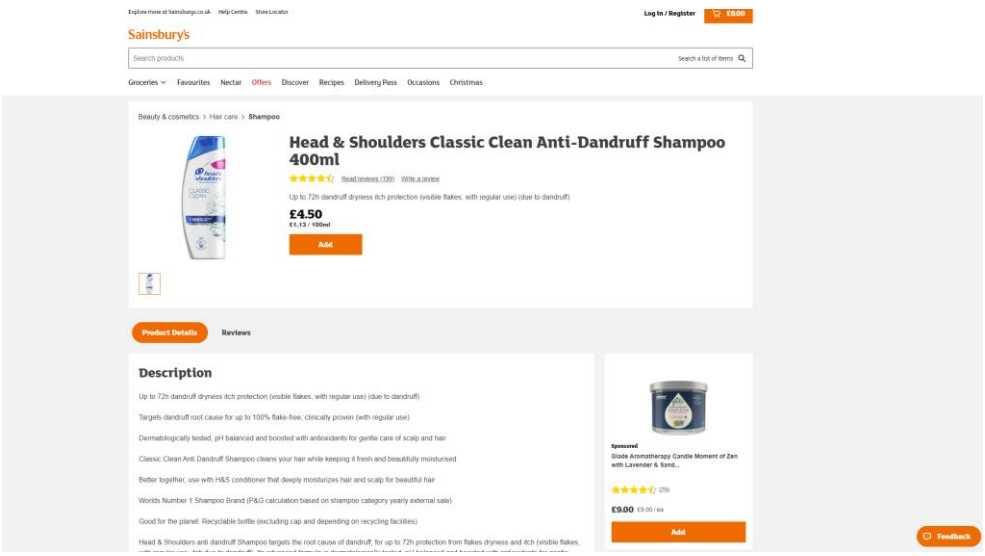


Figure 1: Screenshot when viewing the product on Sainsbury's.

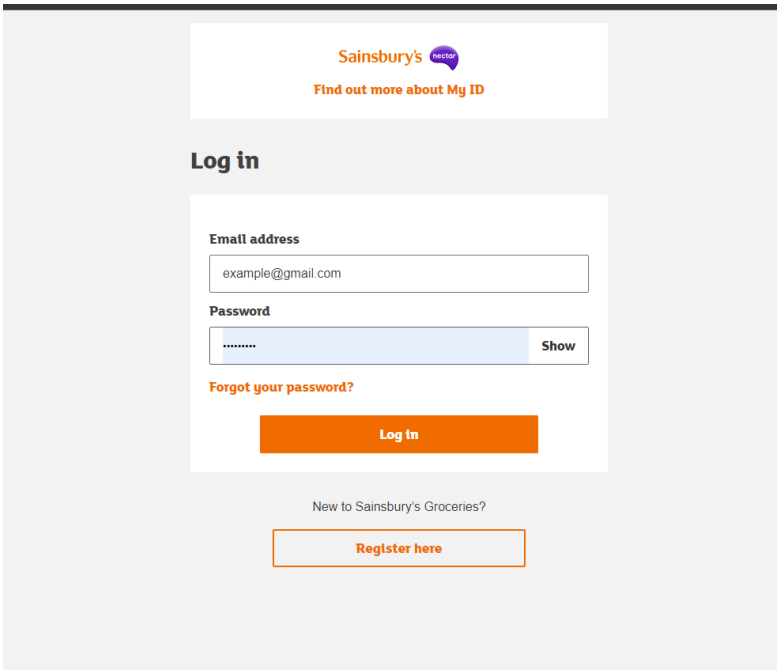


Figure 2: Screenshot when viewing the login on Sainsbury's.

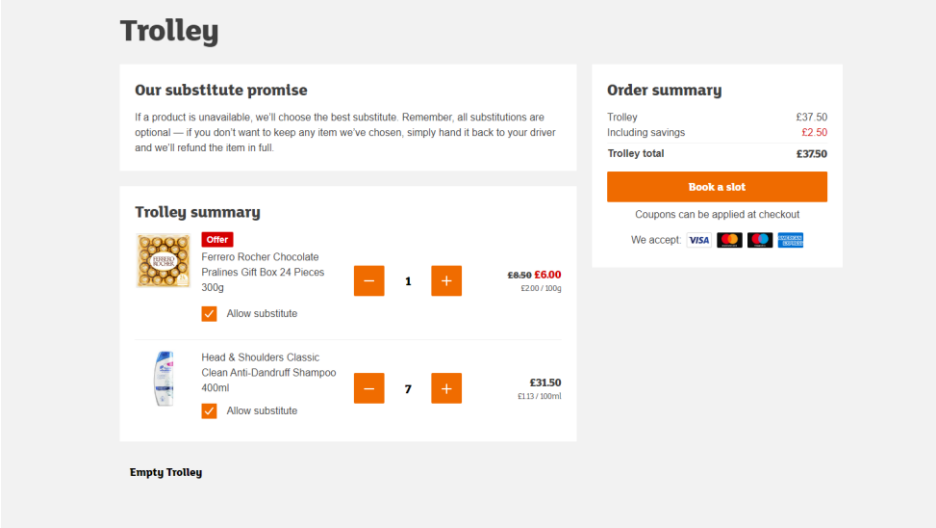


Figure 3: Screenshot when viewing the trolley on Sainsbury's.

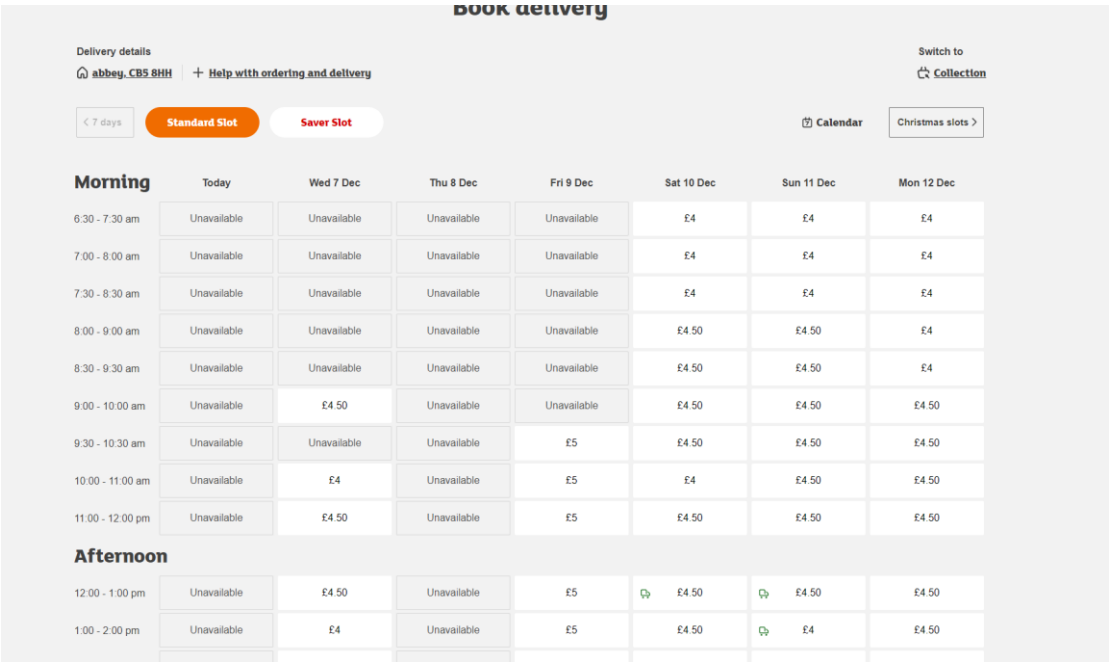


Figure 4: Screenshot when viewing book a slot on Sainsbury's.

1.2.2 List of data fields from website 2

Email*	Product information	Contact number*
Password*	Preparation and usage	I am over 18 years old*
Yes, I wand Asda and George to contact me	Storage type	Delivery instructions
Title*	Return to	Charitable donations
First name*	ASDA product information	Gift card code
Last name	Reviews	scratch-off panel code
Your postcode*	Shopping total	shopping total
House number or name*	Multibuy savings	Pick, pack and delivery
Enter phone number*	Products	Minimum basket charge
Country code*	Incomplete Offers	Donate to charity
Yes, make my experience more personal, by using my date of birth	Customers like you also bought	eVouchers
Product title	Do you have everything you need? Why not try	Multibuy savings
Product code	Sponsored products you might like	Gift cards
Product properties	Your postcode*	Add an voucher
Price / ml	House no./name*	Total amount
Sponsored product you might like	Select address*	Card number*
3 for £10 Buy 2 more to get the offer (Offers)	Address line 1	Name on card*
Net content	Address line 2	Expiry date*

Ingredients	City or town*	Billing address*
Features	Property type*	Non-UK billing address?
Safety warning	Title*	Save card for future transaction
Country of origin	First name*	
Packed in	Last name*	

Table 2: Asda attributes.

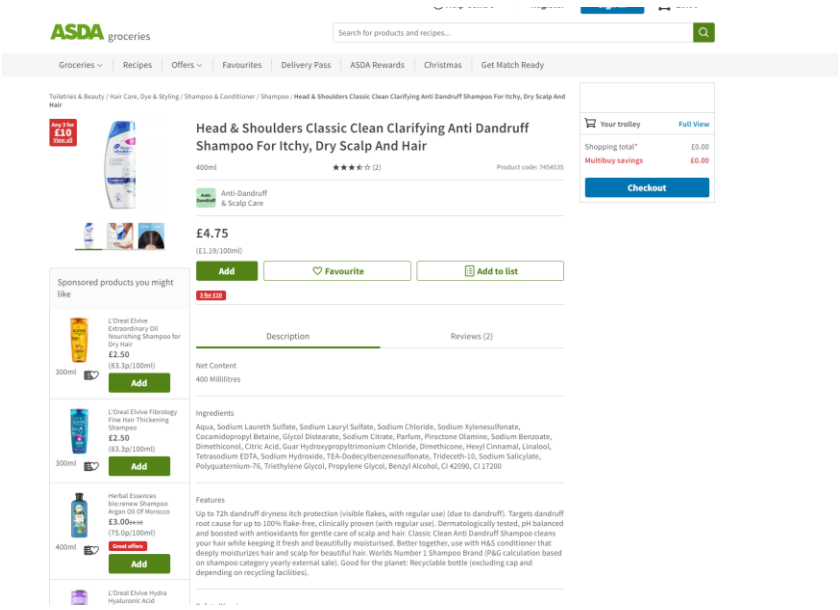


Figure 5: Screenshot when viewing the product on asda.

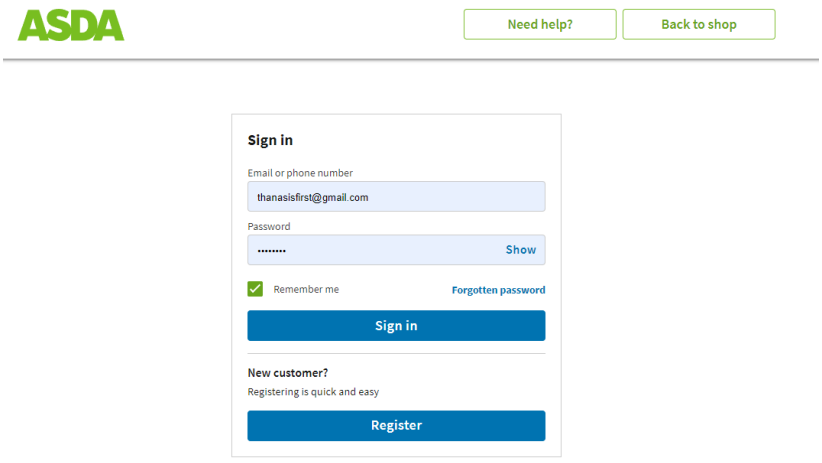


Figure 6: Screenshot when viewing the login on asda.

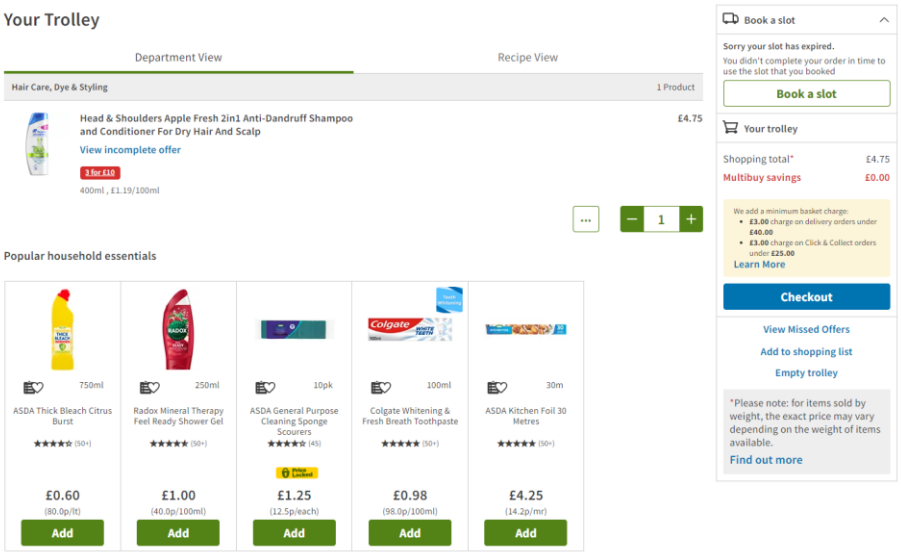


Figure 7: Screenshot when viewing the trolley on asda.

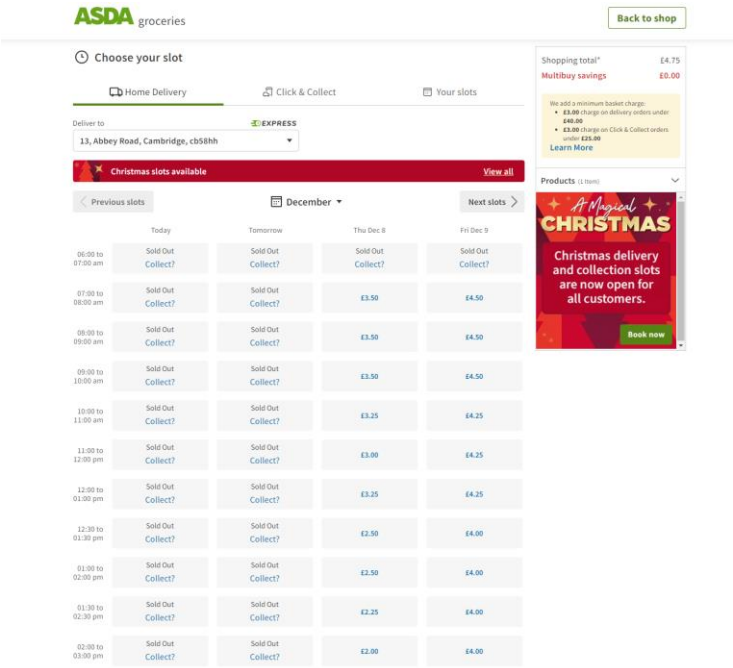


Figure 8: Screenshot when viewing book a slot on asda.

1.2.3 List of data fields from website 3

Email address*	Produce of	Promoted Offers
Set password*	Preparation and usage	Popular Offers
Join Clubcard, it's free and saves you money	Warnings	My clubcard vouchers and coupons
Title*	Return to	Address line (optional)
First name*	Net contents	Address line (optional)
Last name*	Safety information	Town / City*
Phone number*	Usually bought next	Postcode*
UK Postcode*	using product information	Name on card*
Address line 1*	Reviews	Card number*
Address line 2 (optional)	Substitutions	Expiry date*
Address line 3 (optional)	Allow substitutions	Security code*
Town / City*	search in basket	Address line one*
Marketing communications	Basket summary	Address line (optional)
Product title	popular products in fresh food	Address line (optional)
product price	Book a slot*	Town / City
Product Description	Your delivery address*	Postcode
Product quantity	Your delivery slot*	Country*
Price per/ml	Delivery instructions	Want faster checkout?
Ingredients	Home delivery: Slot booked	

Table 3: Tesco attributes.

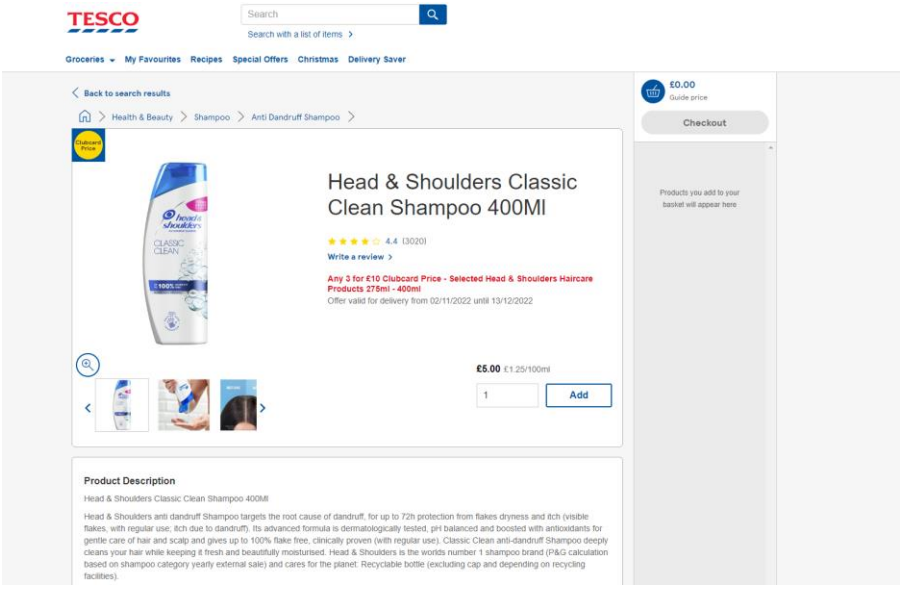


Figure 9: Screenshot when viewing the product on Tesco.

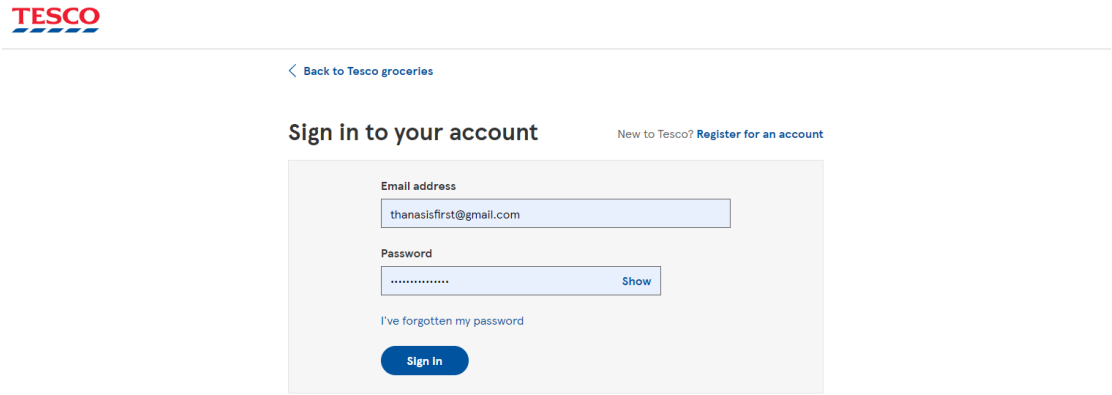


Figure 10: Screenshot when viewing the login on Tesco.

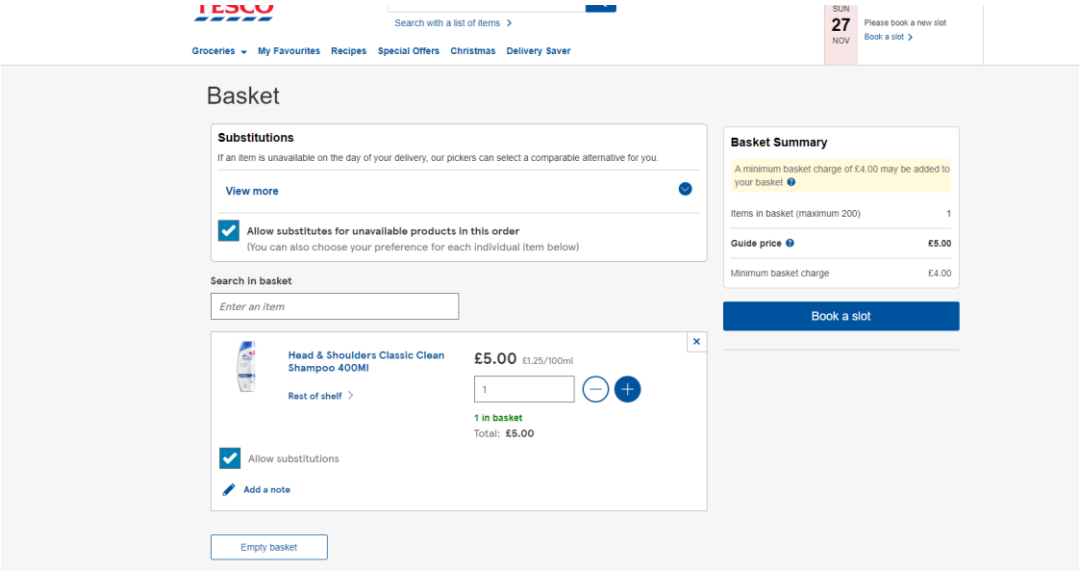


Figure 11: Screenshot when viewing the basket on Tesco.

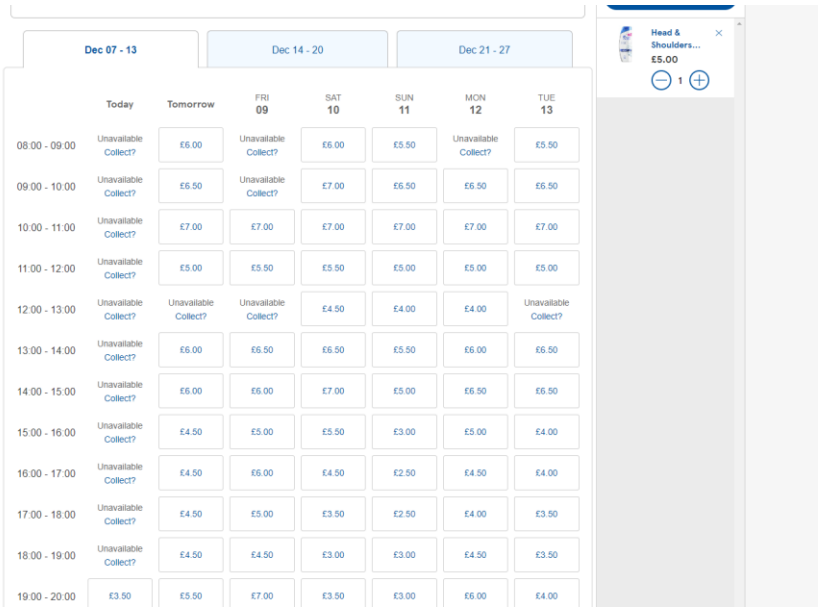


Figure 8: Screenshot when viewing book a slot on Tesco.

1.3 Finalised List

Email	Product properties	County(optional)	
Verification code	Offers	Delivery instructions(optional)	
Title	Net content	choose a billing address	
First name	Product information	where did you hear about us	
Last name	Return to	Is someone at the delivery address self-isolating?	
Password	Warnings	Sponsored product	
Confirm password	Safety information	Substitution preferences	
terms and conditions	Quantity	Address line 1(optional)	
Nectar card number	Allow substitutions	Address line 2(optional)	
Communication Preferences	Trolley total	I am over 18 years old	
Yes I want to be contacted (by the store)	Including savings	Pick, pack and delivery	
Enter phone number	Delivery information	Minimum trolley charge	
Country code	Disclaimer	Name on card	
Yes, make my experience more personal by using my date of birth	delivery feedback	Card number	
Product Title	slot type	Expires number	
Product Price	delivery address	Card security code	
Price / ml	Greener grocery delivery	Non-UK billing address?	
Description	address nickname	Save card for future transaction	
Ingredients	postcode	Join clubcard	
Preparation	select your address	Product estimated expiry date	
Country of origin	building name	Price history	
Packaging	or building number	Feedback competition	
Ratings summary	flat number if relevant		
Item code	Street		
Reviews	town or city		

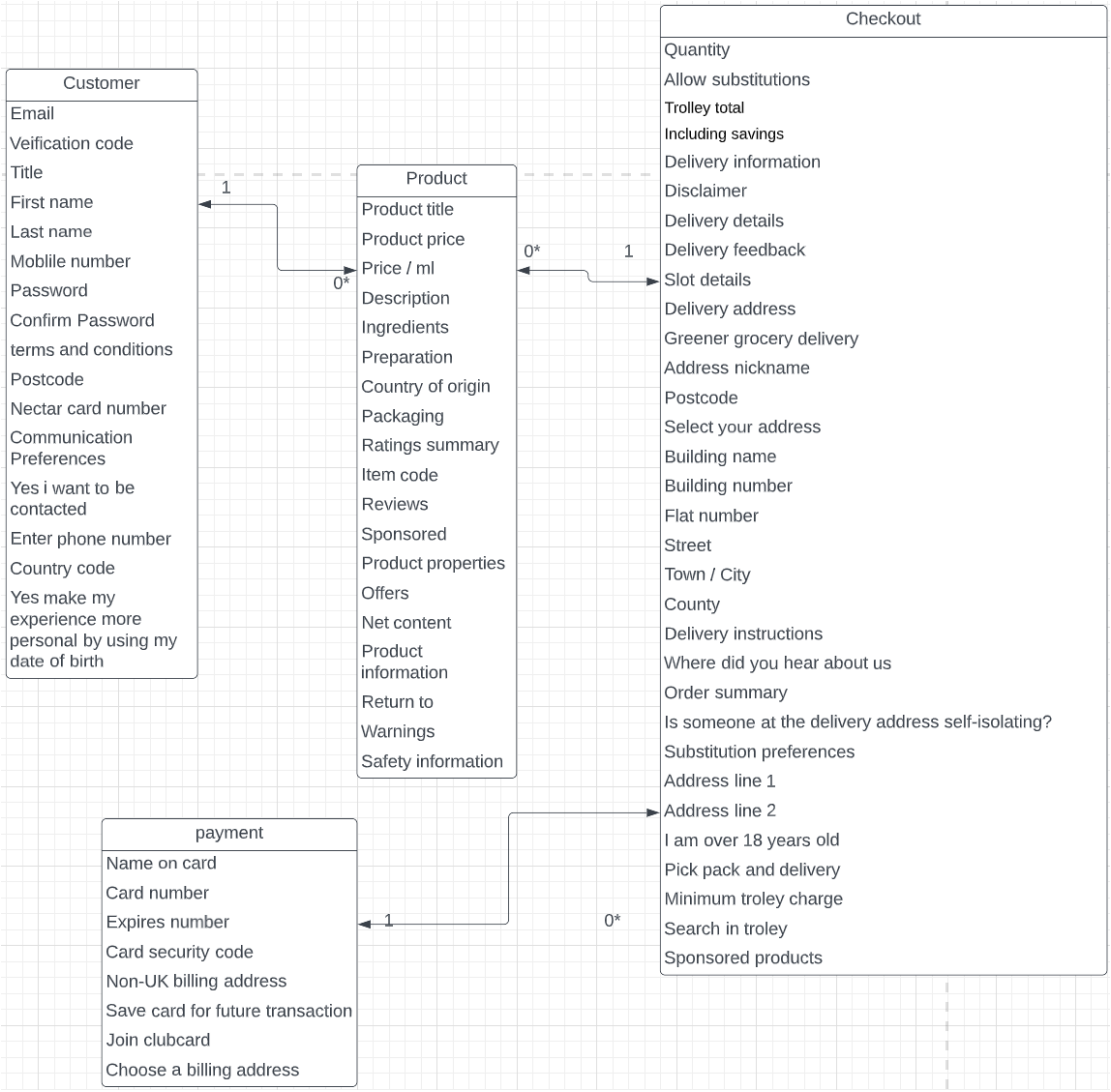
Table 4: Finalized list

The finalized table contains all the attributes from the three websites although in this version all the duplicates are deleted. The colours have the same meaning as the other three tables above. After checking the attributes, it is clearly visible that there are a lot of attempts to make the user add more items to his basket or buy extra services / plans (You could be saving with a delivery pass, Before you go, Incomplete offers, Customers like you also bought, Do you have everything you need, Sponsored products you might like, Usually bought next, Popular products, Greener grocery delivery).
Some extra attributes have also been added to enhance even more the new website such as product estimated expiry date, price history, feedback competition (If the user gives feedback about the website experience he will enter a competition for a prize). Lastly a lot of attributes where removed so normalization could be valid and for simplicity reasons.

2 Database design (25%)

2.1 Entity Relationship Modelling

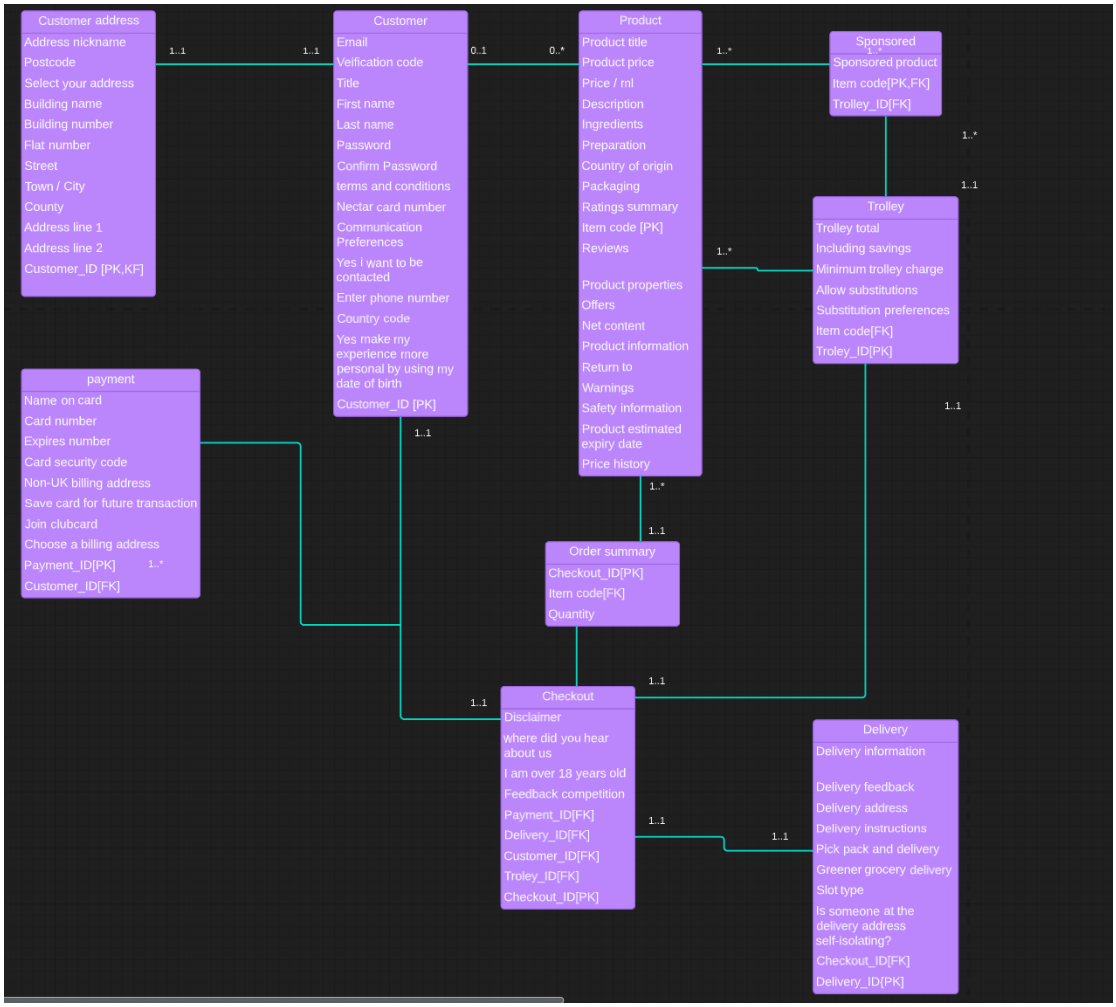
2.1.1 Initial Entity Relationship Model



This ERD is not normalized and was just created to create the foundation of the main EERD. As it is visible relations between the tables have been added for extra help for when designing the EERD. This ERD will be broken into

smaller entities that will compose the EERD although no attributes will be added or removed. This part was very important to be done because it contributes a lot to make a smooth conversion from the attributes tables to a well refined EERD

2.1.2 Extended Entity Relationship Model



2.2 Normalised Model

Database normalisation is the process of arranging data into tables so that queries are always answered in a clear and intended manner. Such normalisation is fundamental to the theory of relational databases. It frequently leads to the establishment of new tables and may have the consequence of duplicating data in the database. (Rouse, 2019)

The normalized model is in part 2.1.2 and in this section 1NF to 3NF is explained.

2.2.1

1NF

There are no duplicated attributes in the database. Although, in some cases they could contain the same information. For example, the user's address stored inside "customer_address" but the user can change it in "Delivery", the user could update his delivery address to the same address as before.

While designing the dataset the "postcode" attribute was inside "customer_adress" and inside "delivery". Also "sponsored" was inside "product". The attributes were removed from delivery so 1NF could be validated.

2NF

No composite keys are included inside the database therefore normalization 2NF passed.

3NF

There is no transitive dependency for non-prime attributes (Rouse, 2019). That means that 3NF is passed. While designing the database some changes had to be done:

“order_summary” table got created because the quantity attribute should not be inside “Checkout”.

“Delivery” table got created because the quantity attribute should not be inside “Checkout”.

2.3 Database Schema

Nine tables are created for this database:

1. Customer (number of attributes 15)
2. Customer address (number of attributes 13)
3. Product (number of attributes 21)
4. Payment (number of attributes 10)

5. Checkout (number of attributes 9)
6. Delivery (number of attributes 11)
7. Trolley (number of attributes 7)
8. Sponsored (number of attributes 3)
9. Order summary (number of attributes 3)

Customer

Attribute name	Type	Description
Email	varchar(319)	The maximum email length is 319 characters (tschabitscher, 2020)
Verification code	varchar(6)	The verification code is 6 characters maximum
Title	enum('Mr',Ms','Mrs','Dr')	Pronouns
First name	varchar(30)	Contains first name
Last name	varchar(50)	Contains last name
Password	varchar(250)	Contains password the longer the password the safest.
Confirm password	varchar(250)	Contains If the user is registering for the first time he needs to make sure he entered the password he wanted to
Terms and conditions	enum('yes','no')	Contains if the user accepts or denies terms and conditions (if they are not accepted the user cant proceed to the next step)
Nectar card number	varchar(19)	Contains If the user wants to he can enter his Nectar card
Communication preferences	tinyint(5)	User is asked how wants to be contacted (5 choices)
Yes I want to be contacted	tinyint(1)	Contains if the user wants to be contacted (yes or no)
Enter phone number	varchar(20)	Contains user's phone number
Country code	varchar(3)	The phone number's country code
Yes make my experience more personal by using my date of birth	enum('yes', 'no')	User is asked if he wants his date of birth to be used for personalization
Customer_ID[PK]	varchar(10)	Primary key

Customer address

Attribute name	Type	Description
Address nickname	varchar(30)	User enters a nickname for the specific address
Postcode	varchar(7)	UK postcode maximum number is 7 (Kurdi, 2021)
Select your address	Enum ('13 abbey road', '20 High Street', '55 Station Road', '8 Main Street')	Inside the brackets are the addresses found from the postcode (“13 abbey road” an example)
Building name	varchar(30)	Contains building name (if applicable)
Building number	smallint(4)	Contains building number (if applicable)
Flat number	smallint(4)	Contains flat number (if applicable)
Street	varchar(40)	Contains user’s street
Town / City	varchar(50)	Contains user’s Town / City
County	varchar(50)	Contains user’s county
Address line 1	varchar(50)	Contains user’s address line 1
Address line 2	varchar(50)	Contains user’s address line 2
Customer_ID[PK,FK]	varchar(10)	Primary and Foreign key

Product

Attribute name	Type	Description
Product title	varchar(80)	Contains the title of the selected product
Product price	decimal(10,2) unsigned	Contains the current price of the product
Price / ml	decimal(10,2) unsigned	Contains the price per ml of the product
Description	varchar(1000)	Contains the description of the product
Ingredients	varchar(1000)	Contains the ingredients of the product
Preparation	varchar(1000)	Contains the preparation needed to use the product
Country of origin	varchar(56)	Contains country of origin of the product [longest country name is (Misachi, 2018)]
Packaging	varchar(100)	Contains information about the packaging
Ratings summary	decimal(10,2) unsigned	Contains the ratings summary of the product
Item code[PK}	varchar(10)	Primary key
Reviews	varchar(1000)	Contains reviews of the product
Sponsored	varchar(50)	Contains other sponsored products that show when viewing the product
Product properties	varchar(1000)	Contains the properties of the product
Offers	varchar(1000)	Contains offers related to the product
Net content	Int(10)	Contains the net content of the product
Product information	varchar(1000)	Contains information about the product
Return to	varchar(1000)	Contains the location to return the item
Warnings1	varchar(1000)	Contains warnings about the item
Safety information	varchar(1000)	Contains safety information about the product
Product estimated expiry date	date	Contains the date that the product is estimated to expire
Price history	varchar(500)	Contains previous prices of the item

Payment

Attribute name	Type	Description
Name on card	varchar(90)	Contains the name of the cardholder
Card number	smallint(16)	Contains the number of the credit card
Expires number	date	Contains the date that the credit card expires
Card security code	smallint(3)	Contains the security code (cvc) of the credit card
Non-UK billing address	enum ('yes', 'no')	Contains if the credit card is registered outside UK
Save card for future transaction	enum ('yes', 'no')	Contains if the user wants the credit card to be saved for when he purchases again from the store.
Join clubcard	enum('yes', 'no')	Contains if the user wants to join clubcard
Choose a billing address	varchar(50)	Contains the address where the credit card is registered
Payment_ID[PK]	varchar(10)	Primary key
Customer_ID[FK]	varchar(10)	Foreign key

Checkout

Attribute name	Type	Description
Quantity	mediumint(3)	Contains the quantity of the products
Disclaimer	varchar(200)	Contains the disclaimer of the whole order process
Where did you hear about us	varchar(200)	Contains asks the user to write where he heard about the store
Order summary	varchar(500)	Contains all the products inside the trolley (NEO ENTITY)
I am over 18 years old	Enum('yes', 'no')	Contains if the user is over 18 years old
Feedback competition	varchar(200)	Contains if the user gives feedback he will enter a competition
Payment_ID[FK]	varchar(10)	Foreign key
Delivery_ID[FK]	varchar(10)	Foreign key
Customer_ID[FK]	varchar(10)	Foreign key
Troley_ID[FK]	varchar(10)	Foreign key
Checkout_ID[PK]	varchar(10)	Primary key

Delivery

Attribute name	Type	Description
Delivery information	varchar(200)	Contains the specific delivery information
Delivery details (DELETE)	varchar(500)	Contains the specific delivery details
Delivery feedback	varchar(200)	Contains the user's delivery feedback
Delivery address	varchar(50)	Contains the delivery address (the user might want a different delivery address so he has the option to change it at the checkout)
Delivery instructions	varchar(200)	Contains the user's delivery instructions (if needed)

Pick pack and delivery	enum(‘yes’, ‘no’)	Contains if the user wants to choose this option
Greener grocery delivery	enum(‘yes’, ‘no’)	Contains if the user wants greener grocery delivery
Slot type	varchar(50)	Contains the slot details that the user chose for the delivery
Is someone at the delivery address self-isolating	enum(‘yes’, ‘no’)	Contains if someone at the delivery address is self-isolating
Checkout_ID[FK]	varchar(10)	Foreign key
Delivery_ID[PK]	varchar(10)	Primary key

Trolley

Attribute name	Type	Description
Trolley total	decimal(8,2), unsigned	Contains the total amount to be paid (before savings if any apply)
Including savings	decimal(8,2), unsigned	Contains the amount to be paid after savings
Minimum trolley charge	Tinyint(5)	Contains the minimum spend the user has to make
Allow substitutions	('yes', 'no')	Contains if the user want substitutions
Substitution preferences	varchar(100)	Contains the user substitution preferences
Item code[FK]	varchar(10)	Foreign key
Trolley_ID[PK]	varchar(10)	Primary key

Sponsored

Attribute name	Type	Description
Sponsored product	varchar(70)	Contains the sponsored products
Item code[PK,FK]	varchar(10)	Primary key, Foreign key
Trolley_ID[FK]	varchar(10)	Foreign key

Order summary

Attribute name	Type	Description
Checkout_ID[PK]	varchar(10)	Contains the sponsored products
Item code[FK]	varchar(10)	Primary key, Foreign key
Quantity	smallint(3)	Foreign key

3. Database implementation

Filters

Containing the word:

	Table	Action	Rows	Type	Collation	Size	Overhead
☐	checkout	Browse Structure Search Insert Empty Drop	10	InnoDB	latin1_swedish_ci	80.0 KiB	-
☐	customer	Browse Structure Search Insert Empty Drop	21	InnoDB	latin1_swedish_ci	16.0 KiB	-
☐	customer_address	Browse Structure Search Insert Empty Drop	21	InnoDB	latin1_swedish_ci	32.0 KiB	-
☐	delivery	Browse Structure Search Insert Empty Drop	10	InnoDB	latin1_swedish_ci	32.0 KiB	-
☐	order_summary	Browse Structure Search Insert Empty Drop	10	InnoDB	latin1_swedish_ci	32.0 KiB	-
☐	payment	Browse Structure Search Insert Empty Drop	10	InnoDB	latin1_swedish_ci	32.0 KiB	-
☐	product	Browse Structure Search Insert Empty Drop	10	InnoDB	latin1_swedish_ci	16.0 KiB	-
☐	sponsored	Browse Structure Search Insert Empty Drop	10	InnoDB	latin1_swedish_ci	32.0 KiB	-
☐	trolley	Browse Structure Search Insert Empty Drop	10	InnoDB	latin1_swedish_ci	32.0 KiB	-
	9 tables	Sum	112	InnoDB	utf8mb4_general_ci	304.0 KiB	0 B

Run SQL query/queries on database malakas:

```
CREATE TABLE customer (
  Email varchar(319) NOT NULL,
  Verification_code varchar(6) NOT NULL,
  Title ENUM('Mr','Ms','Mrs','Dr') NOT NULL,
  First_name varchar(30) NOT NULL,
  Last_name varchar(50) NOT NULL,
  Password varchar(250) NOT NULL,
  Confirm_password varchar(250) NOT NULL,
  Terms_and_conditions enum('yes','no') NOT NULL,
  Nectar_card_number varchar(19) NOT NULL,
  Communication_preferences tinyint(5) NOT NULL,
  Yes_I_want_to_be_contacted enum('yes','no') NOT NULL,
  Enter_phone_number varchar(20) NOT NULL,
  Country_code varchar(3) NOT NULL,
  Yes_make_my_experience_more_personal_by_using_my_date_of_birth enum('yes','no') NOT NULL,
  Customer_ID varchar(10) NOT NULL

)


ENGINE = INNODB DEFAULT CHARSET = latin1 COMMENT = 'This table contains the "Customer" data';


INSERT INTO customer (Email, Verification_code, Title, First_name, Last_name, Password, Confirm_password, Terms_and_conditions, Nectar_card_number, Communication_preferences, Yes_I_want_to_be_contacted, Enter_phone_number, Country_code, Yes_make_my_experience_more_personal_by_using_my_date_of_birth,
  Customer_ID) VALUES
('thanasilfirst@gmail.com', 123456, 'Mr', 'Athanasios', 'Ioannidis', 'Thanasis', 'Thanasis', 'yes', 123456789123456789, 123, 'yes', 6907863280, +30, 'yes', 0000000001),
('thanasissecond@gmail.com', 456789, 'Ms', 'Achilles', 'Aetos', '123456', '123456', 'no', 145328756985201674Z, 123, 'no', 6978541254, +31, 'yes', 0000000002),
('thanasisthird@gmail.com', 789123, 'Mrs', 'Onesimos', 'Barce', '123456789', '123456789', 'yes', 01787452369312145623, 123, 'no', 6912548564, +30, 'yes', 0000000003),
('thanasisfourth@gmail.com', 123147, 'Ms', 'Aeneas', 'Boures', '12345', '12345', 'no', 79658325214623154029, 123, 'yes', 6915426547, +55, 'no', 0000000004),
('thanasisfifth@gmail.com', 123258, 'Ms', 'Lykourgos', 'Chronis', 'Qwerty', 'Qwerty', 'yes', 12541235896547852I, 123, 'no', 6912543184, +30, 'yes', 0000000005),
('thanasissixth@gmail.com', 123369, 'Mrs', 'Agafya', 'Diamandis', 'password', 'password', 'no', 17283965425871452O3, 123, 'yes', 1425478520, +44, 'yes', 0000000006),
('thanasisseventh@gmail.com', 456147, 'Mr', 'Agamemnon', 'Eliades', '12345678', '12345678', 'yes', 12546965214587553O, 123, 'yes', 1452369854, +30, 'no', 0000000007),
('thanasiseight@gmail.com', 456258, 'Mr', 'Minta', 'Fotos', '111111', '111111', 'no', 78965412532658527, 123, 'no', 1425369874, +30, 'yes', 0000000021),
('thanasisninth@gmail.com', 456369, 'Mrs', 'Agata', 'Georgiades', '123123', '123123', 'yes', 96585214254876235G2, 123, 'yes', 1253254125, +30, 'yes', 0000000009),
('thanasistenth@gmail.com', 789147, 'Mr', 'Agatha', 'Hasapis', '1234567890', '1234567890', 'no', 96587412520189585489, 123, 'yes', 1478523698, +44, 'yes', 0000000010),
('thanasiseleventh@gmail.com', 789258, 'Dr', 'Agda', 'Iraklidis', '1234567', '1234567', 'yes', 12458526258754956O, 123, 'no', 1235269524, +30, 'no', 0000000012),
('thanasistwelve@gmail.com', 789369, 'Mr', 'Aggie', 'Kouris', 'qwerty123', 'qwerty123', 'no', 14142525365685967A5, 123, 'yes', 7896584125, +44, 'yes', 0000000011),
('thanasisthirtheen@gmail.com', 147789, 'Mrs', 'Agnes', 'Laventis', '000000', '000000', 'yes', 14785254125698563Z5, 123, 'no', 1254123698, +48, 'yes', 0000000012),
('thanasisfourteen@gmail.com', 147456, 'Ms', 'Elmi', 'Hendrapillas', 'lq2o3e', 'lq2o3e', 'no', 74125623589632147B5, 123, 'yes', 6745214965, +30, 'no', 0000000013),
('thanasisfifteen@gmail.com', 147123, 'Mr', 'Gregorios', 'Nephus', 'aa12345678', 'aa12345678', 'yes', 82314050087091106S8, 123, 'yes', 1203594786, +30, 'yes', 0000000014),
('thanasissixteen@gmail.com', 258789, 'Dr', 'Ianthe', 'Othonos', 'abc123', 'abc123', 'yes', 15357595848620248I0, 123, 'yes', 1254083679, +30, 'yes', 0000000015),
('thanasisseventeen@gmail.com', 258456, 'Mr', 'Kalypso', 'Papatonis', 'password1', 'password1', 'no', 81020342152659B595, 123, 'yes', 6352463127, +44, 'yes', 0000000016),
('thanasiseighteen@gmail.com', 258123, 'Mrs', 'Leto', 'Rellakis', '1234', '1234', 'yes', 15489582037731959975, 123, 'yes', 2536236415, +55, 'yes', 0000000017),
('thanasisnineteen@gmail.com', 369789, 'Mr', 'Nereus', 'Sotiropoulos', '123321', '123321', 'yes', 45214587456325698B54, 123, 'no', 3654128870, +55, 'no', 0000000018),
('thanasistwenty@gmail.com', 369456, 'Dr', 'Parthenope', 'Tsaousis', 'password123', 'password123', 'yes', 15452515859795B2814, 123, 'yes', 1458742369, +30, 'yes', 0000000019),
('thanasistwentyone@gmail.com', 369123, 'Ms', 'Pyrros', 'Vouvali', 'Babis', 'Babis', 'no', 48589632145236985A1, 123, 'yes', 8964281348, +55, 'no', 0000000020);


ALTER TABLE customer
ADD PRIMARY KEY (Customer_ID);
```

Run SQL query/queries on database malakas:

```sql
CREATE TABLE Customer_address(
    Address_nickname varchar(30) NOT NULL,
    Postcode varchar(7) NOT NULL,
    Select_your_address Enum ('13 abbey road', '20 High Street', '55 Station Road', '8 Main Street') NOT NULL,
    Building_name varchar(30) NOT NULL,
    Building_number smallint(4) NOT NULL,
    Flat_number smallint(4),
    Street varchar(40) NOT NULL,
    Town_or_City varchar(50) NOT NULL,
    County varchar(50) NOT NULL,
    Address_line_1 varchar(50) NOT NULL,
    Address_line_2 varchar(50) NOT NULL,
    Customer_ID varchar(10) NOT NULL


)


ENGINE = INNODB DEFAULT CHARSET = latin1 COMMENT = 'This table contains the "Customer" data. Also, Select_your_address will
contain all the addresses for the spesific postcode entered by the user now there are some example addresses added';


INSERT INTO Customer_address (Address_nickname, Postcode, Select_your_address, Building_name, Building_number, Flat_number, Street, Town_or_City, County, Address_line_1, Address_line_2, Customer_ID) VALUES
('Home', 'CB58HH', '13 abbey road', '', 13, NULL, 'abbey road', 'cambridge', 'cambridgeshire', '13 abbey road', '', 0000000001),
('Home1', 'CB18GB', '20 High Street', '', 20, 9, 'High Street', 'cambridge', 'cambridgeshire', '20 High Street', '', 0000000002),
('Home2', 'CB28FH', '55 Station Road', '', 55, 20, 'Station Road', 'cambridge', 'cambridgeshire', '55 Station Road', '', 0000000003),
('Home3', 'CB38SQ', '20 High Street', '', 20, 50, 'High Street', 'cambridge', 'cambridgeshire', '20 High Street', '', 0000000004),
('Home4', 'CB483R', '13 abbey road', '', 13, 4, 'abbey road', 'cambridge', 'cambridgeshire', '13 abbey road', '', 0000000005),
('Home5', 'CB585U', '20 High Street', '', 20, 6, 'High Street', 'cambridge', 'cambridgeshire', '20 High Street', '', 0000000006),
('Home6', 'CB68DD', '55 Station Road', '', 55, 13, 'Station Road', 'cambridge', 'cambridgeshire', '55 Station Road', '', 0000000007),
('Home7', 'CB78HY', '8 Main Street', '', 8, NULL, 'Main Street', 'Wentworth', 'Wentworth', '8 Main Street', '', 0000000008),
('Home8', 'CB63JF', '13 abbey road', '', 13, 12, 'abbey road', 'cambridge', 'cambridgeshire', '13 abbey road', '', 0000000009),
('Home9', 'CB5ER', '20 High Street', '', 20, 32, 'High Street', 'cambridge', 'cambridgeshire', '20 High Street', '', 0000000010),
('Home10', 'CB48HF', '13 abbey road', '', 13, 125, 'abbey road', 'cambridge', 'cambridgeshire', '13 abbey road', '', 0000000011),
('Home11', 'CB18JT', '55 Station Road', '', 55, 64, 'Station Road', 'cambridge', 'cambridgeshire', '55 Station Road', '', 0000000012),
('Home12', 'CB2BUN', '20 High Street', '', 20, 45, 'High Street', 'cambridge', 'cambridgeshire', '20 High Street', '', 0000000013),
('Home13', 'CB18JN', '13 abbey road', '', 13, 44 , 'abbey road', 'cambridge', 'cambridgeshire', '13 abbey road', '', 0000000014),
('Home14', 'CB2BMC', '20 High Street', '', 20, 42, 'High Street', 'cambridge', 'cambridgeshire', '20 High Street', '', 0000000015),
('Home15', 'CB3BXX', '13 abbey road', '', 13, 110, 'abbey road', 'cambridge', 'cambridgeshire', '13 abbey road', '', 0000000016),
('Home16', 'CB48HR', '8 Main Street', '', 8, NULL, 'Main Street', 'Wentworth', 'Wentworth', '8 Main Street', '', 0000000017),
('Home17', 'CB68QZ', '20 High Street', '', 20, 85, 'High Street', 'cambridge', 'cambridgeshire', '20 High Street', '', 0000000018),
('Home18', 'CB48HR', '8 Main Street', '', 8, NULL, 'Main Street', 'Wentworth', 'Wentworth', '8 Main Street', '', 0000000019),
('Home19', 'CB383T', '55 Station Road', '', 55, 60, 'Station Road', 'cambridge', 'cambridgeshire', '55 Station Road', '', 0000000020),
('Home20', 'CB48HR', '8 Main Street', '', 8, NULL, 'Main Street', 'Wentworth', 'Wentworth', '8 Main Street', '', 0000000021);

ALTER TABLE Customer_address
ADD PRIMARY KEY (Customer_ID),
ADD FOREIGN KEY (Customer_ID) REFERENCES customer(Customer_ID);
```

```sql
CREATE TABLE product(
    Product_title varchar(80) NOT NULL,
    Product_price decimal(10,2) unsigned NOT NULL,
    Price_per_ml decimal(10,2) unsigned ,
    Description varchar(1000) NOT NULL,
    Ingredients varchar(1000),
    Preparation varchar(1000) NOT NULL,
    Country_of_origin varchar(56) NOT NULL,
    Packaging varchar(100) NOT NULL,
    Ratings_summary decimal(10,2) unsigned NOT NULL,
    Item_code varchar(10) NOT NULL,
    Reviews varchar(1000) NOT NULL,
    Product_properties varchar(1000) NOT NULL,
    Offers varchar(1000),
    Net_content int(10) NOT NULL,
    Product_information varchar(1000) NOT NULL,
    Return_to varchar(1000) NOT NULL,
    warnings varchar(1000),
    Safety_information varchar(1000),
    Product_estimated_expiry varchar(10) NOT NULL,
    Price_history varchar(500) NOT NULL
)

ENGINE = INNODB DEFAULT CHARSET = latin1 COMMENT = 'This table contains the "product" data';


INSERT INTO product (Product_title, Product_price, Price_per_ml, Description, Ingredients, Preparation, Country_of_origin, Packaging, Ratings_summary, Item_code, Reviews, Product_properties, Offers, Net_content, Product_information, Return_to, warnings, Safety_information, Product_estimated_expiry,
Price_history)VALUES
('head and shoulders', 4.75, 1.25, 'Head & Shoulders Classic Clean 2 In 1 Shampoo 400Ml', 'Aqua, Sodium Laureth Sulfate, Sodium Lauryl Sulfate...', 'For best results, use with H&S conditioner that deeply moisturises hair and scalp', 'France', 'Bottle', 4.40, 0000000001, 'Great for eczema', '', '3 for £10', 400, 'Nti dandruff Shampoo targets the root cause of dandruff', 'procter & gamble uk, weybridge, surrey kt13 0xp, uk', 'Avoid contact with eyes', 'If contact occurs, rinse thoroughly with water', '2025-2-5', '4, 4.20, 4.75'),
('chocolate', 7.30, 1.60, 'fine chocolate (either cold or hot)', 'milk, chocholate powder', 'Remove the plastic bag and pour into water and wait 2 minutes', 'Greece', 'paper box', 3.40, 0000000002, 'easy to make', '', '4 for 20£', 200, 'Fast to make and great taste', 'procter & gamble uk, weybridge,
surrey kt13 0xp, uk', 'Avoid contact with eyes', 'If contact occurs, rinse thoroughly with water', '2024-3-4', '7.00, 6.20, 4.75'),
('toothbrush', 3, NULL, 'Medium strenght suggested from most experts', '', 'remove from packaging and wash', 'Germany', 'cardboard box', 4.15, 0000000003, 'cleans easily', '', '2 for £5', 1, 'Can clean even the hardest spots', 'procter & gamble uk, weybridge, surrey kt13 0xp, uk', '', '', '2030-2-5',
'1, 2.20, 2.75'),
('shaver', 2.45, NULL, 'With adaptable head that helps to not leave any marks', 'shaver, 3 heads', 'remove from box and install a head', 'UK', 'plastic box', 5.00, 0000000004, 'Skin never felt so fresh', 'Adaptable head', '3 for £6', 1, 'Cuts all the hair', 'procter & gamble uk, weybridge, surrey kt13
0xp, uk', 'Dont put pressure when shaving', 'if cut occurs disenfect the injure', '2030-7-4', '1, 1.80, 2.00'),
('hair dryer', 29.99, NULL, 'has 3 different speeds and 2 heads', 'hair dryer, 3 heads', 'remove from box add a head an plug it in', 'Spain', 'cardboard box', 4.10, 0000000005, 'does not make a lot of sound', 'can change heads', '', 1, 'Fast hair dry', 'procter & gamble uk, weybridge, surrey kt13 0xp,
uk', 'dont keep turned on over 10 minutes', 'If overheating occurs, call the firemen', '2040-9-18', '25.00, 19.99, 19.99'),
('toilet brush', 9.89, NULL, 'high quality and dryies fast', '', 'remove from box and screw the handle', 'UK', 'plastic box', 3.90, 0000000006, 'very durable', 'fast dry', '2 for £18', 1, 'brush to clean the toilet', 'procter & gamble uk, weybridge, surrey kt13 0xp, uk', '', '', '2030-3-12', '5, 5.80,
6.44'),
('toilet paper', 3.80, NULL, '3 rows of paper ', '', 'remove from packaging and remove the first paper in each roll', 'France', 'plastic ceiling', 4.80, 0000000007, 'Worth for the money', 'fragrance added', '3 for £8', 6, 'has good smell and has the best price', 'procter & gamble uk, weybridge, surrey
kt13 0xp, uk', '', '', '2024-11-29', '4, 2.30, 1.25'),
('gums', 2.30, NULL, 'mint flavour long lasting mint breath', 'Gum Base, Glycerol, Natural And Artificial Flavors, Hydrogenated Starch Hydrolysate', 'remove sefety pin', 'Greece', 'plastic Bottle', 3.40, 0000000008, 'mint breath', '', '3 for £3', 20, 'provides good breath and cleans teeth', 'procter &
gamble uk, weybridge, surrey kt13 0xp, uk', 'do not swallow', 'if you swallow contact your GP', '2023-1-18', '2, 2.20, 2.75'),
('keyboard', 24.99, NULL, 'membran keyboard, ideal for offices', '', 'remove from packaging and plug into computer', 'Germany', 'cardboard box', 4.80, 0000000009, 'very reliable', 'silent', '', 1, 'very good for general use', 'procter & gamble uk, weybridge, surrey kt13 0xp, uk', '', '', '2030-6-30',
'22.99, 19.99 15.00'),
('christmas balls', 18.00, NULL, '6 christmas balls with preinstalled ropes', '', 'remove from box', 'Greece', 'Plastic box', 4.90, 0000000010, 'Great for the christmas tree', '', '3 for £50', 6, 'Great for christmas tree', 'procter & gamble uk, weybridge, surrey kt13 0xp, uk', 'dont brake the balls',
'If a ball breaks clean the floor very good', '2025-2-5', '17.99, 16.99, 16.00');

ALTER TABLE product
ADD PRIMARY KEY (Item_code);
```

Run SQL query/queries on database malakas:

```sql
CREATE TABLE sponsored(
    Sponsored_product varchar(700) NOT NULL,
    Item_code varchar(100) NOT NULL,
    Trolley_ID varchar(100) NOT NULL
)


ENGINE = INNODB DEFAULT CHARSET = latin1 COMMENT = 'This table contains the "sponsored" data';


INSERT INTO sponsored (Sponsored_product, Item_code, Trolley_ID)VALUES
('keyboard', 0000000001, 0000000001),
('chocolate', 0000000002, 0000000002),
('mouse', 0000000003, 0000000003),
('flower', 0000000004, 0000000004),
('eggs', 0000000005, 0000000005),
('sausage', 0000000006, 0000000006),
('milk', 0000000007, 0000000007),
('fruit juice', 0000000008, 0000000008),
('apples', 0000000009, 0000000009),
('plastic bags', 0000000010, 0000000010);


ALTER TABLE sponsored
ADD PRIMARY KEY (Item_code),
ADD FOREIGN KEY (Item_code) REFERENCES product(Item_code),
ADD FOREIGN KEY (Trolley_ID) REFERENCES trolley(Trolley_ID);

```

Run SQL query/queries on database malakas:

```sql
CREATE TABLE trolley(
    Trolley_total decimal(8,2) unsigned NOT NULL,
    Including_savings decimal(8,2) unsigned NOT NULL,
    Minimum_trolley_charge Tinyint(5) NOT NULL,
    Allow_substitutions enum('yes', 'no') NOT NULL,
    Substitution_preferences varchar(100),
    Item_code varchar(10) NOT NULL,
    Trolley_ID varchar(10) NOT NULL
)


ENGINE = INNODB DEFAULT CHARSET = latin1 COMMENT = 'This table contains the "trolley" data';


INSERT INTO trolley (Trolley_total, Including_savings, Minimum_trolley_charge, Allow_substitutions, Substitution_preferences, Item_code, Trolley_ID) VALUES
(50.25, 49.23, 20, 'yes', 'if there is no milk replace it with oat milk',0000000001, 0000000001),
(434.25, 399.67, 20, 'no', '',0000000002, 0000000002),
(132.22, 128.45, 20, 'yes', 'if there is no keyboard replace it with nothing',0000000003, 0000000003),
(40.00, 40.00, 20, 'no', '',0000000004, 0000000004),
(78.87, 76.15, 20, 'no', '',0000000005, 0000000005),
(64.34, 60.35, 20, 'yes', 'if there is no gums replace it with breath fresher',0000000006, 0000000006),
(143.01, 137.48, 20, 'yes', 'if there is no toilet paper replace it with kitchen paper',0000000007, 0000000007),
(76.23, 71.78, 20, 'no', '',0000000008, 0000000008),
(98.46, 94.69, 20, 'yes', 'if there is no head and shoulders replace it with classic shampoo',0000000009, 0000000009),
(89.25, 84.46, 20, 'yes', 'if there is no chocolate replace it with vanilla',0000000010, 0000000010);

ALTER TABLE trolley
ADD PRIMARY KEY (Trolley_ID),
ADD FOREIGN KEY (Item_code) REFERENCES product(Item_code);

```

Run SQL query/queries on database malakas:

```sql
CREATE TABLE checkout(
    Disclaimer varchar(200) NOT NULL,
    Where_did_you_hear_about_us varchar(200) NOT NULL,
    I_am_over_18_years_old Enum('yes', 'no') NOT NULL,
    Feedback_competition varchar(200) NOT NULL,
    Payment_ID varchar(10) NOT NULL,
    Delivery_ID varchar(10) NOT NULL,
    Customer_ID varchar(10) NOT NULL,
    Trolley_ID varchar(10) NOT NULL,
    Checkout_ID varchar(10) NOT NULL

)


ENGINE = INNODB DEFAULT CHARSET = latin1 COMMENT = 'This table contains the "checkout" data';
INSERT INTO checkout( Disclaimer, Where_did_you_hear_about_us, I_am_over_18_years_old, Feedback_competition, Payment_ID, Delivery_ID, Customer_ID, Trolley_ID, Checkout_ID)VALUES
('Any information contained should not be construed to be a substitute for legal counsel on any subject matter.', 'Television', 'no', 'i would like to see less ads', 0000000001, 0000000001, 0000000016, 0000000001, 0000000001),
('Any information contained should not be construed to be a substitute for legal counsel on any subject matter.', 'Google ads', 'yes', 'I would like to see more relevant ads',0000000002, 0000000002, 0000000002, 0000000002, 0000000002),
('Any information contained should not be construed to be a substitute for legal counsel on any subject matter.', 'radio', 'yes', 'Smaller minimum checkout price',0000000003, 0000000003, 0000000003, 0000000003, 0000000003),
('Any information contained should not be construed to be a substitute for legal counsel on any subject matter.', 'posters', 'no', 'login shouldnt be mamdatory to oder things', 0000000004, 0000000004, 0000000004, 0000000004, 0000000004),
('Any information contained should not be construed to be a substitute for legal counsel on any subject matter.', 'Friends', 'no', 'there were a lot of unnecesairy categories', 0000000005, 0000000005, 0000000005, 0000000005, 0000000005),
('Any information contained should not be construed to be a substitute for legal counsel on any subject matter.', 'google ads', 'no', 'It would be greate if there was a dark mode', 0000000006, 0000000006, 0000000006, 0000000006, 0000000006),
('Any information contained should not be construed to be a substitute for legal counsel on any subject matter.', 'Television', 'yes', 'Prices could be lower compaired to other supermarkets',0000000007, 0000000007, 0000000007, 0000000007, 0000000007),
('Any information contained should not be construed to be a substitute for legal counsel on any subject matter.', 'TikTok', 'no', 'It was hard to book a delivery slot', 0000000008, 0000000008, 0000000008, 0000000008, 0000000008),
('Any information contained should not be construed to be a substitute for legal counsel on any subject matter.', 'radio', 'yes', 'The chekout could be much simpler', 0000000009, 0000000009, 0000000009, 0000000009, 0000000009),
('Any information contained should not be construed to be a substitute for legal counsel on any subject matter.', 'friends', 'yes', 'I dont have anything specific to add', 0000000010, 0000000010, 0000000010, 0000000010, 0000000010);



ALTER TABLE checkout
ADD PRIMARY KEY (Checkout_ID),
ADD FOREIGN KEY (Trolley_ID) REFERENCES trolley(Trolley_ID),
ADD FOREIGN KEY (Customer_ID) REFERENCES customer(Customer_ID),
ADD FOREIGN KEY (Delivery_ID) REFERENCES delivery(Delivery_ID),
ADD FOREIGN KEY (Payment_ID) REFERENCES payment(Payment_ID);

```

Run SQL query/queries on database malakas:

```sql
CREATE TABLE payment(
    Name_on_card varchar(90) NOT NULL,
    Card_number SMALLINT(16) NOT NULL,
    Expires_number varchar(10) NOT NULL,
    Card_security_code SMALLINT(3) NOT NULL,
    Non_UK_billing_address enum('yes', 'no') NOT NULL,
    Save_card_for_future_transaction enum('yes', 'no') NOT NULL,
    Join_clubcard enum('yes', 'no') NOT NULL,
    Choose_a_billing_address varchar(50) NOT NULL,
    Payment_ID varchar(10) NOT NULL,
    Customer_ID varchar(10) NOT NULL
)


ENGINE = INNODB DEFAULT CHARSET = latin1 COMMENT = 'This table contains the "payment" data';


INSERT INTO payment (Name_on_card, Card_number, Expires_number, Card_security_code, Non_UK_billing_address, Save_card_for_future_transaction, Join_clubcard, Choose_a_billing_address, Payment_ID, Customer_ID) VALUES
('Athanasios Ioannidis', 0000000000000000, '2029-6-3', 564, 'no', 'no', 'yes', '13 abbey road', 0000000001, 0000000006),
('Achilles Aetos', 0000000000000000, '2022-12-2', 124, 'yes', 'yes', 'no', '370 Green Lane', 0000000002, 0000000002),
('Onesimos Baros', 0000000000000000, '2023-11-15', 434, 'no', 'no', 'yes', '37 Kings Road', 0000000003, 0000000003),
('Aeneas Bouras', 0000000000000000, '2024-3-12', 023, 'no', 'yes', 'no', '20 High Street', 0000000004, 0000000004),
('Babis tourlakis', 0000000000000000, '2025-4-27', 753, 'yes', 'yes', 'yes', '9 Mill Road', 0000000005, 0000000005),
('Tommy Shelby', 0000000000000000, '2026-7-23', 357, 'no', 'yes', 'no', '55 Station Road', 0000000006, 0000000006),
('Agnes Mandrapilias', 0000000000000000, '2027-9-14', 159, 'no', 'yes', 'no', '14 Station Road', 0000000007, 0000000007),
('constantia Tsami', 0000000000000000, '2028-2-19', 452, 'yes', 'yes', 'yes', '82 Grove Road', 0000000008, 0000000008),
('Dorina Androulaki', 0000000000000000, '2023-1-4', 532, 'yes', 'no', 'yes', '8 Main Street', 0000000009, 0000000009),
('Maria Papadopoulou', 0000000000000000, '2023-5-7', 197, 'no', 'yes', 'no', '9107 Alexander Road', 0000000010, 0000000010);



ALTER TABLE payment
ADD PRIMARY KEY (Payment_ID),
ADD FOREIGN KEY (Customer_ID) REFERENCES customer(Customer_ID);


```

Run SQL query/queries on database malakas:

```
CREATE TABLE delivery(
    Delivery_information varchar(200) NOT NULL,
    Delivery_feedback varchar(200) NOT NULL,
    Delivery_address varchar(100) NOT NULL,
    Delivery_instructions varchar(200) NOT NULL,
    Pick_pack_and_delivery enum('yes', 'no') NOT NULL,
    Greener_grocery_delivery enum('yes', 'no') NOT NULL,
    Slot_type enum('normal', 'fast') NOT NULL,
    Is_someone_at_the_delivery_address_self_isolating enum('yes', 'no') NOT NULL,
    Checkout_ID varchar(10) NOT NULL,
    Delivery_ID varchar(10) NOT NULL
)


ENGINE = INNODB DEFAULT CHARSET = latin1 COMMENT = 'This table contains the "delivery" data';


INSERT INTO delivery (Delivery_information, Delivery_feedback, Delivery_address, Delivery_instructions, Pick_pack_and_delivery, Greener_grocery_delivery, Slot_type, Is_someone_at_the_delivery_address_self_isolating, Checkout_ID, Delivery_ID) VALUES
('Alcohol pricing & promotions for customers served from our Scottish & Welsh stores may differ','It was hard to book the slots', 'When you arrive call me', 'If user wants another delivery address he ads it here','no', 'no', 'fast', 'no', 0000000001, 0000000001),
('Alcohol pricing & promotions for customers served from our Scottish & Welsh stores may differ','It is very complicated to book a slot', 'dont hit the doorbell just leave it outside', 'If user wants another delivery address he ads it here','no', 'no', 'fast', 'no', 0000000002, 0000000002),
('Alcohol pricing & promotions for customers served from our Scottish & Welsh stores may differ','The experience was great', 'I would prefer if you ware a face mask', 'If user wants another delivery address he ads it here','no', 'no', 'fast', 'no', 0000000003, 0000000003),
('Alcohol pricing & promotions for customers served from our Scottish & Welsh stores may differ','The site keeps timing out', 'My house is behind co-op', 'If user wants another delivery address he ads it here','no', 'no', 'fast', 'no', 0000000004, 0000000004),
('Alcohol pricing & promotions for customers served from our Scottish & Welsh stores may differ','The delivery is expesive', 'Dont come inside the fence because there is a dog', 'If user wants another delivery address he ads it here','no', 'no', 'fast', 'no', 0000000005, 0000000005),
('Alcohol pricing & promotions for customers served from our Scottish & Welsh stores may differ','Everything was ok', 'Take care of the things because they are frigile', 'If user wants another delivery address he ads it here','no', 'no', 'fast', 'no', 0000000006, 0000000006),
('Alcohol pricing & promotions for customers served from our Scottish & Welsh stores may differ','There were a lot of steps', 'If the delivery driver is beautiful tell him to leave his number', 'If user wants another delivery address he ads it here','no', 'no', 'fast', 'no', 0000000007, 0000000007),
('Alcohol pricing & promotions for customers served from our Scottish & Welsh stores may differ','There should be more availability', 'Uhach out for the big step on the door', 'If user wants another delivery address he ads it here','no', 'no', 'fast', 'no', 0000000008, 0000000008),
('Alcohol pricing & promotions for customers served from our Scottish & Welsh stores may differ','I could not find a fast delivery', 'If it is raining leave the delivery under the roof', 'If user wants another delivery address he ads it here','no', 'no', 'fast', 'no', 0000000009, 0000000009),
('Alcohol pricing & promotions for customers served from our Scottish & Welsh stores may differ','delivery times outside my preferences', 'If I am not there leave it on the neighbour', 'If user wants another delivery address he ads it here','no', 'no', 'fast', 'no', 0000000010, 0000000010);


ALTER TABLE delivery
ADD PRIMARY KEY (Delivery_ID),
ADD FOREIGN KEY (Checkout_ID) REFERENCES checkout(Checkout_ID);
```

Run SQL query/queries on database malakas:

```
CREATE TABLE order_summary(
    Checkout_ID varchar(10) NOT NULL,
    Item_code varchar(10) NOT NULL,
    Quantity smallint(3) NOT NULL

)

ENGINE = INNODB DEFAULT CHARSET = latin1 COMMENT = 'This table contains the "trolley" data';


INSERT INTO order_summary(Checkout_ID, Item_code, Quantity)VALUES
(0000000001, 0000000001, 5),
(0000000002, 0000000002, 8),
(0000000003, 0000000003, 1),
(0000000004, 0000000004, 6),
(0000000005, 0000000005, 9),
(0000000006, 0000000006, 13),
(0000000007, 0000000007, 5),
(0000000008, 0000000008, 3),
(0000000009, 0000000009, 4),
(0000000010, 0000000010, 7);

ALTER TABLE order_summary
ADD PRIMARY KEY (Checkout_ID),
ADD FOREIGN KEY (Item_code) REFERENCES product(Item_code);
```

4. SQL Queries (50%)

4.1 Query 1

4.1.1 For what purpose will this query be used in business terms?

As a support employee from the company I want to search for a customer in the database to validate or change some of the customer's data. Additionally I want all the data to show in order so I can find the customer easier.

4.1.2 Query in natural language

I want the first name and last name in the list named customer and I also want them in ascending order.

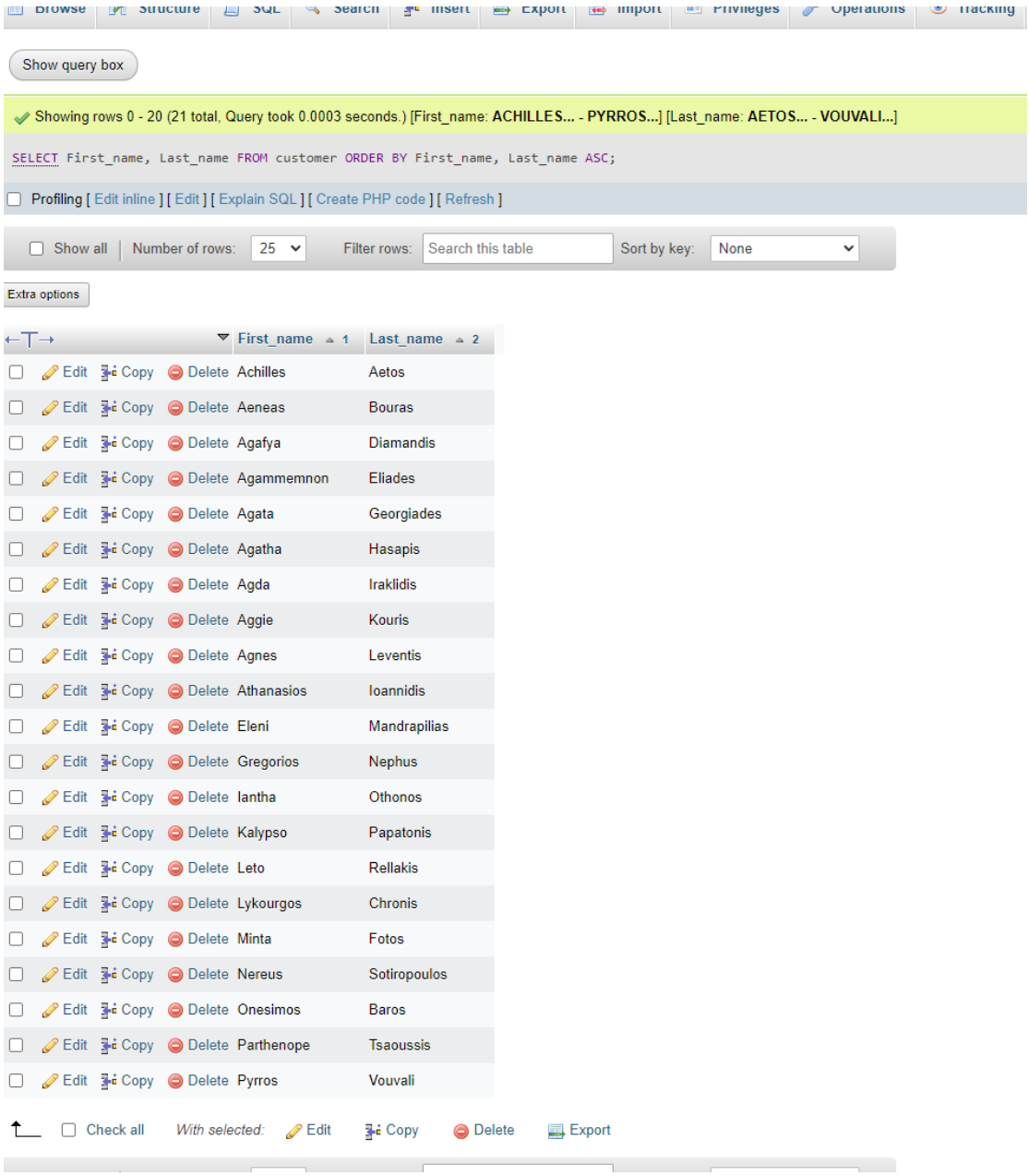
4.1.3 SQL Code and output

Input:

Run SQL query/queries on database customer:

```
1 SELECT First_name, Last_name
2 FROM customer
3 ORDER BY First_name, Last_name ASC;
```

Output:


Browse Structure SQL Search Insert Export Import Privileges Operations Tracking
Show query box
Showing rows 0 - 20 (21 total, Query took 0.0003 seconds.) [First_name: ACHILLES... - PYRROS...] [Last_name: AETOS... - VOUVALI...]
SELECT First_name, Last_name FROM customer ORDER BY First_name, Last_name ASC;
Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]
Show all | Number of rows: 25 Filter rows: Search this table Sort by key: None
Extra options
First_name 1 Last_name 2
Edit Copy Delete Achilles Aetos
Edit Copy Delete Aeneas Bouras
Edit Copy Delete Agafya Diamandis
Edit Copy Delete Agammemnon Eliades
Edit Copy Delete Agata Georgiades
Edit Copy Delete Agatha Hasapis
Edit Copy Delete Agda Iraklidis
Edit Copy Delete Aggie Kouris
Edit Copy Delete Agnes Leventis
Edit Copy Delete Athanasios Ioannidis
Edit Copy Delete Eleni Mandrapilias
Edit Copy Delete Gregorios Nephus
Edit Copy Delete Iantha Othonos
Edit Copy Delete Kalypso Papatonis
Edit Copy Delete Leto Rellakis
Edit Copy Delete Lykourgos Chronis
Edit Copy Delete Minta Fotos
Edit Copy Delete Nereus Sotiropoulos
Edit Copy Delete Onesimos Baros
Edit Copy Delete Parthenope Tsaoussis
Edit Copy Delete Pyrros Vouvali
Check all With selected: Edit Copy Delete Export

4.1.4 Explain the output of the data (was this what was predicted?)

The result is what was expected by the employee. After writing this SQL query he can now see all the names in order so he can find the user he wants to much easier.

4.2 Query 2

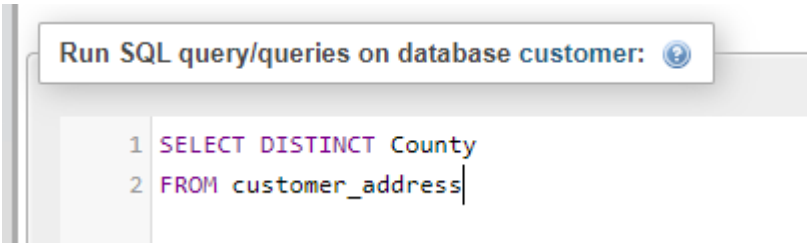
4.2.1 For what purpose will this query be used in business terms?

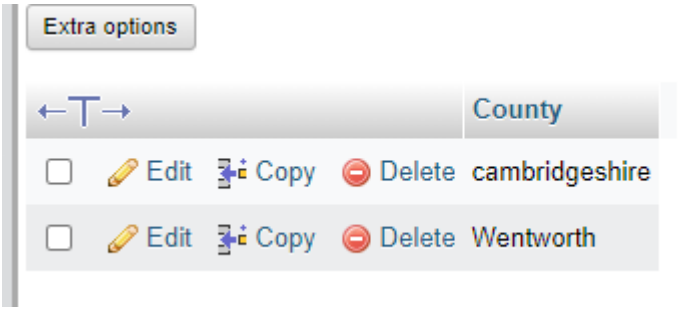
As a business analyst I want to check all the counties that the company has delivered and also check what the most popular ones are.

4.2.2 Query in natural language

The County attribute is selected from the list customer address (all the county's will be viewed.

4.2.3 SQL Code and output





4.2.4 Explain the output of the data (was this what was predicted?)

The output was as expected. Even though only two counties are inside the database and we can easily identify them in a much bigger database this SQL query would be very helpful.

4.3 Query 3

4.3.1 For what purpose will this query be used in business terms?

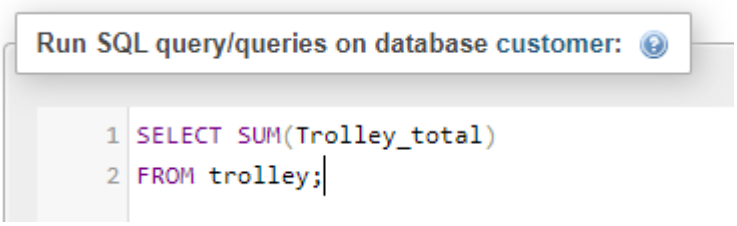
As a company accountant I want to check the earnings the company had until today so I can make the necessary calculations.

4.3.2 Query in natural language

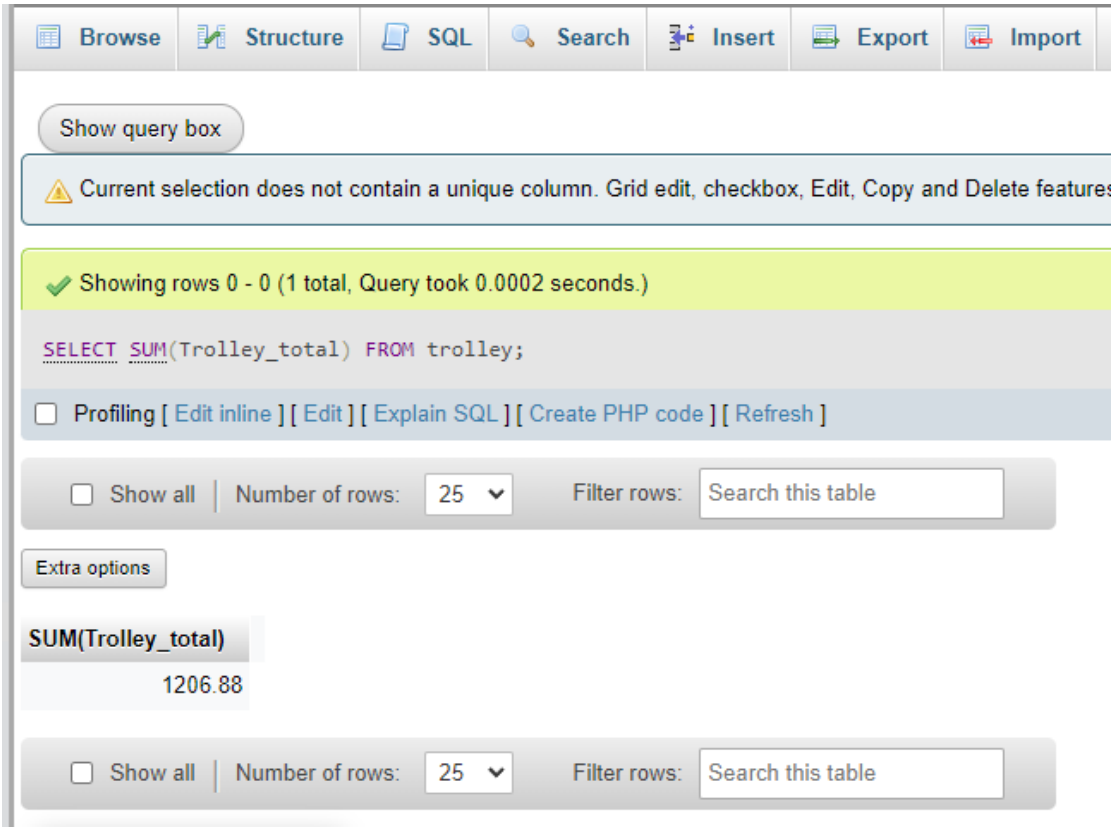
All the values that Trolley total from the list trolley contains are summed up and displayed.

4.3.3 SQL Code and output

Input:



Output:



4.3.4 Explain the output of the data (was this what was predicted?)

The outcome is what the company accountant was expecting. After this SQL query the company accountant can view the total amount that customers spent.

4.4 Query 4

4.4.1 For what purpose will this query be used in business terms?

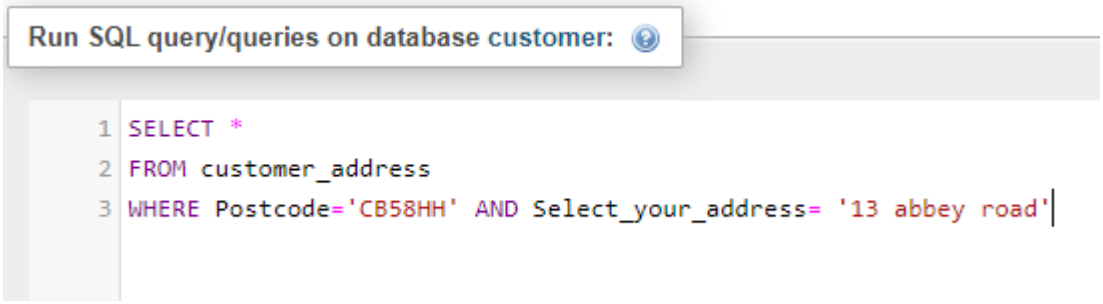
There was a problem with the delivery in the current address and it could not be delivered. The company support team has only the address of the customer but not the name. With this query they can find the customer id and therefore their name so they can include his name in the email they want to send about the delivery delay.

4.4.2 Query in natural language

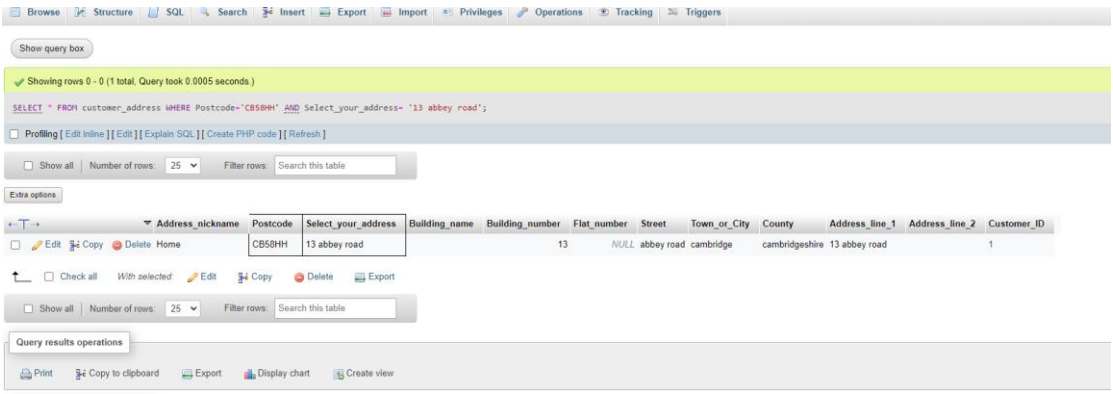
I to find from the customer address list the values 'CB58HH' and 13 abbey road from postcode and select your address, respectively.

4.4.3 SQL Code and output

Input:



Output:



4.4.4 Explain the output of the data (was this what was predicted?)]

The output was as predicted from the company support employee. The customer ID was found (1). The employee can also validate that he found the correct customer id because the database shows what values he searched for (circled by the SQL).

4.5 Query 5

4.5.1 For what purpose will this query be used in business terms?

A customer's payment is pending and never completes. Therefore the order cannot be delivered. Some banks require the delivery address to be the same as the billing address. In this case the company support employee will check if the billing address is the same as the delivery address.

4.5.2 Query in natural language

Firstly the lists that contain the attributes are named and collected by the SQL. Next the type of join table is defined (with the lists that will participate, also mentioned before). If the select your address attribute is the same as the billing address show it to the user.

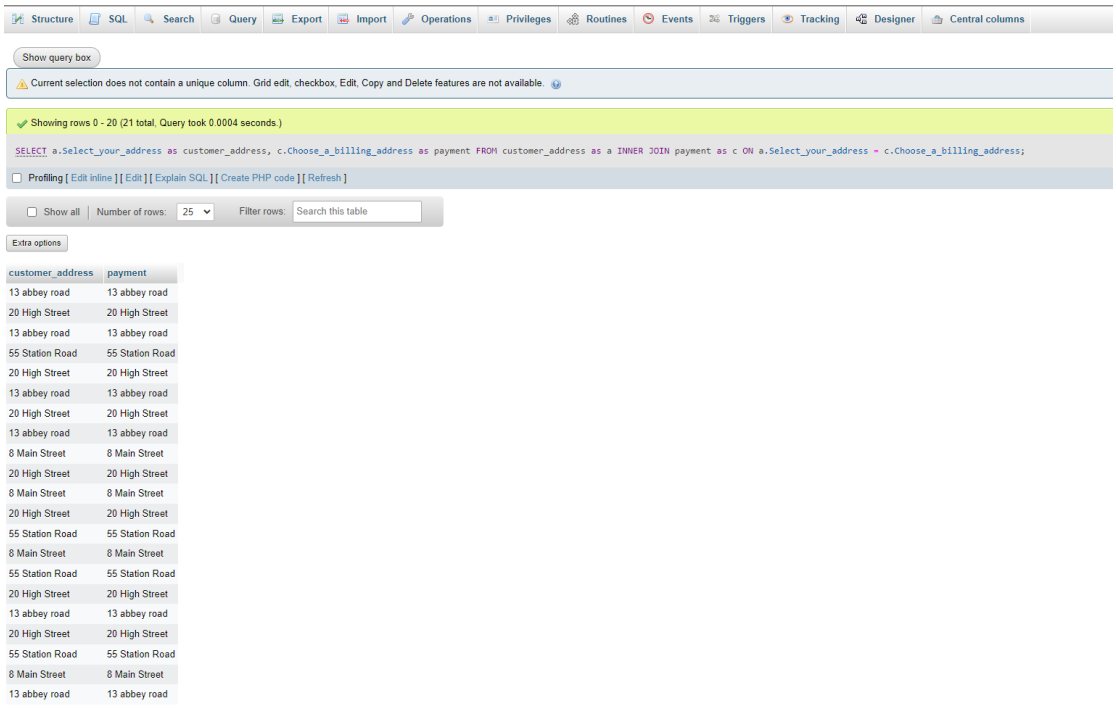
4.5.3 SQL Code and output

Input:

Run SQL query/queries on database customer:

```
1 SELECT a.Select_your_address as customer_address, c.Choose_a_billing_address as
2 payment
3 FROM customer_address as a
4 INNER JOIN payment as c
5 ON a.Select_your_address = c.Choose_a_billing_address ;
```

Output:



Structure | SQL | Search | Query | Export | Import | Operations | Privileges | Routines | Events | Triggers | Tracking | Designer | Central columns

Show query box

Current selection does not contain a unique column. Grid edit, checkbox, Edit, Copy and Delete features are not available.

Showing rows 0 - 20 (21 total, Query took 0.0004 seconds.)

```
SELECT a.Select_your_address as customer_address, c.Choose_a_billing_address as payment FROM customer_address as a INNER JOIN payment as c ON a.Select_your_address = c.Choose_a_billing_address;
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all | Number of rows: 25 | Filter rows: Search this table

Extra options

customer_address	payment
13 abbey road	13 abbey road
20 High Street	20 High Street
13 abbey road	13 abbey road
55 Station Road	55 Station Road
20 High Street	20 High Street
13 abbey road	13 abbey road
20 High Street	20 High Street
13 abbey road	13 abbey road
8 Main Street	8 Main Street
20 High Street	20 High Street
8 Main Street	8 Main Street
20 High Street	20 High Street
55 Station Road	55 Station Road
8 Main Street	8 Main Street
55 Station Road	55 Station Road
20 High Street	20 High Street
13 abbey road	13 abbey road
20 High Street	20 High Street
55 Station Road	55 Station Road
8 Main Street	8 Main Street
13 abbey road	13 abbey road

4.5.4 Explain the output of the data (was this what was predicted?)

The outcome was almost what was predicted. Ideally the employee would like to see only one set of attributes but this could be done by this SQL query. The employee now can see all the matching addresses with billing addresses.

5. References

Reference list

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