COS 221: PRACTICAL 5
DIONYSUS REPORT

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OVERVIEW:

As a team, Dionysus, we have set out to create a database and web application that has been implemented in order to allow for wine tourists and winery owners to sign-up and log-in as users in order to use our platform. Our intuitive and easy-to-use interface prioritises user-friendliness, offering a seamless experience and enhancing our aim to promote South Africa as a desirable wine tourism destination and facilitate cultural exchange, economic growth, and employment opportunities within the country's wine industry. This adds to bridging the advancing world of technology to wine tourism making this a desired and great change to the field.

GENERAL OVERVIEW AND EXPLANATION

Wine tourism is a form of tourism which explores the cultures and history behind wine (What is wine tourism and why is it so big?, 2023). With around 2690 licensed wineries(Vinpro, 2022), South Africa ranks 8th in the world among the top most wine-producing countries (Vinpro, 2022), making wine tourism popular, and thus, a great investment opportunity. With different types, brands, experiences and events, the wine tourism industry has a lot to offer (Jordan, 2019).

WINE TYPES OR CATEGORIES EXPLAINED

There are six main categories of wine, each with their own specific types defined by varying characteristics (Jordan, 2019). Reds, such as Cabernet Sauvignon, Merlot, Pinot Noir or Chanti, are characterised by their dark flavours and tannins. Whites, such as Chardonnay, Sauvignon Blanc or Pinot Grigio, are characterised by their light flavours. Rosé has two distinct characteristic groups, namely dry (Grenache, Caignan or Pinot Noir) and sweet (white merlot, pink moscato). Sparkling wines are carbonated (Champagne, Prosecco). Dessert wines are very sweet (Icewine, Moscato). Finally, Fortified wines have added spirits (Port, Sherry)(Jordan, 2019).

WINE POINTS AND PRICES

Wines are scored on a scale up to 100 (Not recommended to classic). Each wine has a score (Wine Spectator, 2017). Wine prices for the average consumer range from R50 – R210 for a bottle, but can also be priced higher, up to R7000, for more luxury bottles (Floris-Samuels, 2021). Prices are influenced by quality, reputation, scarcity, production costs, vintage and market factors. There are Entry-level (cheapest), Mid-range, Premium and Iconic wines (most expensive)(Outreville & Le Fur, 2017).

OTHER USEFUL INFORMATION FOR A WINE TOURIST

Wine tourists can partake in many different experiences such as wine tasting, wine tours, immersive wine making, grape or wine festivals, workshops, courses and gastronomic experiences (Vinpro, 2022). Often the history of a wine or winery may be of interest as well as the impact of different types of grapes, skins, vines, seeds, processes etc. Wine in South Africa is popular in Cape Town but notable South African farms include Groot Constantia, Stellenbosch Vineyards, Franschhoek Wine Valley, Meerlust Estate, Hamilton Russell Vineyards, Fairview and Kanonkop Estate (Wine Tourism Global, 2023).

REFERENCES

ECONOMIC VALUE OF WINE TOURISM. (2019). Retrieved from Vinpro: https://vinpro.co.za/wp-content/uploads/2020/07/Economic-Value-Wine-Tourism-2019-Infographic-Vinpro-Final.pdf

Floris-Samuels, B. (2021, May). *SA WINE INDUSTRY 2021 STATISTICS NR 46*. Retrieved from SAWIS: https://www.sawis.co.za/

Jordan, D. (2019, January 21). *Wine 101: What are the different types of wine ?* Retrieved from Corkbeard wine co: https://corkbeard.com/blogs/news/wine-101-what-are-the-different-types-of-wine

Outreville, J. F., & Le Fur, E. (2017). The price of wine as consumer good or investment plan: a survey of existing and missing hypotheses. *Conference: European Association of Wine Economists (EuAWE), 14th annual meeting*, (pp. 373-392). Bologna. Retrieved from https://www.researchgate.net/publication/330983645_The_price_of_wine_as_consumer_good_or_investment_plan_a_survey_of_existing_and_missing_hypotheses

Vinpro. (2022). *SA-WINE-TOURISM-VISITOR-RESEARCH-REPORT-2022*. Retrieved from vinpro: https://vinpro.co.za/wp-content/uploads/2022/09/SA-WINE-TOURISM-VISITOR-RESEARCH-REPORT-2022.pdf

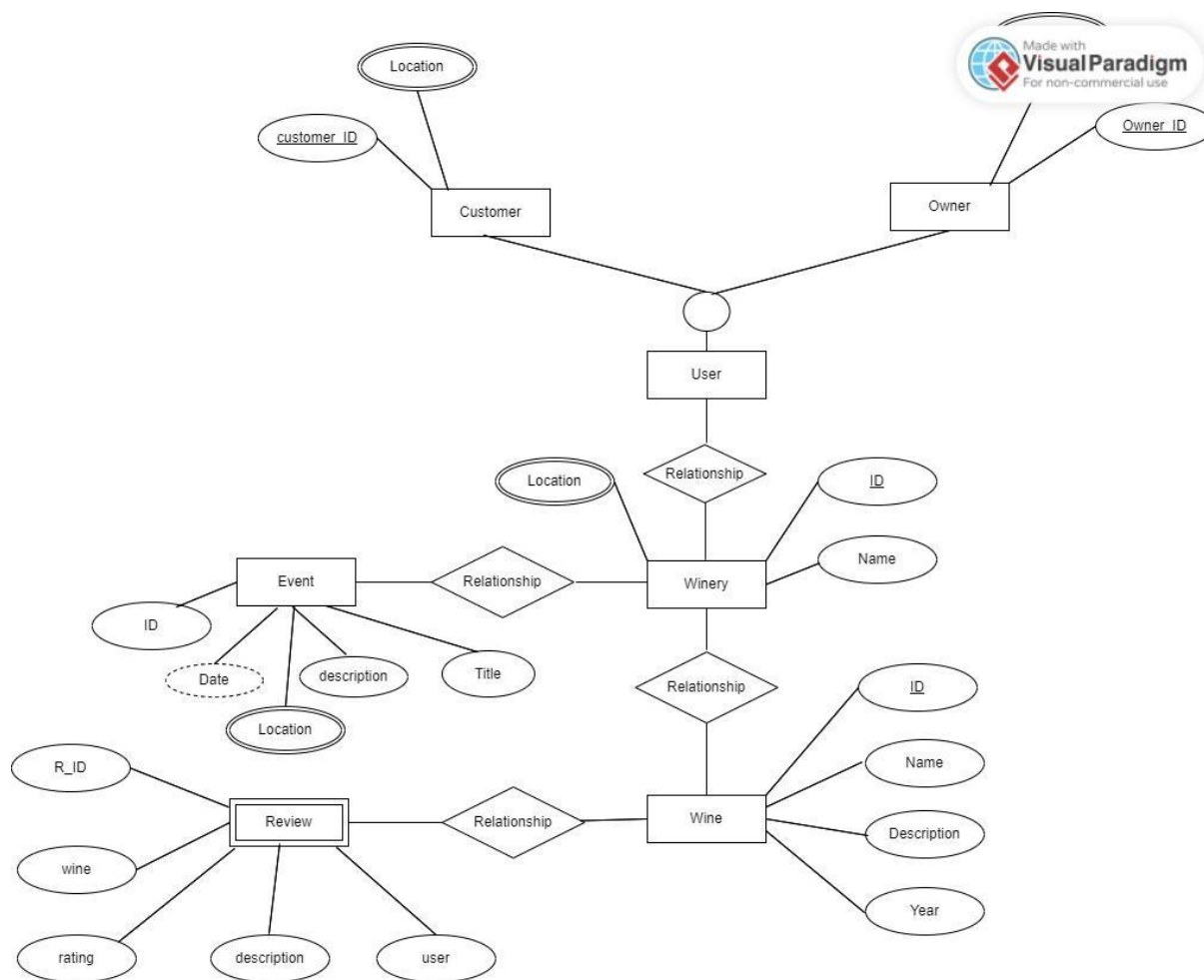*What is wine tourism and why is it so big?* (2023, January 27). Retrieved from Tourism Teacher: https://tourismteacher.com/wine-tourism/

Wine Spectator. (2017, August 9). *Scoring Scale*. Retrieved from Wine Spectator: https://www.winespectator.com/articles/scoring-scale

Wine Tourism Global. (2023). *Experiences in South Africa.* Retrieved from Wine Tourism: https://www.winetourism.com/search/?country=South%20Africa
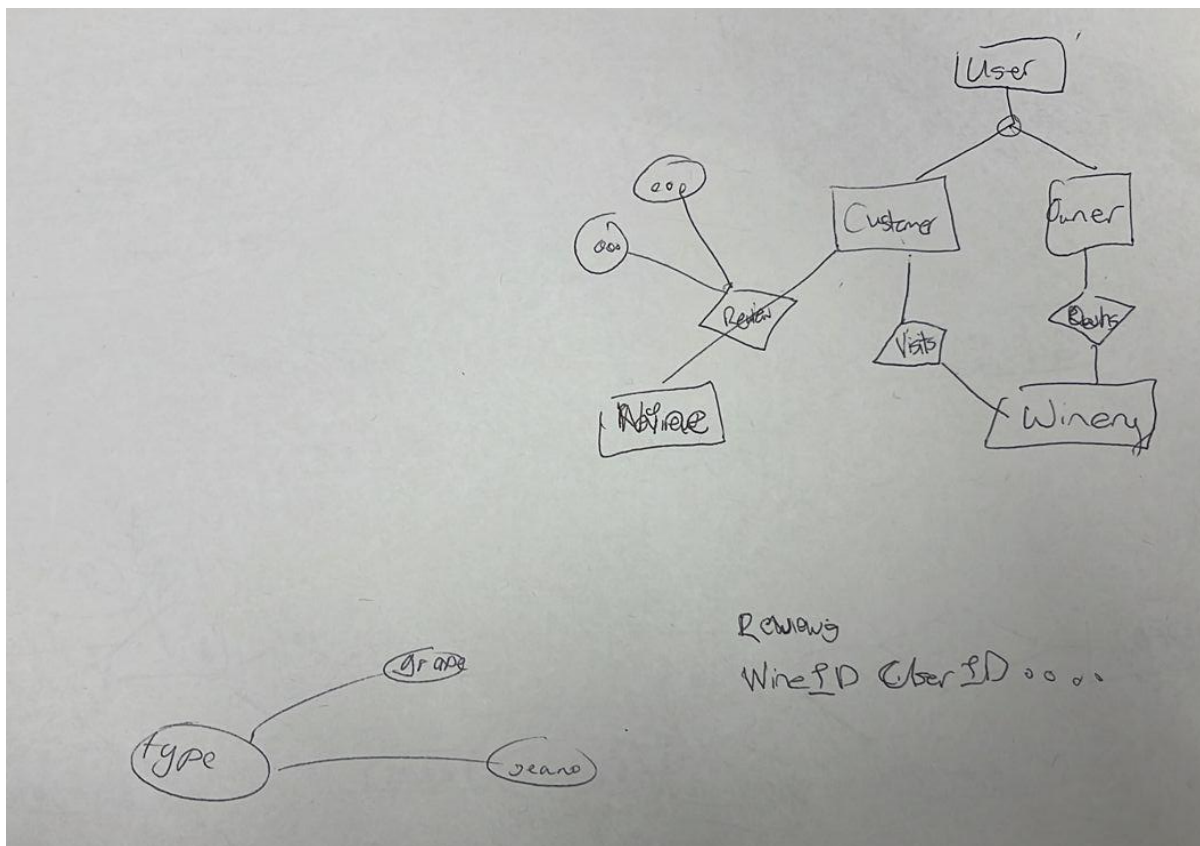
FIRST DRAFT

This was a "feeling out" process of sorts. A basic (or rough draft) ER diagram was sketched based on the research conducted as part of task one. Most of the attributes and relationships were incomplete. This was due to uncertainty regarding the mapping of relationships and attributes to the appropriate entities.


The pencil sketch below relates to the User entity. It was established that a specialisation of User will consist of Owner entity (winery owner) and Customer entity (an individual who explores a particular winery's wine offerings). The Customer can visit a winery (if a winery has an event such as a wine tasting) and the Customer can then review the wines based on their experience. Review (in this context) would be a relationship or an entity -- this would have been established once we had a consultation with our tutor.

SECOND DRAFT

The second iteration of the ER Diagram. We received clarification on how we should interpret the relationships, attributes, and entities in the given Winery scenario. Please find the ER Diagram below:
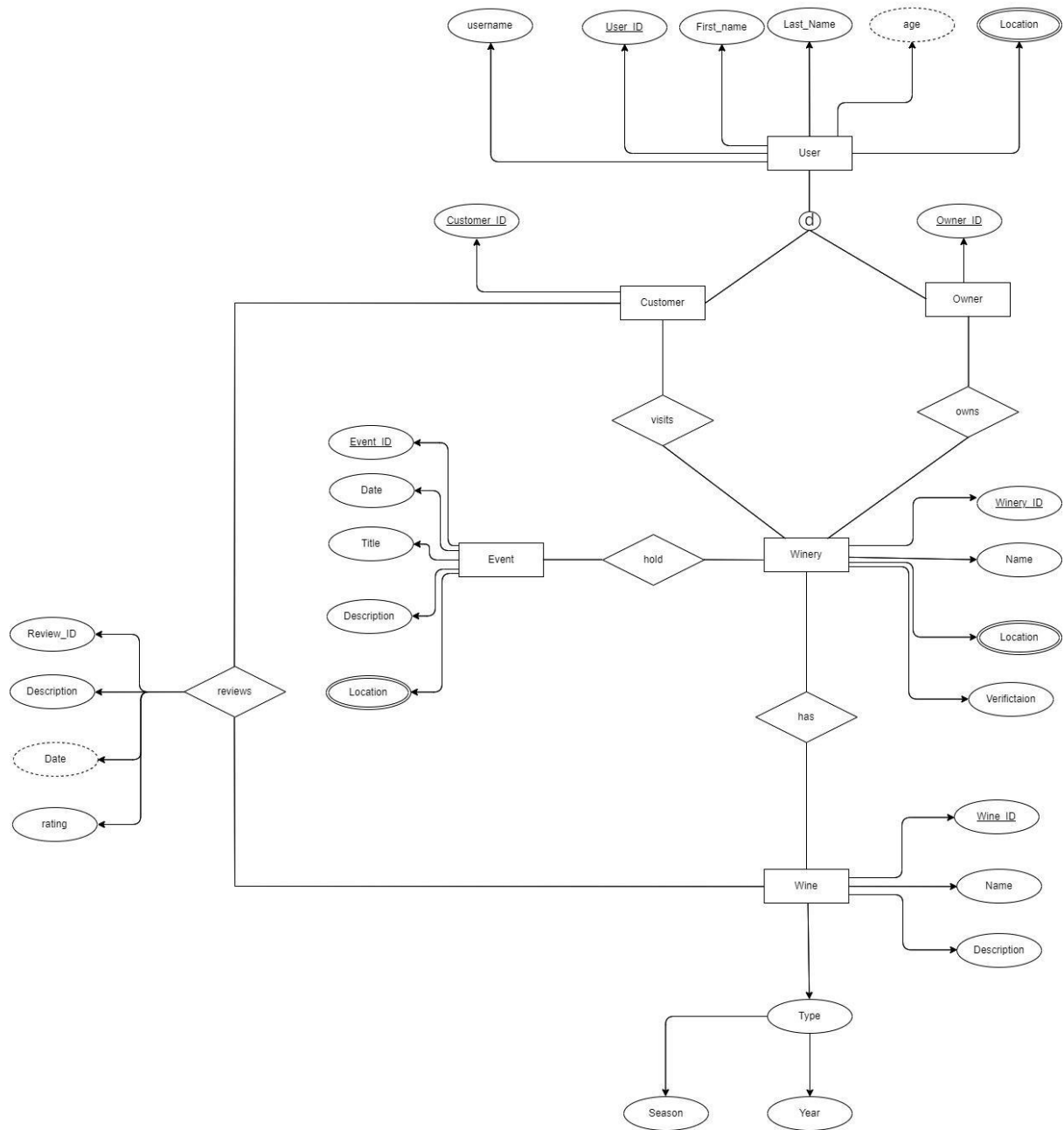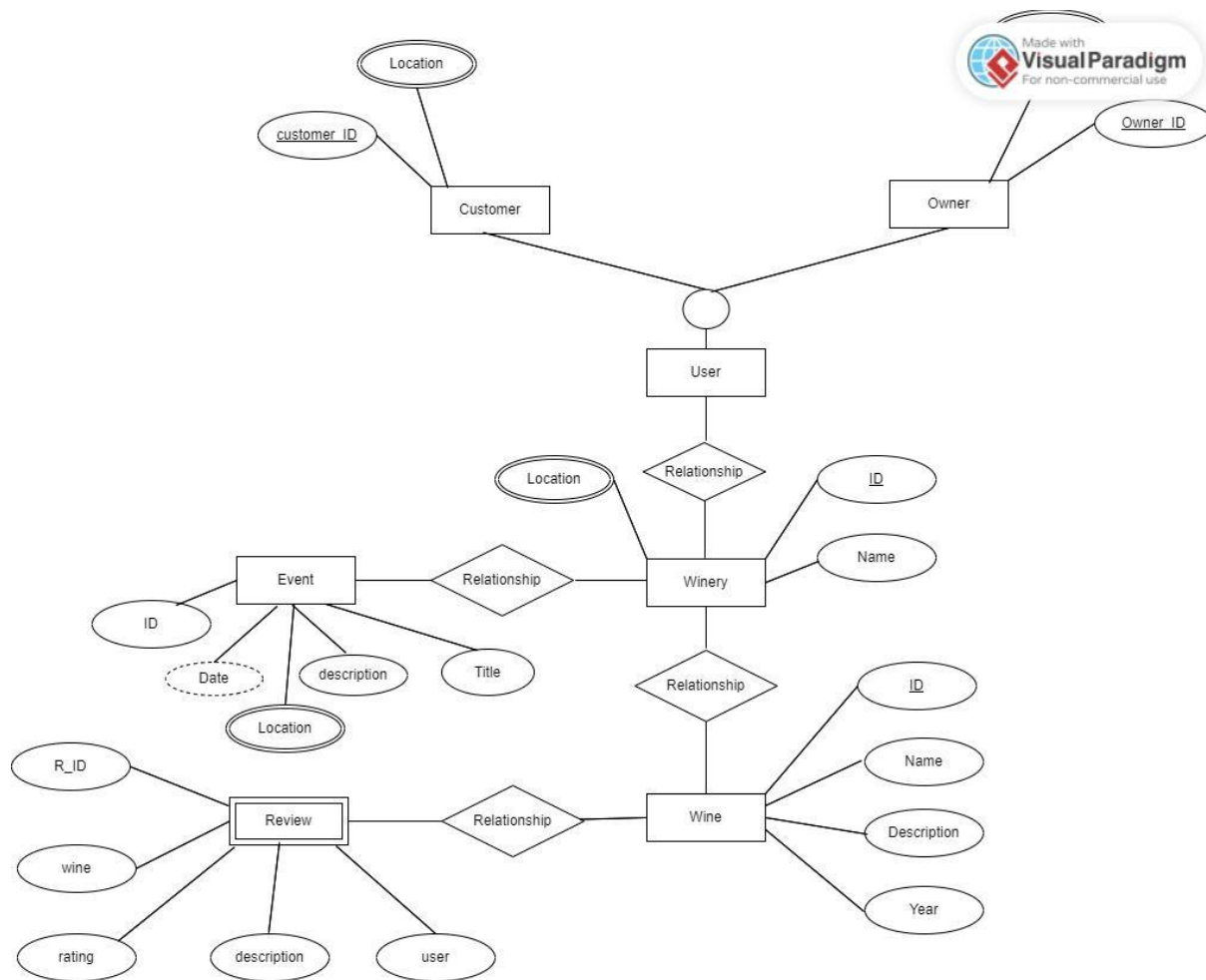
A rough sketch of a complete and more thought-out diagram follows:
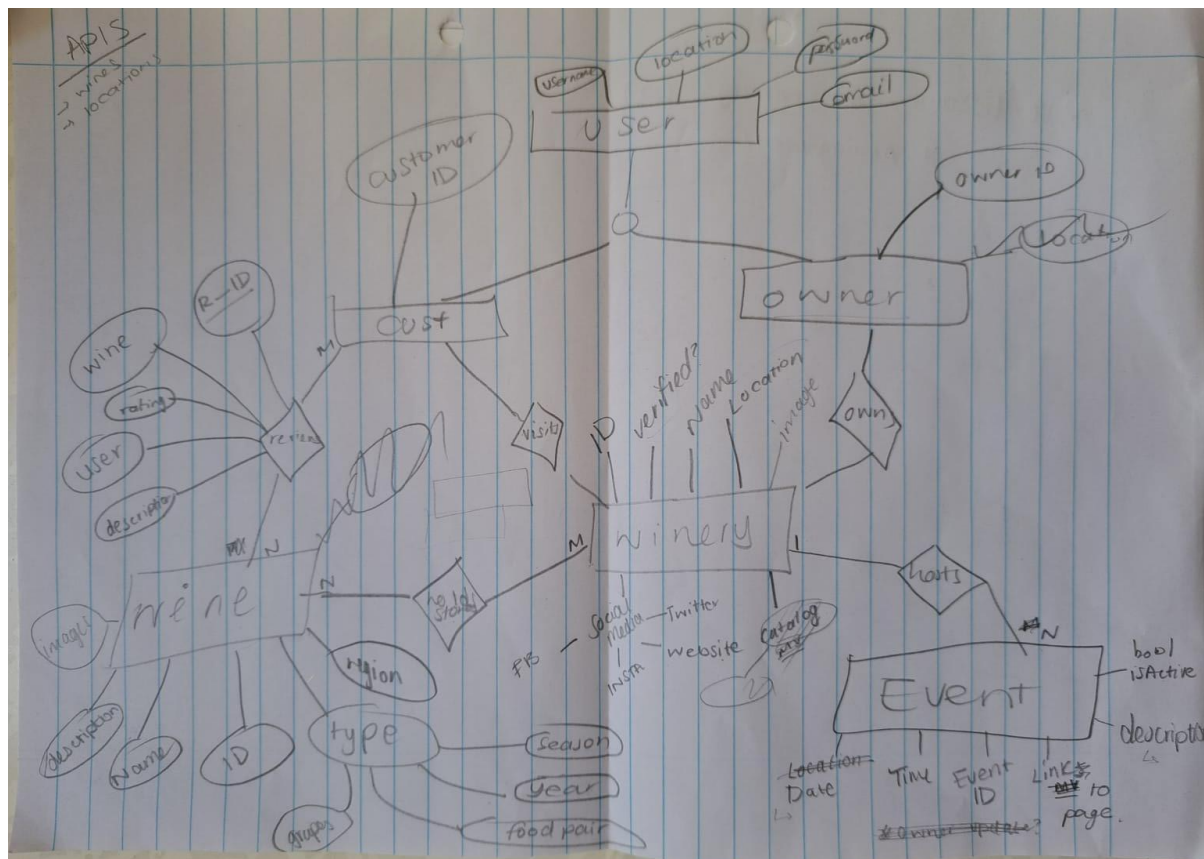
Numerous inclusions have been made to our ER diagram following our tutor consultation. An Event entity has been introduced, a Review relationship between Customer and Wine has been established and our entities have been expressed in clearer terms by introducing new (and existing) attributes as well as mapping out how they fit in the grand scheme of the Winery Scenario.

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THIRD DRAFT
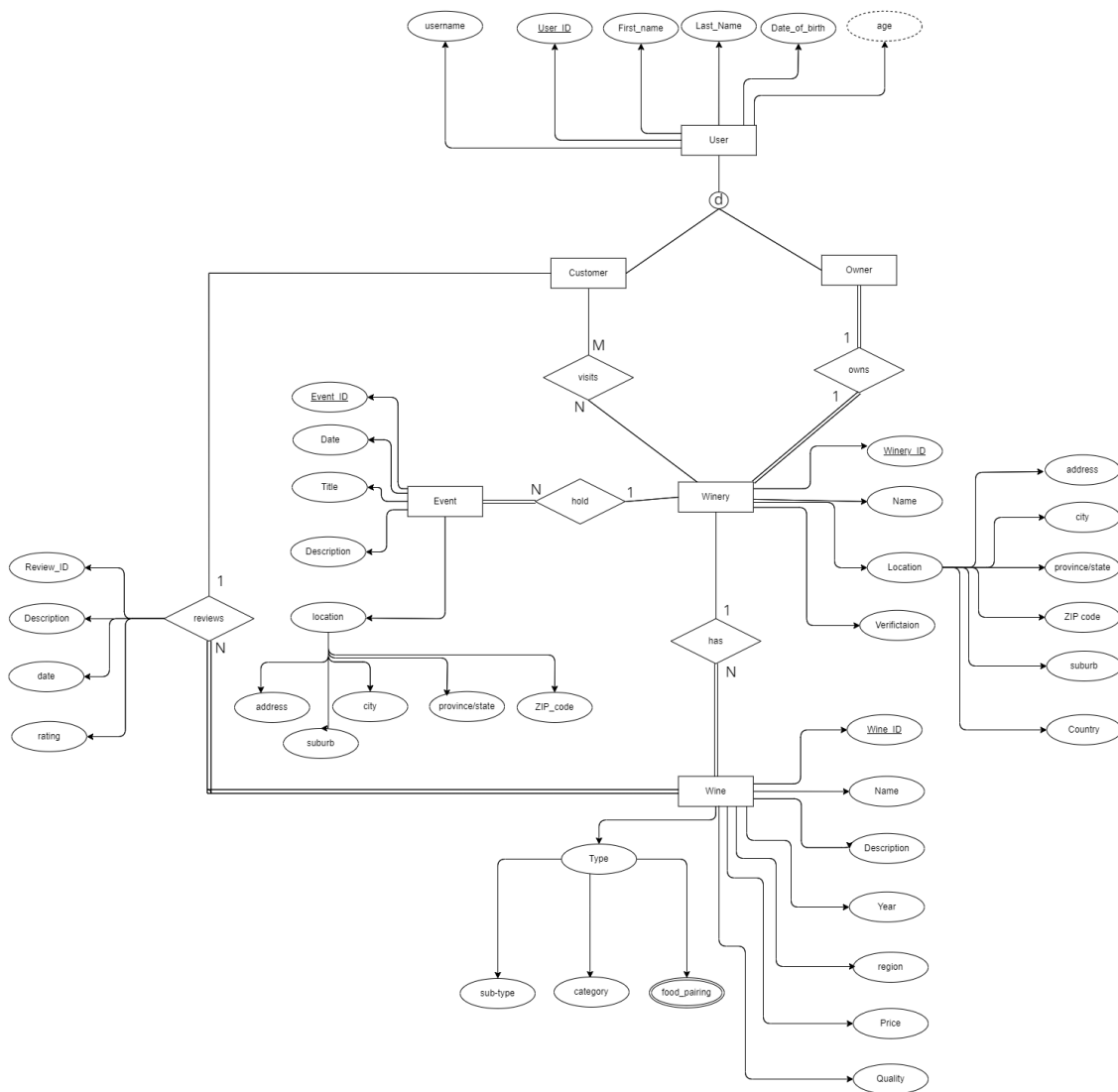
This is the third draft of the (E)ER-Diagram. Cardinality was added as well as a change to the review entity that became a relationship between the customer and the wine. More attributes were added that were missed due to an overlook.

FOURTH DRAFT (FINAL)
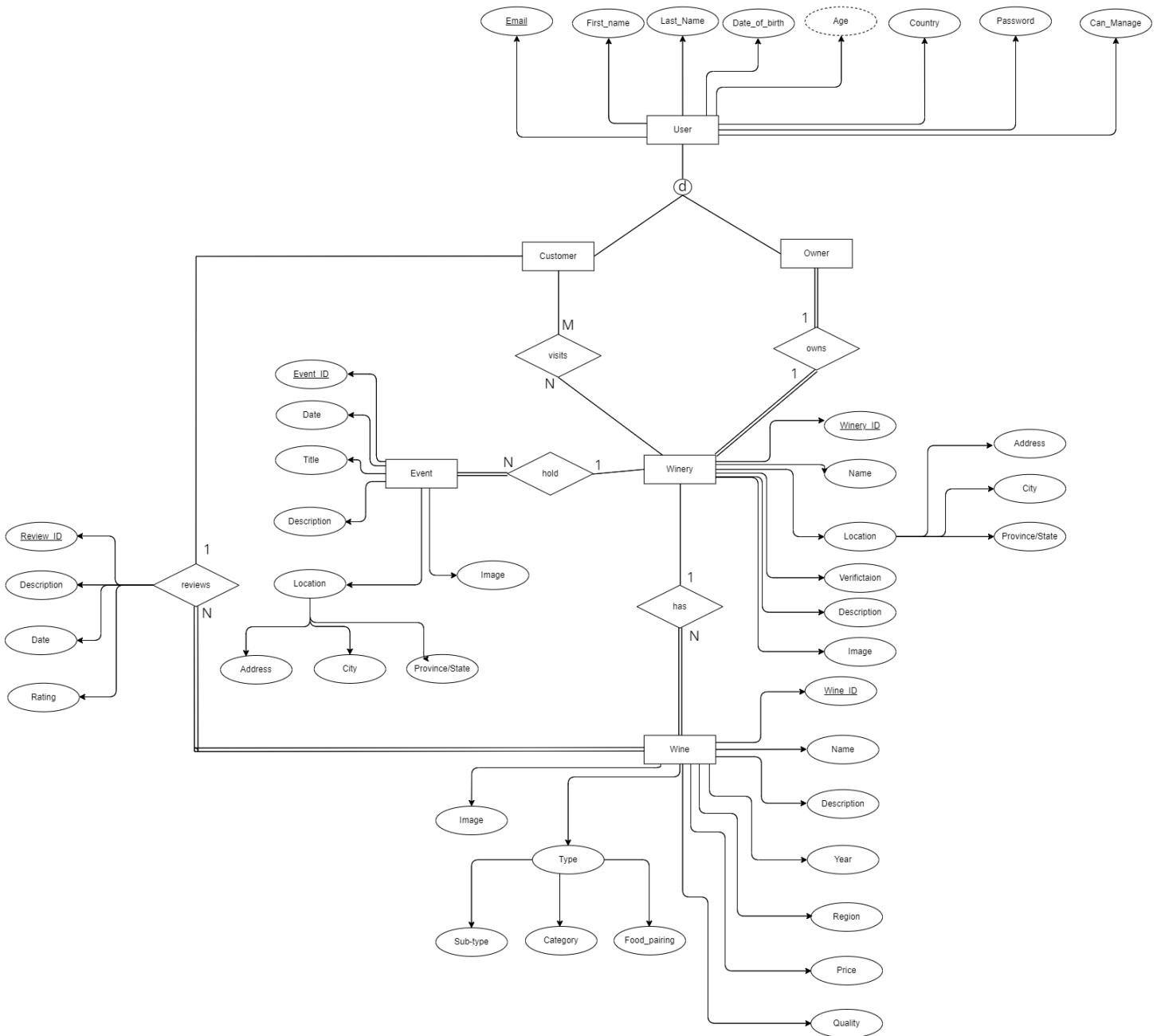
Some attributes were removed while others were added to allow easier usage for the user. This has allowed for the finish product of the (E)ER- diagram.

ASSUMPTIONS

- A User is the way to keep track of everyone using this web program.
- User is divided into a Customer and Owner. A user can only be one or the other.
- A customer would visit a winery, while the owner would own the winery.
- The customer would make reviews on the wine. An owner cannot.
- Winery has wines, and the winery also acts as the wine's brand name.
- An event that the winery holds would be recorded to ensure customers have a view of the events.
- Relationship assumptions:
    1. One customer can have multiple people visiting the (multiple/none or so)winery.
    2. There is full dependency on the user and review. A customer can make multiple reviews on a wine.
    3. The reasoning of not adding owner and wine relationship is to ensure that an owner does not add reviews that could be misleading.
    4. Winery would hold multiple wines.
    5. Winery would keep track of the events that the winery would participate/hold.

TASK THREE: (E)ER-DIAGRAM TO RELATIONAL MAPPING

FIRST DRAFT

User

Username	First_Name	Last_Name	Email	Birthday	City	Suburb	Province / State	Country	Can_Manage

Customer

Username	Can_Manage

Owner

Username	Can_Manage	Winery

Winery

Winery_ID	Name	Address	City	Suburb	Verification

Event

Event_ID	Date	Title	Description	Suburb	City	Address	Winery

Wine

Wine_ID	Name	Description	Year	Region	Category	Subtype	Pairing

Reviews

Review_ID	Description	Date	Rating	Wine	Customer

Pairings

Pairing_ID	Food_Type

Our first draft was made before the ER Diagram had been finalised, and so we did not focus on step-by-step breakdowns until we had finalised the ER in case of changes made. This draft covers the basic entities (User: Customer and Owner, Winer, Wine, Event, Reviews and Pairings), attributes and foreign key links found within our database.

SECOND DRAFT

User

UserID	Username	First_Name	Last_Name	Email	Birthday	City	Suburb	Province / State	Country	Can_Manage

Customer

Username	Can_Manage

Owner

Username	Can_Manage	Winery

Winery

Winery_ID	Name	Address	City	Suburb	Province	ZIP_Code	Country	Verification

Event

Event_ID	Date	Title	Description	Address	City	Suburb	Province	ZIP_Code	Winery

Wine

Wine_ID	Name	Description	Year	Region	Price	Quality	Category	Subtype	Pairing

Reviews

Review_ID	Description	Date	Rating	Wine	Customer

We played around with concepts of using a UserID and removed the Pairings table. We decided that the list will not be enumerated and would rather just be dependent on user input. We expanded on the Location values as well.

THIRD DRAFT

User

Email	First_Name	Last_Name	Birthday	Country	Can_Manage

Customer

Email	Can_Manage

Owner

Email	Can_Manage	Winery

Winery

Winery_ID	Name	Address	City	Province	Verification

Event

Event_ID	Date	Title	Description	Address	City	Province	Winery

Wine

Wine_ID	Name	Description	Year	Region	Price	Quality	Category	Subtype	Pairing

Reviews

Review_ID	Description	Date	Rating	Wine	Customer

We decided to simplify the locations and so removed any excess information from the mapping. We decided that the only user location that is important would be Country for statistical purposes whilst the nearby locations would be determined through the Winery city and the search function. We decided to remove UserID and make the email the username. We ensured that the Specializations linked correctly to the User generalisation.

FOURTH DRAFT (FINAL)

User

Email	First_Name	Last_Name	Birthday	Country	Can_Manage	Password

Customer

Email	Can_Manage

Owner

Email	Can_Manage	Winery

Winery

Winery_ID	Name	Address	City	Province	Verification	Description	Image

Event

Event_ID	Date	Title	Description	Address	City	Province	Winery	Image

Wine

Wine_ID	Name	Description	Year	Region	Price	Quality	Category	Subtype	Pairing	Image

Reviews

Review_ID	Description	Date	Rating	Wine	Customer

Missing attributes were added.

STEP ONE: REGULAR ENTITY TYPES

Simple attributes were added and any composite attributes were added as well from the ER schema.
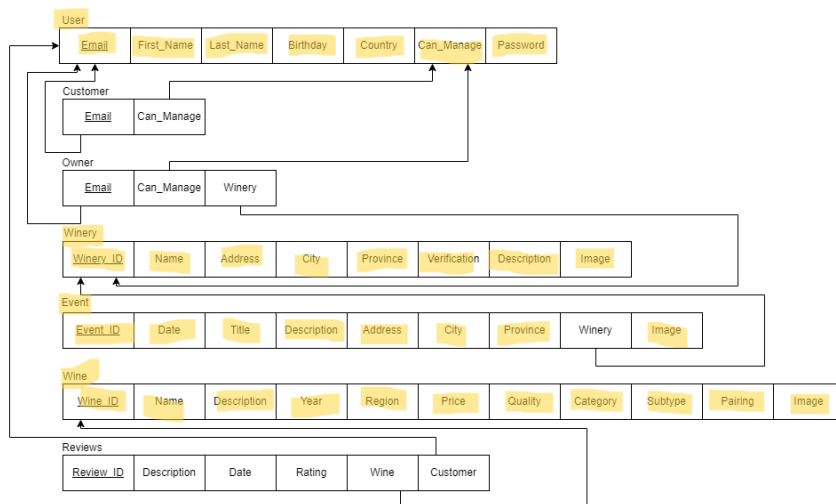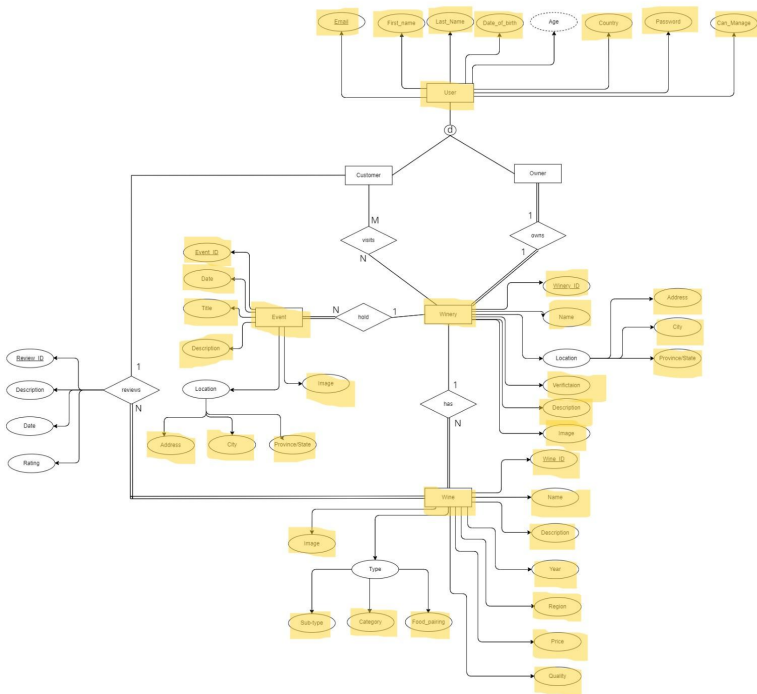
STEP TWO: WEAK ENTITY TYPES

- There are no weak entities

STEP THREE: 1:1 RELATIONSHIPS

A foreign key approach was used as multiple accounts owner accounts could be made for one winery to an extent, but one account manages one winery. Therefore the only existing 1:1 relationship is between the winery and owner.
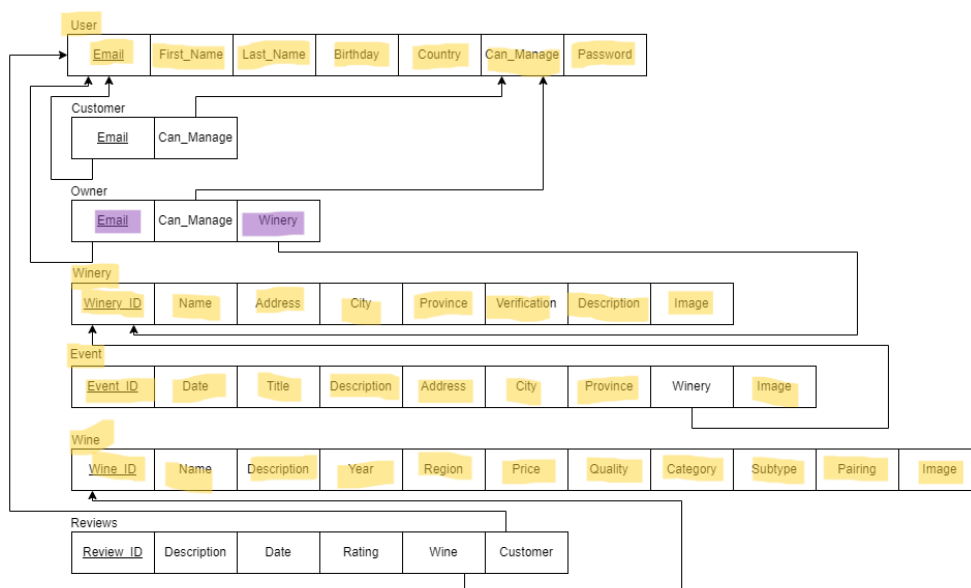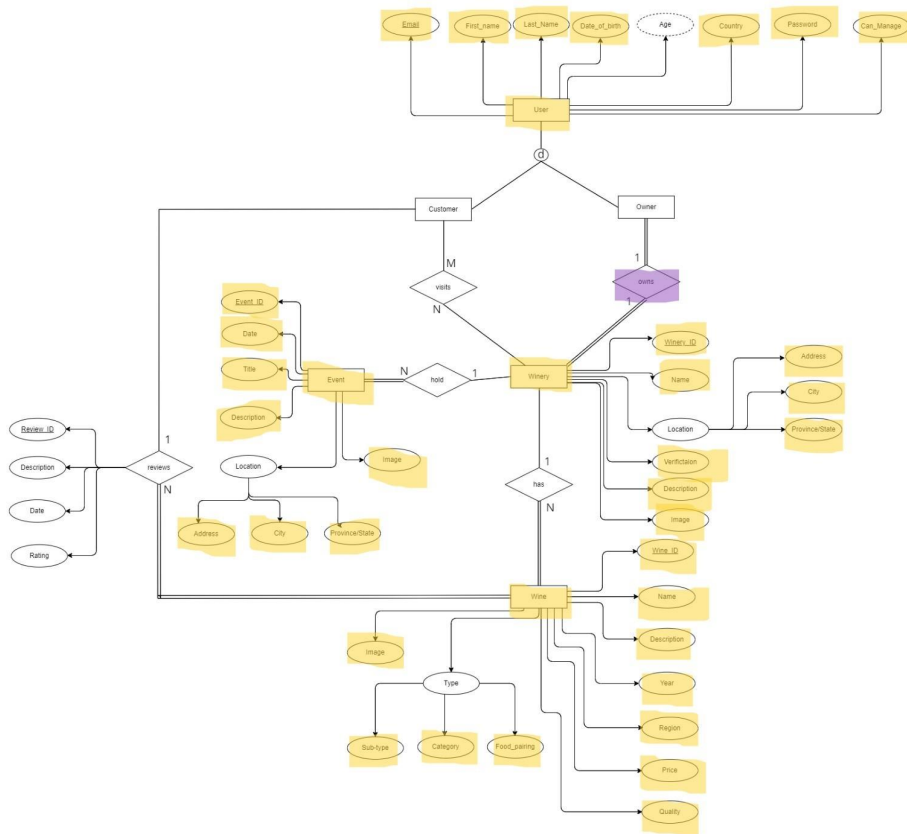
STEP FOUR: 1:N RELATIONSHIPS

All 1:N relationships were mapped. The review relationship was therefore added as a table due to its attributes. As identified, there exists 3 1:N relationships.
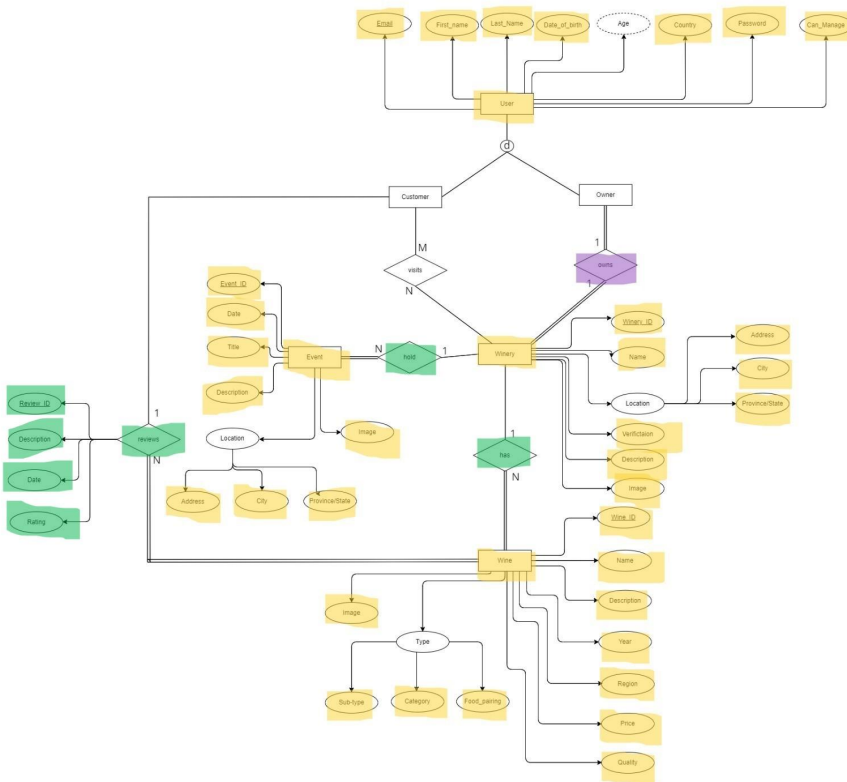
STEP FIVE: M:N RELATIONSHIPS

There exists only one M:N relationship, existing between customer and winery.
This exists through connecting the primary keys.
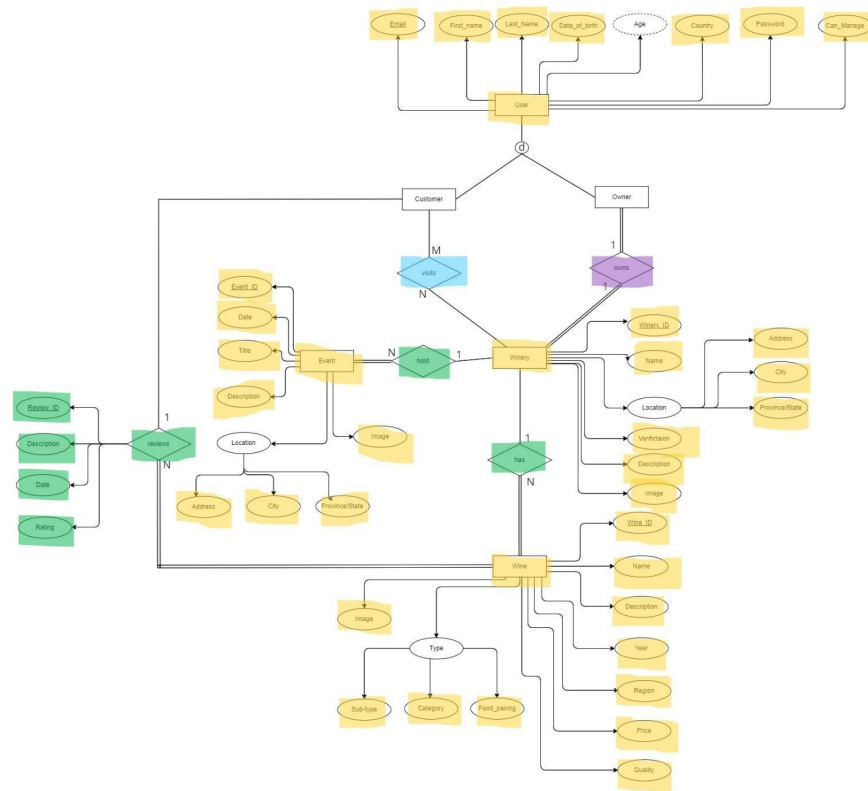
STEP SIX: MULTIVALUED ATTRIBUTES

- No multivalued attributes

STEP SEVEN: N-ARY RELATIONSHIPS

- No N-ary relationships

STEP EIGHT: SPECIALISATIONS AND GENERALISATIONS

The disjointness of the user as customer and owner was mapped in Relational schema. The appropriate keys were used to connect them to any necessary entities/tables.(Some arrowing was missed but was corrected in the final map colouring)
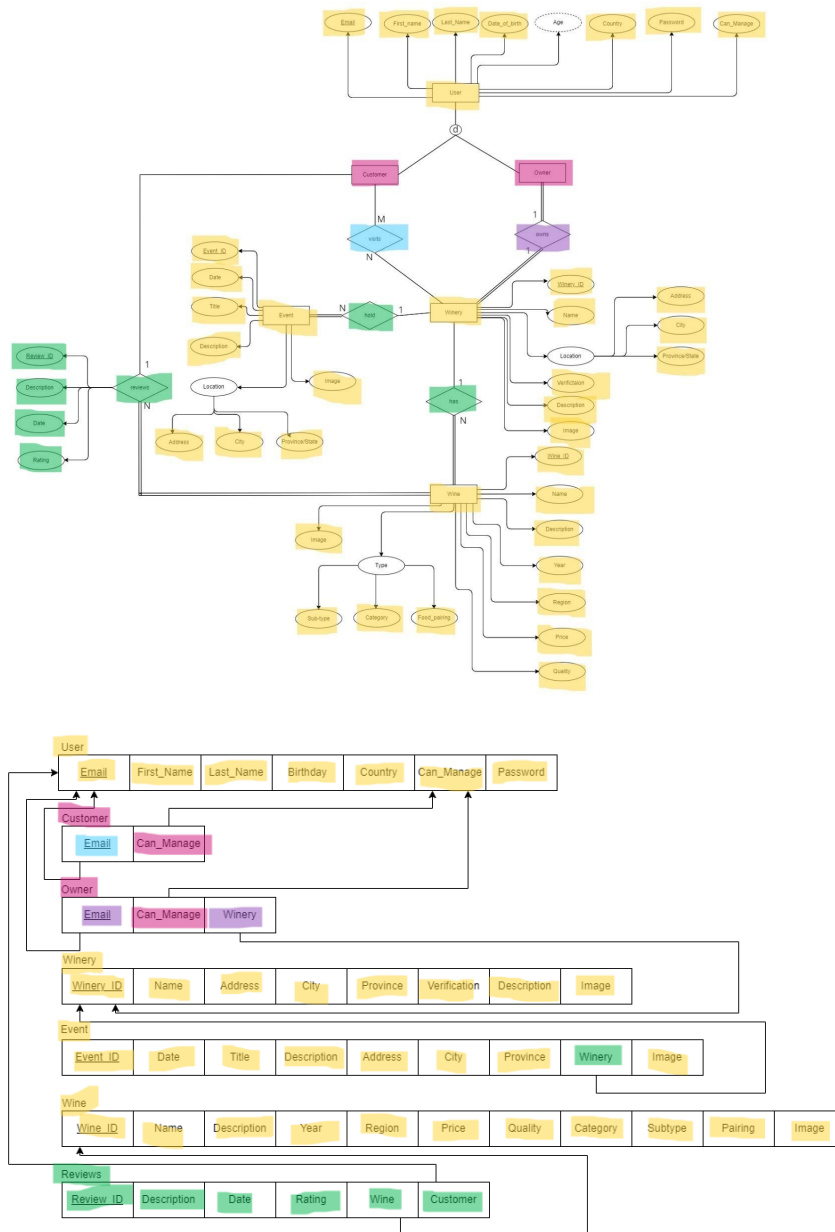
STEP NINE: UNIONS

- No unions

FINAL (E)ER AND MAPPING WITH COLOURING

This is the final colouring with all the relevant steps colour-coded. This can be properly viewed above with the step description.
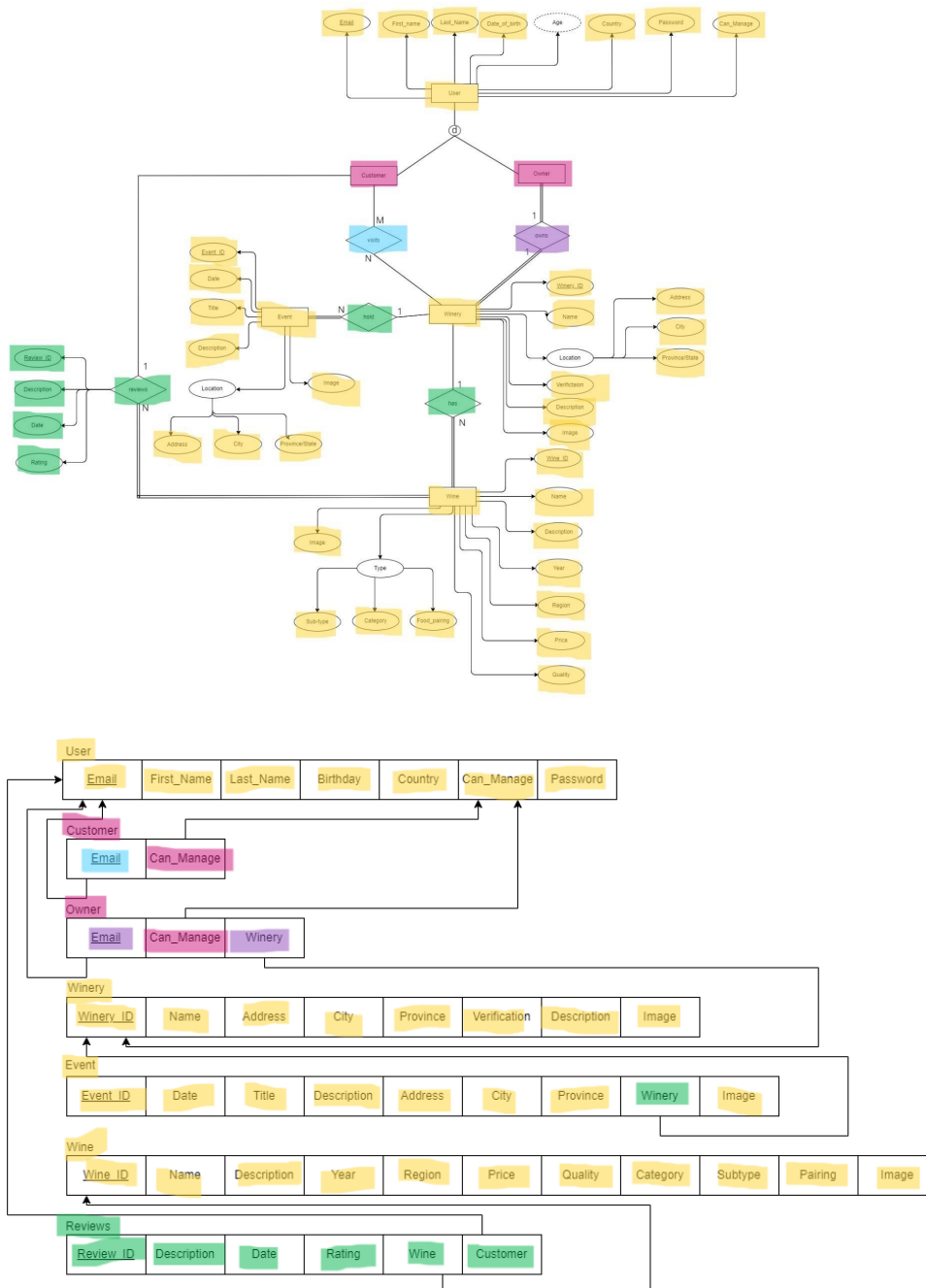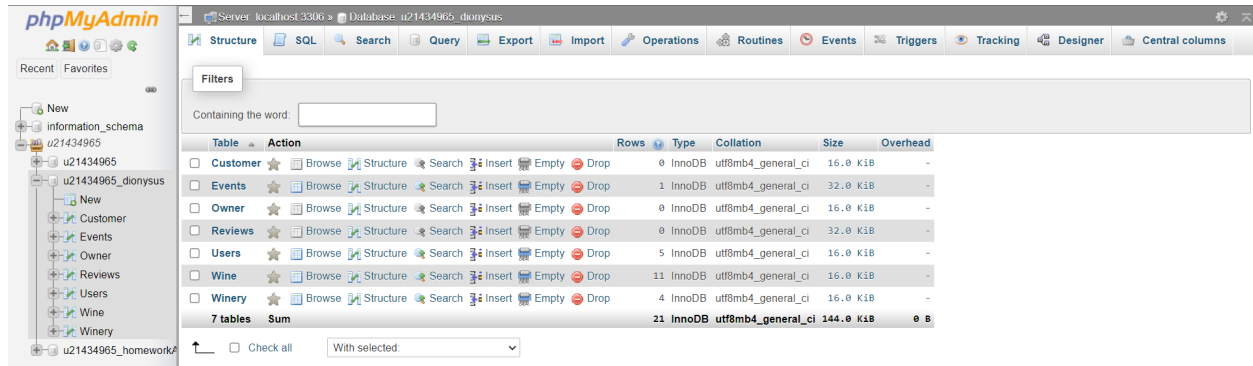
ASSUMPTIONS

- There may be multiple food pairings that the winery/owner have recognised,therefore it is a text variable type in the database to allow efficient and convenient handling.
- Owners will be able to upload their verification certificate for Dionysus staff to update as verified on retrieval.
- Catalog remains a concept
- Users would type in the location where they are visiting as a search. The user visiting location would not need to be stored.
- The owner table will help identify which winery the owner has.
- Reviews will have foreign keys connecting it to wine and customer so that those details could be identified when viewing a review.
- Event will be connected to the Winery using a foreign key.

TASK FOUR: RELATIONAL SCHEMA

DATABASE

SQL statements targeted towards MariaDB:
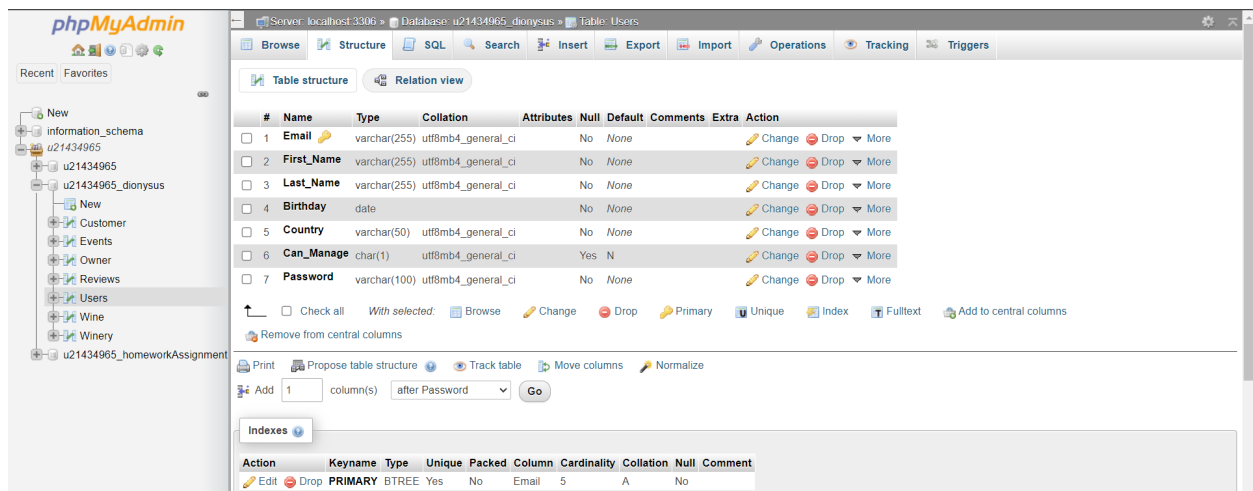
CREATE DATABASE u21434965_dionysus;

USER TABLE

SQL statements targeted towards MariaDB:

CREATE TABLE `Users` (

   `Email` varchar(255) NOT NULL,

```sql
    `First_Name` varchar(255) NOT NULL,

    `Last_Name` varchar(255) NOT NULL,

    `Birthday` date NOT NULL,

    `Country` varchar(50) NOT NULL,

    `Can_Manage` char(1) NOT NULL,

    `Password` varchar(100) NOT NULL

) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;



ALTER TABLE `Users`

    ADD PRIMARY KEY (`Email`);
```


MySQL returned an empty result set (i.e. zero rows). (Query took 0.0040 seconds.)

CREATE TRIGGER trg_check_age BEFORE INSERT ON Users FOR EACH ROW BEGIN DECLARE user_age INT; SET user_age = DATEDIFF(CURDATE(), NEW.birthday) / 365;
IF user_age < 18 THEN SIGNAL SQLSTATE '45000' SET MESSAGE_TEXT = 'User must be 18 years or older.'; END IF; END

[Edit inline] [Edit] [Create PHP code]

SQL statements targeted towards MariaDB:

```sql
-- Triggers `Users`

DELIMITER $$

CREATE TRIGGER `trg_check_age` BEFORE INSERT ON `Users` FOR EACH ROW BEGIN

    DECLARE user_age INT;

    SET user_age = DATEDIFF(CURDATE(), NEW.birthday) / 365;

    IF user_age < 18 THEN

        SIGNAL SQLSTATE '45000' SET MESSAGE_TEXT = 'User must be 18 years or
older.';

    END IF;

END

$$

DELIMITER ;
```

Error

SQL query: Copy ✏ Edit

INSERT INTO `Users` (`Email`, `First_Na

MySQL said: ⓘ

#1644 – User must be 18 years or older.
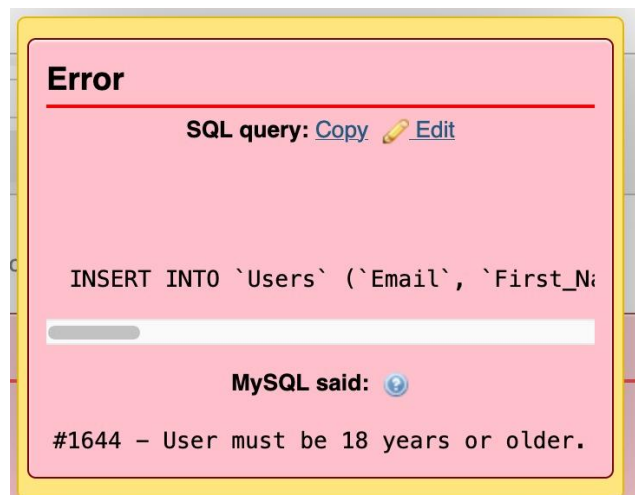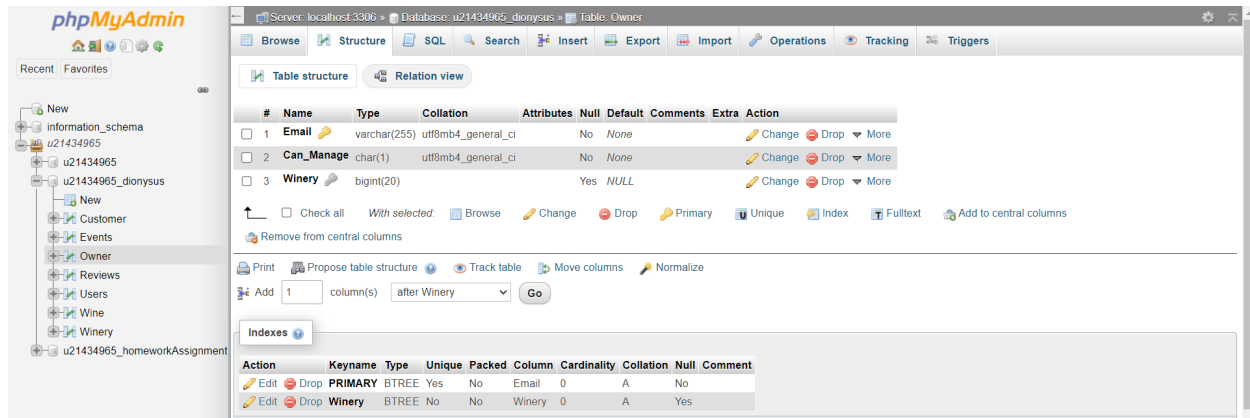
OWNER TABLE

SQL statements targeted towards MariaDB:

CREATE TABLE `Owner` (

  `Email` varchar(255) NOT NULL,

  `Can_Manage` char(1) NOT NULL,

  `Winery` bigint(20) DEFAULT NULL

) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

ALTER TABLE `Owner`

  ADD PRIMARY KEY (`Email`),

  ADD KEY `OwnerWineryFK` (`Winery`);

ALTER TABLE `Owner`

  ADD CONSTRAINT `OwnerUserFK` FOREIGN KEY (`Email`) REFERENCES `Users`
(`Email`) ON DELETE CASCADE ON UPDATE CASCADE,

  ADD CONSTRAINT `OwnerWineryFK` FOREIGN KEY (`Winery`) REFERENCES `Winery`
(`Winery_ID`) ON DELETE CASCADE ON UPDATE CASCADE;

CUSTOMER TABLE
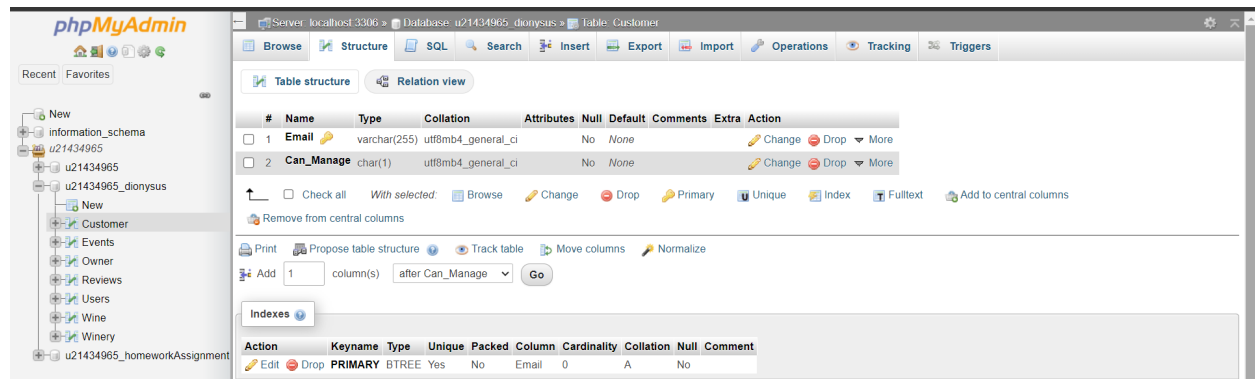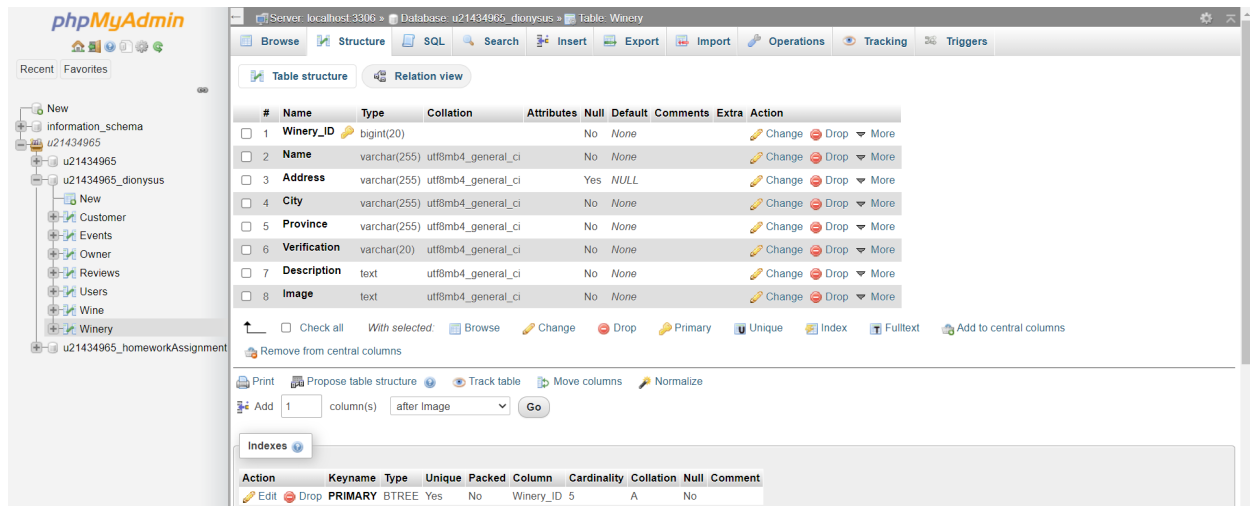
SQL statements targeted towards MariaDB:

CREATE TABLE `Customer` (

  `Email` varchar(255) NOT NULL,

  `Can_Manage` char(1) NOT NULL

) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

ALTER TABLE `Customer`

  ADD PRIMARY KEY (`Email`);

WINERY TABLE

SQL statements targeted towards MariaDB:

```sql
CREATE TABLE `Winery` (

  `Winery_ID` bigint(20) NOT NULL,

  `Name` varchar(255) NOT NULL,

  `Address` varchar(255) DEFAULT NULL,

  `City` varchar(255) NOT NULL,

  `Province` varchar(255) NOT NULL,

  `Verification` varchar(20) NOT NULL,

  `Description` text NOT NULL,

  `Image` text NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;


ALTER TABLE `Winery`

  ADD PRIMARY KEY (`Winery_ID`);
```

EVENT TABLE

SQL statements targeted towards MariaDB:

```
CREATE TABLE `Events` (

    `Event_ID` bigint(20) NOT NULL,

    `Title` varchar(150) NOT NULL,

    `Date` date NOT NULL,

    `Description` text NOT NULL,

    `Address` varchar(255) NOT NULL,

    `City` varchar(255) NOT NULL,

    `Province` varchar(255) NOT NULL,

    `Winery` bigint(20) NOT NULL,

    `Image` text NOT NULL

) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;



ALTER TABLE `Events`
```
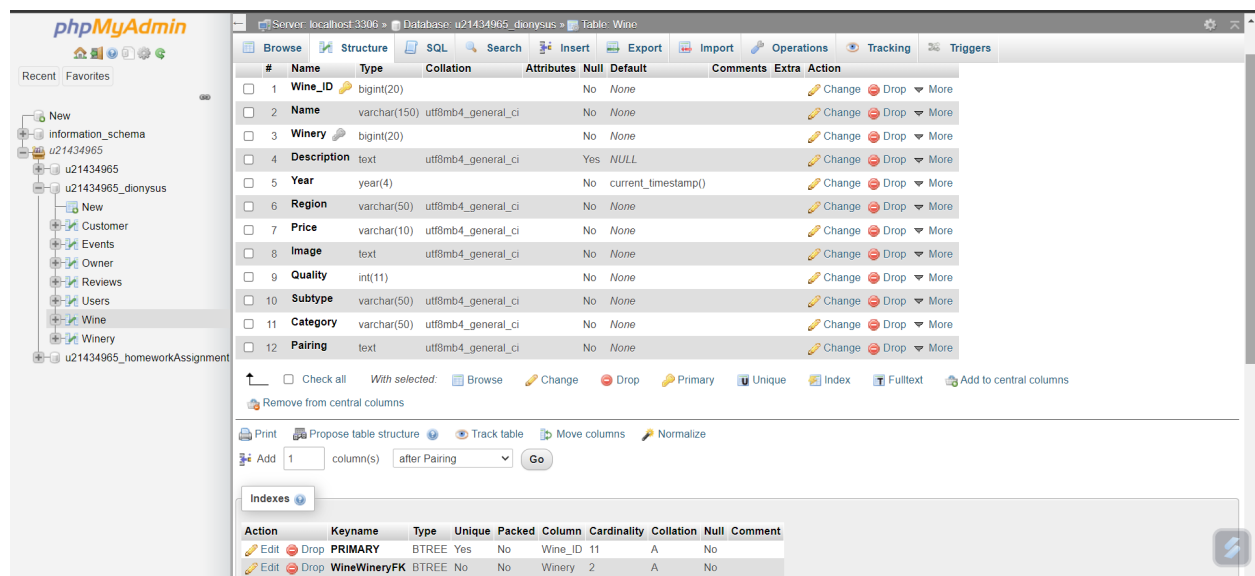
```
ADD PRIMARY KEY (`Event_ID`),

ADD KEY `EventWineryFK` (`Winery`);



ALTER TABLE `Events`

ADD CONSTRAINT `EventWineryFK` FOREIGN KEY (`Winery`) REFERENCES `Winery`
(`Winery_ID`) ON DELETE CASCADE ON UPDATE CASCADE;
```

WINE TABLE

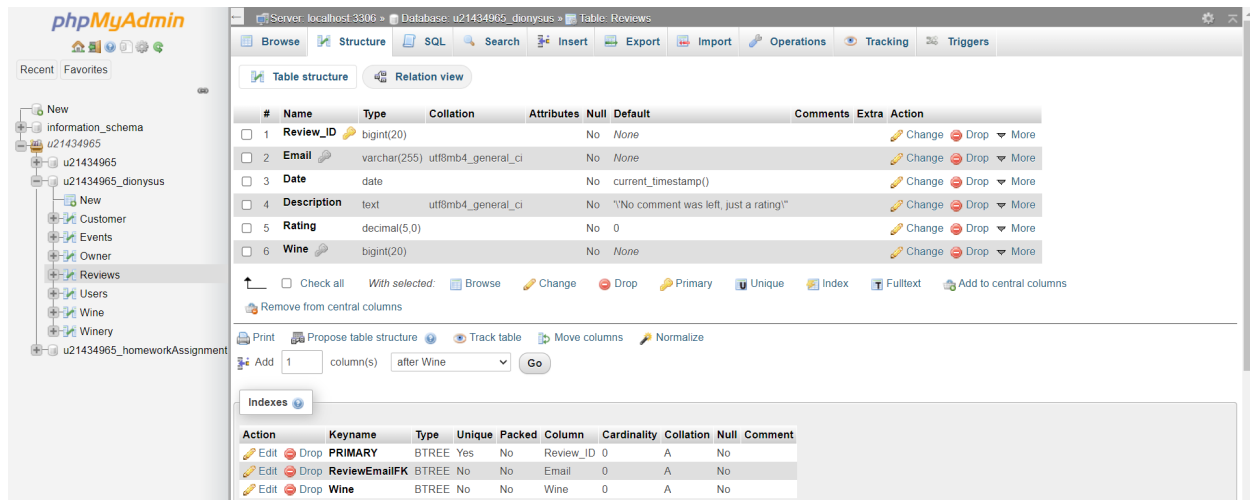SQL statements targeted towards MariaDB:

```
CREATE TABLE `Wine` (

  `Wine_ID` bigint(20) NOT NULL,

  `Name` varchar(150) NOT NULL,

  `Winery` bigint(20) NOT NULL,

  `Description` text DEFAULT NULL,
```

```sql
  `Year` year(4) NOT NULL DEFAULT current_timestamp(),

  `Region` varchar(50) NOT NULL,

  `Price` varchar(10) NOT NULL,

  `Image` text NOT NULL,

  `Quality` int(11) NOT NULL,

  `Subtype` varchar(50) NOT NULL,

  `Category` varchar(50) NOT NULL,

  `Pairing` text NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;


ALTER TABLE `Wine`

  ADD PRIMARY KEY (`Wine_ID`),

  ADD KEY `WineWineryFK` (`Winery`);



ALTER TABLE `Wine`

  ADD CONSTRAINT `WineWineryFK` FOREIGN KEY (`Winery`) REFERENCES `Winery`
(`Winery_ID`) ON DELETE CASCADE ON UPDATE CASCADE;

COMMIT;
```

REVIEW TABLE

SQL statements targeted towards MariaDB:

CREATE TABLE `Reviews` (

  `Review_ID` varchar(20) NOT NULL,

  `Email` varchar(255) NOT NULL,

  `Date` date NOT NULL DEFAULT current_timestamp(),

  `Description` text NOT NULL DEFAULT '\'No comment was left, just a rating\'',

  `Rating` decimal(5,0) NOT NULL DEFAULT 0,

  `Wine` bigint(20) NOT NULL

) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

ALTER TABLE `Reviews`

  ADD PRIMARY KEY (`Review_ID`),

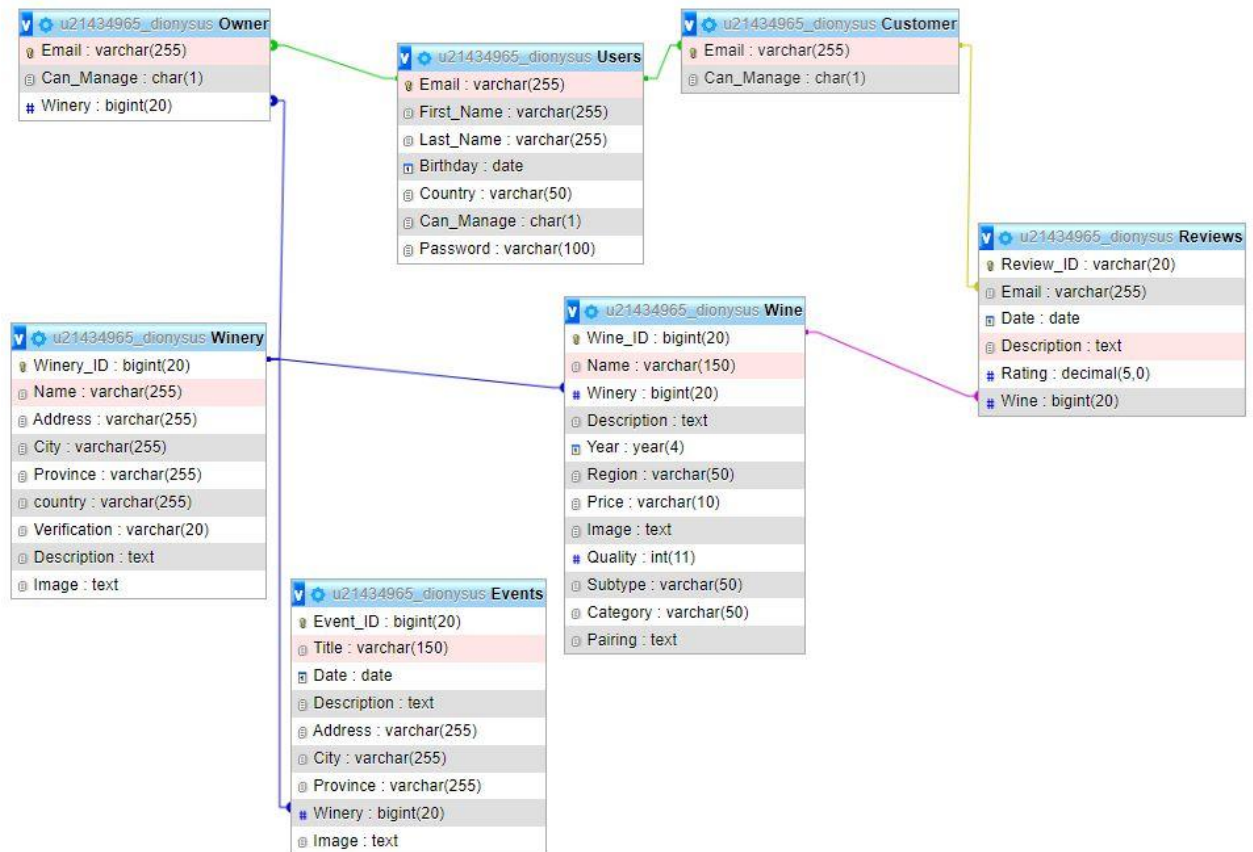 ADD KEY `ReviewEmailFK` (`Email`),

  ADD KEY `ReviewWineFK` (`Wine`);

```
ALTER TABLE `Reviews`

  ADD CONSTRAINT `ReviewEmailFK` FOREIGN KEY (`Email`) REFERENCES `Customer`
(`Email`) ON DELETE CASCADE ON UPDATE CASCADE,

  ADD CONSTRAINT `ReviewWineFK` FOREIGN KEY (`Wine`) REFERENCES `Wine`
(`Wine_ID`) ON DELETE CASCADE ON UPDATE CASCADE;
```

FINAL SCHEMA

TASK FIVE: WEB-BASED APPLICATION

The web-based application has been achieved and can be implemented as necessary,further instructions on how to use it can be found in the readme.txt found in the same folder.

SQL QUERIES

- ➔ Insert
- ➔ Delete
- ➔ Select
- ➔ Create
- ➔ Add
- ➔ Alter
- ➔ Delete Cascade
- ➔ Update Cascade
- ➔ Create trigger
- ➔ Declare
- ➔ Set
- ➔ Update

TASK SIX: DATA

Data population was achieved using a mixture of both manual (sql calls)insertion as well as using comma-delimited files(csv) obtained/generated from an online source to populate the tables.

The csv population method was used to upload data as it was more efficient. Due to us needing more specific/unique data to populate our data, manual insertion was used to ensure that pictures were loading, and proper associated sites were visible.

Another notable method that was used was the API as during testing data was added (among other actions).

Data Summary

Summary:

- 55 customers
- 10 Events
- 17 owners
- 28 reviews
- 75 users
- 220 wines
- 18 wineries

And counting….

Wineries and wine of notable mentions:

- Castello di Amorosa- Italy
- Bodegas Torres-Spain
- Château Margaux-France
- Penfolds Magill Estate-Australia
- Robert Mondavi Winery-California
- Bosman Family Vineyards-South Africa

Are all notable wineries as they all have (+)10 wines each.