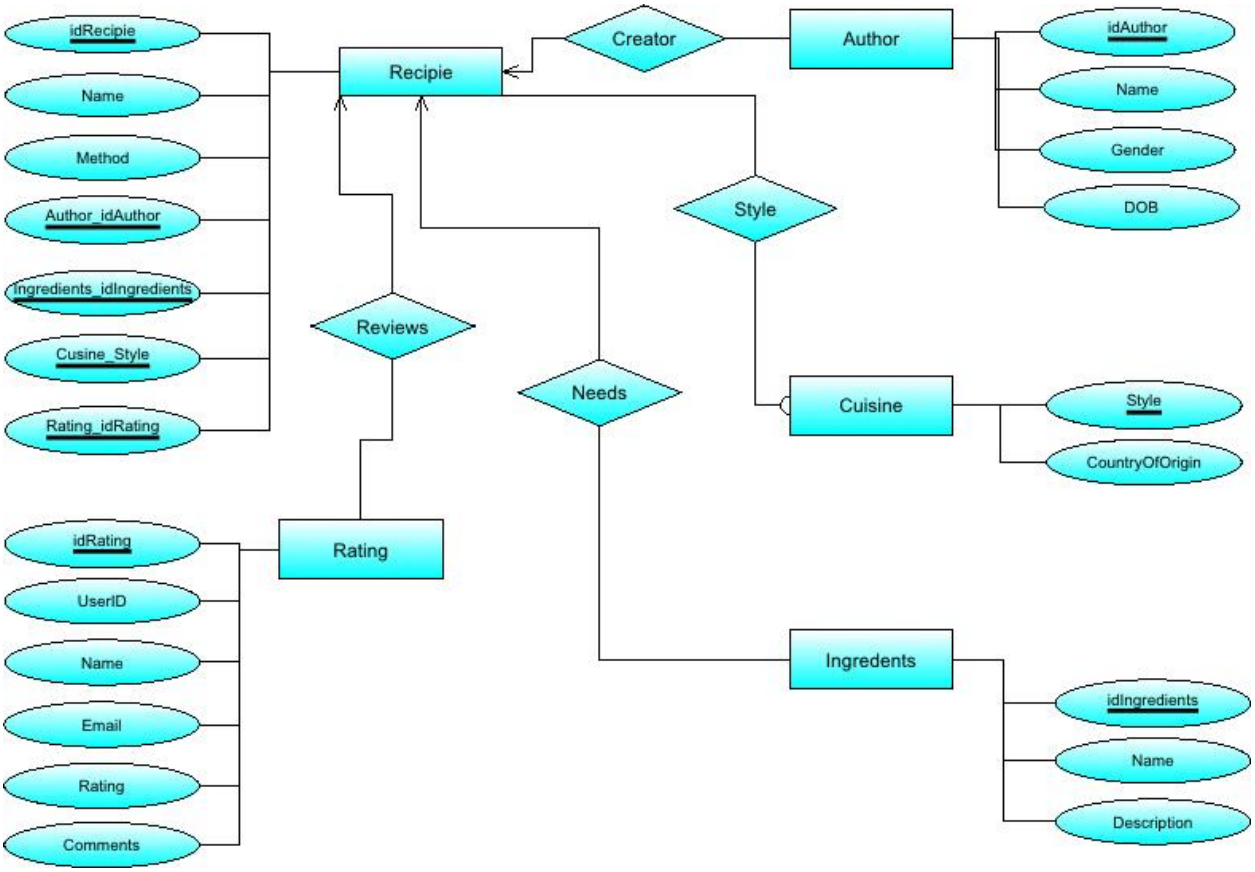
Question 1: ER Model



Question 2: The Relational Model

Customer(customer-no, name, email)

Order(order-no, order-date, handling-cost)

Includes(order-no*, product-no*, unit-price, quantity)

Product(product-no, product-name, list-price)

Question 3: SQL

1. How Many accounts are of type ‘credit’

```
SELECT count(accNumber)

FROM account

WHERE type = "credit";
```

2. List all employees currently working as a ‘teller’ that have a ‘henry’ somewhere in their name

```
SELECT employee.employeeID, employee.firstName, employee.lastName, worksAt.employeeID,
worksAt.occupation

FROM employee

INNER JOIN worksAt

ON employee.employeeID=worksAt.employeeID

WHERE employee.firstName like '%henry%' or employee.lastName like '%henry%' and
worksAt.occupation = 'teller';
```

3. Provide a list of Customers whose balance exceeds $50,000 and aged under 65, list must be alphabetical order of last name

```
SELECT customer.ID, customer.firstName, customer.lastName, customer.dateOfBirth,
has.accNumber, has.ID, account.accNumber, account.balance

FROM customer

INNER JOIN has on customer.ID=has.ID

INNER JOIN account on has.accNumber=account.accNumber

WHERE DATEDIFF(customer.dateOfBirth,CURDATE()) <'65'

ORDER BY customer.lastName asc
```

4. List the account numbers of accounts registered with the branch identified by the BSB 633765 in Mooroolbark.

```
SELECT branch.BSB, branch.town, registered.BSB, registered.accNumber
FROM branch
INNER JOIN registered ON branch.BSB=registered.BSB
WHERE branch.BSB = 633765 and branch.town = 'Mooroolbark';
```

5. Which branch holds the least money

(assumption – smallest single account)

```
SELECT branch.BSB
FROM branch
INNER JOIN registered ON branch.BSB=registered.BSB
INNER JOIN account on registered.accNumber=account.accNumber
WHERE account.balance = (SELECT min(balance) FROM account)
```

Question 4: What is a deletion anomaly and how can we avoid encountering one in our database design

Deletion anomalies are where data is inadvertently deleted, mainly because of improper database design. For example a single table database with student and course details, if all of the students from a course were to be removed from the database all of the course details would be lost as well.

To avoid encountering this situation storing information in different tables relevant to the type of data being stored would elevate this, for example storing student details in one table, course details in another and using foreign keys to link them.