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| BAKERY DOCUMENTATION  Includes data dictionary, business rules and requirements, and ERD | Introduction  A comprehensive guide encompassing vital components essential for the efficient functioning of a bakery business. This documentation includes a Data Dictionary, Business Rules, Business Requirements, and an Entity-Relationship Diagram (ERD) meticulously crafted to provide clarity, structure, and insight into the bakery's operations.  Group 8  Ronaldo Martinez, Barry Shawn McCoy, Eman Arshad, Krupa Patel, Maybelline Melissa Medrano, Victor E Chavez, Angelo S Angel |

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# Business Requirements

1. Customer Onboarding and Loyalty Program Enrollment **(ANGELO)**
   1. Entities Involved: CUSTOMER, LOYALTY\_PROGRAM, GIFT\_CARD
   2. Description: New customers are registered in the system and are given the option to enroll in the loyalty program or purchase a gift card.
2. Product Creation and Inventory Management **(ANGELO)**
   1. Entities Involved: PRODUCT, INGREDIENT, RECIPE, INVENTORY, EQUIPMENT
   2. Description: New bakery items are created using specific recipes and ingredients. The inventory and equipment needed are updated accordingly.
3. Order Placement and Payment **(ANGELO)**
   1. Entities Involved: CUSTOMER, ORDER, PRODUCT, PAYMENT, TAX, CARD
   2. Description: Customers place orders for products, and payments are processed, including applicable taxes.
4. An employee is responsible for processing customer orders **(ANGELO)**
   1. Entities Involved: EMPLOYEE, ORDER, SHIFT
   2. Description: an employee processes orders of products
5. Suppliers provide Invoice after supplying inventory (ingredient and equipment) items **(ANGELO)**
   1. Entities Involved: SUPPLIER, INVOICE, EXPENSE, INVENTORY, INGREDIENT, EQUIPMENT
   2. Description: Produce a report detailing the cumulative expenses attributed to each supplier
6. Customers can review or rate any food served in the bakery (**Ronaldo**)
   1. Entities Involved: PRODUCT, REVIEW, RATING, CUSTOMER
   2. Description: a customer can rate and write reviews of each individual products
7. Some bakery items are given promotion, such as advertisements or flyers, to increase sales (**VICTOR**)
   1. Entities involved: PRODUCT, PROMOTION
   2. Description: a product can be part of a promotional activity
8. Catering and Events (**Barry**)
   1. Entities involved: CATERING, EVENT, EXPENSE, PRODUCT
   2. Description: a catering service serves multiple events
9. Bakery items must record their nutritional and allergy information (**Ronaldo**)
   1. Entities involved: PRODUCT, NUTRITIONAL\_INFO, ALLERGY\_INFORMATION
   2. Description: a product should have a nutritional information guided by it, as well list any allergens that it may have
10. Sales must be recorded after payments by customers are received (**ANGELO**)
    1. Entities involved: TAX, PAYMENT, SALES\_REPORT, ORDER
    2. Description: Must show only the total cash flow, disregarding taxes.
11. Employees are given training, which provide them with certifications after passing **(VICTOR)**
    1. Entities involved: EMPLOYEE, ROLE, TRAINING, CERTIFICATION
    2. Description: an employee must have their training certificate done days after their initial employment
12. Budgets provided to each department are recorded to expenses **(VICTOR)**
    1. Entities involved: EXPENSE, BUDGET, DEPARTMENT, INVENTORY
    2. Description: Expenses come from an allocated budget of each department that utilizes material stored in inventory.
13. Some ingredients are wasted since they are not used to their full amount during product creation (**ANGELO)**
    1. Entities involved: INGREDIENT, WASTE\_LOG
    2. Description: Some ingredients, during good creation, are not used to their full extent and end up being wasted.
14. Card payments **(ANGELO)**.
    1. Entities Involved: CUSTOMER, CARD, PAYMENT
    2. Description: It’s possible for a customer to use their relatives’ card as payments.
15. Products can be packaged and supplied to other markets (**VICTOR**)
    1. Entities involved: PRODUCT, PACKAGING, SUPPLIER.
    2. Description: A supplier can ship different products using a wide variety of packaging.

# Entities Involved

## Main Entities

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CUSTOMER | LOYALTY\_PROGRAM | GIFT\_CARD | PRODUCT | INGREDIENT |
| INVENTORY | EQUIPMENT | PLACED\_ORDER | PAYMENT | TAX |
| EMPLOYEE | SHIFT | INVOICE | EXPENSE | REVIEW |
| PROMOTION | SALES\_REPORT | CATERING | EVENT | NUTRITIONAL\_INFO |
| ROLE | TRAINING | BUDGET | DEPARTMENT | WASTE\_LOG |
| CERTIFICATION | RECIPE | SUPPLIER | SALARY | ZIP |
| ALLERGY\_INFO | PACKAGING | COMPANY\_CARD | CARD\_ISSUER | RATING |

## Associative Entities

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ORDER\_LINE | PRODUCT\_CREATION | INVOICE\_LINE | RECIPE\_STEP | EMPLOYEE\_CERTIFICATION |
| CUSTOMER\_EVENT | EMPLOYEE\_SHIFT | EMPLOYEE\_TRAINING | DEPARTMENT\_INVENTORY | PRODUCT\_ALLERGY |
| PRODUCT\_PACKAGING | PRODUCT\_PROMOTION | CATERING\_PRODUCTS | CUSTOMER\_CARD | INVENTORY\_EXPENSE |

**Note**:

* Some associative entities eventually became an entity of their own, replacing their composite primary keys with a surrogate key, while some maintain their associative status.
* This is because some associative entities are referenced by other entities. Since their composite primary keys are needed to be used as foreign keys, this method becomes inefficient. So, we replaced them with surrogate keys, reducing our # of reference keys to 1.

# Business Rules

**Customer**

1. A CUSTOMER may make many ORDERs.
2. A CUSTOMER may join the LOYALTY\_PROGRAM.
3. A CUSTOMER may buy many GIFT\_CARDs.
4. A CUSTOMER is located by a ZIP.
5. A CUSTOMER owns many CUSTOMER\_CARDs.
6. A CUSTOMER may write many REVIEWs.
7. A CUSTOMER may make many RATINGs.
8. A CUSTOMER may join many EVENTs.

**Gift Card**

1. A GIFT\_CARD may be bought by a CUSTOMER.

**Loyalty Program**

1. The LOYALTY\_PROGRAM may be joined by a CUSTOMER.

**Tax**

1. A TAX is added to many PAYMENTs.
2. A TAX is added to many EXPENSEs.

**Zip**

1. A ZIP locates many CUSTOMERs.
2. A ZIP locates many SUPPLIERs.
3. A ZIP locates many EMPLOYEEs.
4. A ZIP locates many EVENTs.

**Customer card**

1. A CUSTOMER\_CARD is owned by a CUSTOMER.
2. A CUSTOMER\_ CARD is used for many PAYMENTs.
3. A CUSTOMER\_ CARD is issued by a CARD.

**Supplier**

1. A SUPPLIER receives many INVOICEs.
2. A SUPPLIER is located by a ZIP.
3. A SUPPLIER may supply many EQUIPMENTs.
4. A SUPPLIER may supply many INGREDIENTs.
5. A SUPPLIER receives many PRODUCT\_PACKAGINGS.

**Invoice**

1. An INVOICE is received by a SUPPLIER.
2. An INVOICE is added to an EXPENSE.
3. An INVOICE is record to many INVOICE\_LINEs.

**Invoice line**

1. An INVOICE\_LINE is recorded from an INVENTORY.
2. An INVOICE\_LINE is recorded by an INVOICE.

**Order**

1. An ORDER may contain many ORDER\_LINEs.
2. An ORDER is made by a CUSTOMER.
3. An ORDER generates a PAYMENT.
4. An ORDER is processed by an employee through ATTENDANCE.

**Employee**

1. An EMPLOYEE has many EMPLOYEE\_SHIFTs.
2. An EMPLOYEE receives many EMPLOYEE\_CERTIFCATIONs.
3. An EMPLOYEE may be given many EMPLOYEE\_TRAININGs.
4. An EMPLOYEE is located by a ZIP.
5. An EMPLOYEE is assigned a ROLE.

**Shift**

1. A SHIFT is assigned to many EMPLOYEE\_SHIFTs.

**Employee shift**

1. An EMPLOYEE\_SHIFT processes many ORDERs.
2. An EMPLOYEE\_SHIFT is timed by a SHIFT.
3. An EMPLOYEE\_SHIFT is clocked in by an EMPLOYEE.

**Certification**

1. A CERTIFICATION is obtained by many EMPLOYEE\_CERTIFICATIONs.
2. A CERTIFICATION is granted from a TRAINING.

**Training**

1. A TRAINING generates a CERTIFICATION.
2. A TRAINING is given to many EMPLOYEE\_TRAININGs.

**Employee certification**

1. An EMPLOYEE\_CERTIFICATION may be given to an EMPLOYEE.
2. An EMPLOYEE\_CERTIFICATION is obtained by CERTIFICATION.

**Employee training**

1. An EMPLOYEE\_TRAINING is given to an EMPLOYEE.
2. An EMPLOYEE\_TRAINING is given by a TRAINING.

**Equipment**

1. An EQUIPMENT may be used in many PRODUCT\_CREATION.
2. An EQUIPMENT is assigned to an INVENTORY.
3. An EQUIPMENT may be supplied by a SUPPLIER.

**Inventory**

1. An INVENTORY is recorded to many INVOICE\_LINEs.
2. An INVENTORY is associated with an INGREDIENT.
3. An INVENTORY is associated with an EQUIPMENT.
4. An INVENTORY may be assigned to many DEPARTMENT\_INVENTORYs.
5. An INVENTORY is incurred in many INVENTORY\_EXPENSEs.
6. An INVENTORY is associated with a PRODUCT.

**Ingredient**

1. An INGREDIENT is stored in an INVENTORY.
2. An INGREDIENT may be supplied by a SUPPLIER.
3. An INGREDIENT may be included in many PRODUCT\_CREATIONs.
4. An INGREDIENT may record many WASTE\_LOGs.

**Product**

1. A PRODUCT is stored in an INVENTORY.
2. A PRODUCT is created from many PRODUCT\_CREATIONs.
3. A PRODUCT may go to many ORDER\_LINEs.
4. A PRODUCT is referenced from a RECIPE.
5. A PRODUCT is packaged with many PRODUCT\_PACKAGINGs.
6. A PRODUCT may be promoted with many PRODUCT\_PROMOTIONs.
7. A PRODUCT may be written many REVIEWS.
8. A PRODUCT may be made many RATINGs.
9. A PRODUCT determines a NUTRITIONAL\_INFO.
10. A PRODUCT may generate many PRODUCT\_ALLERGYs.
11. A PRODUCT may be sold to many CATERING\_PRODUCTs.

**Recipe**

1. A RECIPE is referenced by a PRODUCT.
2. A RECIPE is referenced from many RECIPE\_STEPs.

**Recipe step**

1. A RECIPE\_STEP is used in many PRODUCT\_CREATIONs.
2. A RECIPE\_STEP references a RECIPE.

**Recipe instruction**

1. A PRODUCT\_CREATION may include an INGREDIENT.
2. A PRODUCT\_CREATION may use an EQUIPMENT.
3. A PRODUCT\_CREATION uses a RECIPE\_STEP\_ID.
4. A PRODUCT\_CREATION builds up a PRODUCT.

**Payment**

1. A PAYMENT reports to a SALES\_REPORT.
2. A PAYMENT adds a TAX.
3. A PAYMENT is paid with a CUSTOMER\_CARD.
4. A PAYMENT is generated from an ORDER.

**Expense**

1. An EXPENSE is added from many INVENTORY\_EXPENSEs.
2. An EXPENSE is paid from a COMPANY\_CARD.
3. An EXPENSE is generated from a DEPARTMENT.
4. An EXPENSE is generated from many SALARYs.
5. An EXPENSE is added with a TAX.
6. An EXPENSE is generated from many INVOICEs.
7. An EXPENSE incurs from many EVENTs.

**Budget**

1. A BUDGET is made for a DEPARTMENT.

**Department**

1. A DEPARTMENT may use many DEPARTMENT\_INVENTORYs.
2. A DEPARTMENT may have many EXPENSEs.
3. A DEPARTMENT is assigned many BUDGETs.
4. A DEPARTMENT assigns many ROLEs.

**Department inventory**

1. A DEPARTMENT\_INVENTORY is used by a DEPARTMENT.
2. A DEPARTMENT\_INVENTORY is assigned from an INVENTORY.

**Order line**

1. An ORDER\_LINE is added from a PRODUCT.
2. An ORDER\_LINE is added from a ORDER.

**Inventory expense**

1. An INVENTORY\_EXPENSE is incurred from an INVENTORY.
2. An INVENTORY\_EXPENSE is added to an EXPENSE.

**Role**

1. A ROLE is assigned from a DEPARTMENT.
2. A ROLE is assigned to many EMPLOYEEs.
3. A ROLE is assigned a SALARY\_ID.

**Packaging**

1. PACKAGING may be assigned to many PRODUCT\_PACKAGINGs.

**Promotion**

1. PROMOTION provides many PRODUCT\_PROMOTIONs.

**Product packaging**

A PRODUCT\_PACKAGING packages a PRODUCT.

A PRODUCT\_PACKAGING is packaged with a PACKAGING.

**Review**

A REVIEW is written by a CUSTOMER.

A REVIEW is written to a PRODUCT.

**Rating**

* + - 1. A RATING is made by a CUSTOMER.
      2. A RATING is made to a PRODUCT.

**Nutritional info**

A NUTRITIONAL\_INFO is determined by a PRODUCT.

**Product allergy**

1. A PRODUCT\_ALLERGY is studied from PRODUCT.
2. A PRODUCT\_ALLERGY is present to an ALLERGY\_INFO.

**Allergy info**

1. An ALLERGY\_INFO may be present to many PRODUCT\_ALLERGYs.

**Customer card**

1. A CUSTOMER\_CARD may be to many PAYMENTs.
2. A CUSTOMER\_CARD is owned by a CUSTOMER.
3. A CUSTOMER\_CARD is issued by a CARD\_ISSUER.

**Catering products**

1. A CATERING\_PRODUCT sells a PRODUCT.
2. A CATERING\_PRODUCT is served from a CATERING.

**Catering**

1. A CATERING serves many CATERING\_PRODUCTs.
2. A CATERING is held by an EVENT.

**Event**

1. An EVENT may hold many CATERINGs.
2. An EVENT is incurred to an EXPENSE.
3. An EVENT is located by a ZIP.
4. An EVENT is hosted to many CUSTOMERs.

**Card issuer**

1. A CARD\_ISSUER issues many CUSTOMER\_CARDs.
2. A CARD\_ISSUER issues many COMPANY\_CARDs.

**Sales report**

1. A SALES\_REPORT records a PAYMENT.

**Recipe step**

1. A RECIPE\_STEP is used in many PRODUCT\_CREATIONs.
2. A RECIPE\_STEP references a RECIPE.

**Waste log**

1. A WASTE\_LOG records an INGREDIENT.

**Company card**

1. A COMPANY\_CARD pays many EXPENSEs.
2. A COMPANY\_CARD is issued by a CARD\_ISSUER.

**Salary**

1. A SALARY pays a ROLE.
2. A SALARY is incurred to an EXPENSE.

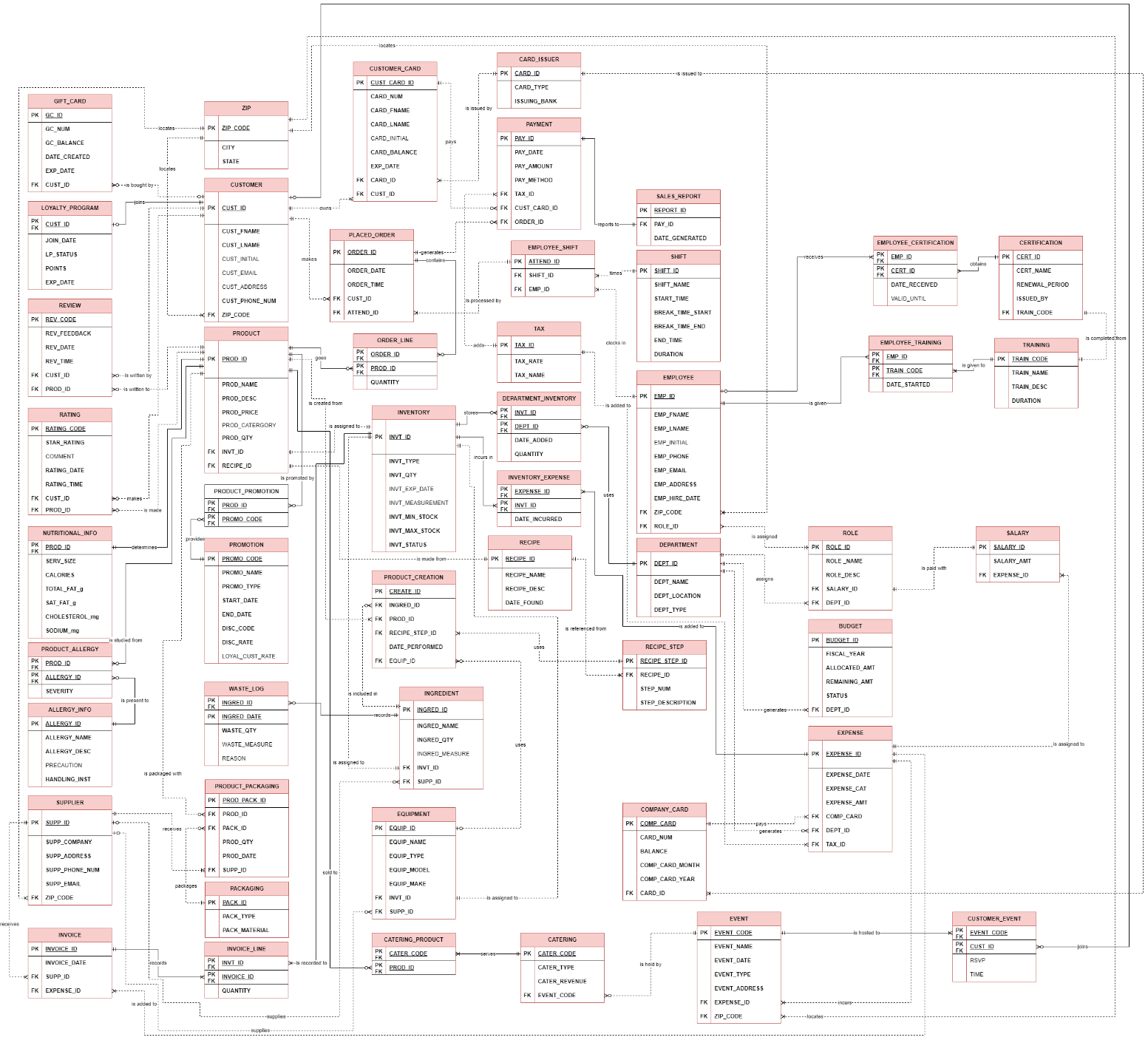
**Customer event**

1. A CUSTOMER\_EVENT is hosted by an EVENT.
2. A CUSTOMER\_EVENT invites a CUSTOMER.

# Data Dictionary

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Table Name** | **Attribute Name** | **Contents** | **Type** | **Format** | **Req?** | **PK or FK** | **FK Referenced Table** |
| CUSTOMER | CUST\_ID | Customer identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | CUST\_FNAME | Customer first name | VARCHAR(255) | Xxxxxxx | Y |  |  |
|  | CUST\_LNAME | Customer last name | VARCHAR(255) | Xxxxxxx | Y |  |  |
|  | CUST\_INITIAL | Customer Initial | CHAR(1) | X |  |  |  |
|  | CUST\_EMAIL | Customer email | VARCHAR(255) | Xxxxx@xxxx.xxx |  |  |  |
|  | CUST\_ADDRESS | Customer address | VARCHAR(255) | Xxxxxxx |  |  |  |
|  | CUST\_PHONE\_NUM | Customer phone number | VARCHAR(255) | Xxxxxxx |  |  |  |
|  | ZIP\_CODE | Zip code | INT, UNSIGNED | ##### | Y | FK | ZIP |
| GIFT\_CARD | GC\_ID | Gift card identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | GC\_NUM | Gift card 16-digit number | VARCHAR(255) | Xxxx-xxxx-xxxx-xxxx | Y |  |  |
|  | GC\_BALANCE | Remaining amount in the gift card | DECIMAL(10, 2) | ########.## | Y |  |  |
|  | DATE\_CREATED | Date the gift card was generated | DATE | Yyyy-mm-dd | Y |  |  |
|  | EXP\_DATE | Expiration date | DATE | Yyyy-mm-dd | Y |  |  |
|  | CUST\_ID | Customer identification number | INT, UNSIGNED | ##### | Y | FK | CUSTOMER |
| LOYALTY\_PROGRAM | CUST\_ID | Customer identification number | INT, UNSIGNED | ##### | Y | PK  FK | CUSTOMER |
|  | JOIN\_DATE | Date the customer applied for the program | DATE | Yyyy-mm-dd | Y |  |  |
|  | LP\_STATUS | Active or Inactive | VARCHAR(10) | Xxxxx | Y |  |  |
|  | POINTS | How much points the customer has gathered | INT | ### | Y |  |  |
|  | EXP\_DATE | The date the customer’s subscription ends | Date | Yyyy-mm-dd | Y |  |  |
| ZIP | ZIP\_CODE | Zip code of a person | INT, UNSIGNED | ##### | Y | PK |  |
|  | CITY | City of the zip | VARCHAR(50) | Xxxxx | Y |  |  |
|  | STATE | State of the zip | CHAR(2) | XX | Y |  |  |
| TAX | TAX\_ID | Tax identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | TAX\_RATE | Rate of the tax in decimal | DECIMAL(5, 4) | #.#### | Y |  |  |
|  | TAX\_NAME | Name of the tax | VARCHAR(25) | Xxxxx | Y |  |  |
| PAYMENT | PAY\_ID | Payment identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | PAY\_DATE | Date the payment was held | DATE | Yyyy-mm-dd | Y |  |  |
|  | PAY\_AMOUNT | Payment amount | DECIMAL(7, 2) | #####.## |  |  |  |
|  | PAY\_METHOD | Payment method | VARCHAR(20) | Xxxxx | Y |  |  |
|  | TAX\_ID | Tax identification number | INT, UNSIGNED | ##### | Y | FK | TAX |
|  | CUST\_CARD\_ID | Customer card identification number | INT, UNSIGNED | ##### | Y | FK | CUSTOMER\_CARD |
|  | ORDER\_ID | Order identification number | INT, UNSIGNED | ##### | Y | FK | PLACED\_ORDER |
| PLACED\_ORDER | ORDER\_ID | Order identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | ORDER\_DATE | Date the order is made | DATE | Yyyy-mm-dd |  |  |  |
|  | ORDER\_TIME | Tax identification number | TIME | ##:##:## | Y |  |  |
|  | CUST\_ID | Customer identification number | INT, UNSIGNED | ##### | Y | FK | CUST\_ID |
|  | ATTEND\_ID | Attendance identification number | INT, UNSIGNED | ##### | Y | FK | EMPLOYEE\_SHIFT |
| ORDER\_LINE | ORDER\_ID | Order identification number | INT, UNSIGNED | ##### | Y | PK FK | PLACED\_ORDER |
|  | PROD\_ID | Production identification number | INT, UNSIGNED | ##### | Y | PK FK | PRODUCT |
|  | QUANTITY | The quantity bought for each item | SMALLINT | ## | Y |  |  |
| PRODUCT | PROD\_ID | Production identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | PROD\_NAME | Name of the bakery item | VARCHAR(255) | Xxxxx | Y |  |  |
|  | PROD\_DESC | Description of the bakery item | VARCHAR(255) | Xxxxx | Y |  |  |
|  | PROD\_PRICE | Price of the bakery item | DECIMAL(5, 2) | ###.## | Y |  |  |
|  | PROD\_CATEGORY | Category of the bakery item | VARCHAR(15) | Xxxxx |  |  |  |
|  | PROD\_QTY | The amount of a bakery item available in customer’s view | SMALLINT | ## | Y |  |  |
|  | INVT\_ID | Inventor identification number | INT, UNSIGNED | ##### | Y | FK | INVENTORY |
|  | RECIPE\_ID | Recipe identification number | INT, UNSIGNED | ##### | Y | FK | RECIPE |
| INVENTORY | INVT\_ID | Inventory identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | INVT\_TYPE | Bakery item or ingredient or equipment | VARCHAR(20) | Xxxxx | Y |  |  |
|  | INVT\_QTY | Amount stored in inventory | SMALLINT | ### | Y |  |  |
|  | INVT\_EXP\_DATE | Expiration date | DATE | Yyyy-mm-dd |  |  |  |
|  | INVT\_MEASURE | Inventory measurement | VARCHAR(20) | xxxx |  |  |  |
|  | INVT\_MIN\_STOCK | Minimum allowed stock | SMALLINT | ## | Y |  |  |
|  | INVT\_MAX\_STOCK | Maximum allowed stock | SMALLINT | ### | Y |  |  |
|  | INVT\_STATUS | Available or not | VARCHAR(20) | Xxxxx | Y |  |  |
| INGREDIENT | INGRED\_ID | Ingredient identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | INGRED\_NAME | Name of the ingredient | VARCHAR(255) | Xxxxx | Y |  |  |
|  | INGRED\_QTY | Remaining quantity available | DECIMAL(5, 2) | ###.## | Y |  |  |
|  | INGRED\_MEASURE | Measurement used by the ingredient | VARCHAR(255) | Xxxxx |  |  |  |
|  | INVT\_ID | Inventor identification number | INT, UNSIGNED | ##### | Y | FK | INVENTORY |
|  | SUPP\_ID | Supplier identification number | INT, UNSIGNED | ##### | Y | FK | SUPPLIER |
| SUPPLIER | SUPP\_ID | Supplier identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | SUPP\_COMPANY | The company the supplier is affiliated to | VARCHAR(100) | Xxxxx | Y |  |  |
|  | SUPP\_ADDRESS | Address of the supplier | VARCHAR(255) | Xxxxx | Y |  |  |
|  | SUPP\_PHONE\_NUM | Phone # of the supplier | VARCHAR(255) | Xxxxx | Y |  |  |
|  | SUPP\_EMAIL | Email of the supplier | VARCHAR(255) | Xxxxx@xxxx.xxx | Y |  |  |
|  | ZIP\_CODE | Zip code | INT, UNSIGNED | ##### | Y | FK | ZIP |
| EQUIPMENT | EQUIP\_ID | Equipment identification number | INT, UNSIGNED | ##### | Y |  |  |
|  | EQUIP\_NAME | Name of the equipment | VARCHAR(255) | Xxxxx | Y |  |  |
|  | EQUIP\_TYPE | Type of the equipment | VARCHAR(255) | Xxxxx | Y |  |  |
|  | EQUIP\_MODEL | Model of the equipment | VARCHAR(255) | Xxxxx | Y |  |  |
|  | EQUIP\_MAKE | Make of the model | VARCHAR(255) | Xxxxx | Y |  |  |
|  | INVT\_ID | Inventor identification number | INT, UNSIGNED | ##### | Y | FK | INVENTORY |
|  | SUPP\_ID | Supplier identification number | INT, UNSIGNED | ##### | Y | FK | SUPPLIER |
| RECIPE | RECIPE\_ID | Recipe identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | RECIPE\_NAME | Name of the recipe | VARCHAR(255) | Xxxxx | Y |  |  |
|  | RECIPE\_DESC | Description of the recipe | VARCHAR(255) | Xxxxx | Y |  |  |
|  | DATE\_FOUND | Date the recipe is adopted | DATE | Yyyy-mm-dd | Y |  |  |
| RECIPE\_STEP | RECIPE\_STEP\_ID | Recipe step identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | RECIPE\_ID | Recipe identification number | INT, UNSIGNED | ##### | Y | FK | RECIPE |
|  | STEP\_NUM | Step number | SMALLINT | ## | Y |  |  |
|  | STEP\_DESCRIPTION | Description of the step. (Step 1, step 2) | VARCHAR(10000) | Xxxxx | Y |  |  |
| PRODUCT\_CREATION | CREATE\_ID | Recipe instruction identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | INGRED\_ID | Ingredient identification number | INT, UNSIGNED | ##### | Y | FK | INGREDIENT |
|  | PROD\_ID | Production identification number | INT, UNSIGNED | ##### | Y | FK | PRODUCT |
|  | RECIPE\_STEP\_ID | Recipe step identification number | INT, UNSIGNED | ##### | Y | FK | RECIPE\_STEP |
|  | DATE\_PERFORMED | Date the activity is performed | DATE | Yyyy-mm-dd | Y |  |  |
|  | EQUIP\_ID | Equipment identification number | INT, UNSIGNED | ##### |  | FK | EQUIPMENT |
| EMPLOYEE | EMP\_ID | Employee ID  NUM | INT, UNSIGNED | ##### | Y | PK |  |
|  | EMP\_FNAME | Employee First Name | VARCHAR(255) | Xxxxx | Y |  |  |
|  | EMP\_LNAME | Employee last name | VARCHAR(255) | Xxxxx | Y |  |  |
|  | EMP\_INITIAL | Employee middle name | CHAR(1) | X |  |  |  |
|  | EMP\_PHONE | Employee phone number | VARCHAR(255) | Xxxxx | Y |  |  |
|  | EMP\_EMAIL | Employee email | VARCHAR(255) | Xxxxx@xxxx.xxx | Y |  |  |
|  | EMP\_ADDRESS | Employee address | VARCHAR(255) | Xxxxx | Y |  |  |
|  | EMP\_HIRE\_DATE | Employee hire date | DATE | Yyyy-mm-dd | Y |  |  |
|  | ZIP\_CODE | Zip code | INT, UNSIGNED | ##### | Y | FK | ZIP |
|  | ROLE\_ID | Role identification number | INT, UNSIGNED | ##### | Y | FK | ROLE |
| SHIFT | SHIFT\_ID | Shift ID | INT, UNSIGNED | #### | Y | PK |  |
|  | SHIFT\_NAME | Name of shift(1st shift, 2nd shift, etc.) | VARCHAR(255) |  |  |  |  |
|  | START\_TIME | Time the shift starts | TIME | ##:##:## | Y |  |  |
|  | END\_TIME | Time the shift ends | TIME | ##:##:## | Y |  |  |
|  | BREAK\_TIME\_START | Time the break time begins for the shift | TIME | ##:##:## | Y |  |  |
|  | BREAK\_TIME\_END | Time the break time ends for the shift | TIME | ##:##:## | Y |  |  |
|  | DURATION | The duration, in hours, of the shift | SMALLINT | ## | Y |  |  |
| EMPLOYEE\_SHIFT | ATTEND\_ID | Attendance identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | SHIFT\_ID | Shift ID | INT, UNSIGNED | #### | Y | FK | SHIFT |
|  | EMP\_ID | Employee ID  NUM | INT, UNSIGNED | ##### | Y | FK | EMPLOYEE |
| INVOICE | INVOICE\_ID | Invoice identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | INVOICE\_DATE | Date of the invoice | DATE | Yyyy-mm-dd | Y |  |  |
|  | SUPP\_ID | Supplier identification number | INT, UNSIGNED | ##### | Y | FK | SUPPLIER |
|  | EXPENSE\_ID | Expense identification number | INT, UNSIGNED | ##### | Y | FK | EXPENSE |
| INVOICE\_LINE | INVOICE\_ID | Invoice identification number | INT, UNSIGNED | ##### | Y | PK  FK | INVOICE |
|  | INVT\_ID | Inventory identification number | INT, UNSIGNED | ##### | Y | PK  FK | INVENTORY |
|  | QUANTITY | The amount of items per invoice line | SMALLINT | ##### | Y |  |  |
| EXPENSE | EXPENSE\_ID | Expense identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | EXPENSE\_DATE | Date the expense is made | DATE | Yyyy-mm-dd | Y |  |  |
|  | EXPENSE\_CAT | Expense category | VARCHAR(50) | Xxxxx | Y |  |  |
|  | EXPENSE\_AMT | Amount the expense has | DECIMAL(15, 2) | #############.## | Y |  |  |
|  | TAX\_ID | Tax identification number | INT, UNSIGNED | ##### | Y | FK | TAX |
|  | COMP\_CARD | Company card identification number | INT, UNSIGNED | ##### | Y | FK | COMPANY\_CARD |
|  | DEPT\_ID | Department identification number | INT, UNSIGNED | ##### | Y | FK | DEPARTMENT |
| INVENTORY\_EXPENSE | EXPENSE\_ID | Expense identification number | INT, UNSIGNED | ##### | Y | PKFK | EXPENSE |
|  | INVT\_ID | Inventory identification number | INT, UNSIGNED | ##### | Y | PK  FK | INVENTORY |
|  | DATE\_INCURRED | Date the inventory expense is incurred | DATE | Yyyy-mm-dd | Y |  |  |
| TRAINING | TRAIN\_CODE | Training identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | TRAIN\_NAME | Name of the training | VARCHAR(255) | Xxxxx | Y |  |  |
|  | TRAIN\_DESC | Training description | MEDIUMTEXT | Xxxxx | Y |  |  |
|  | DURATION | Duration of the training in hours | DECIMAL(5, 2) | ###.## | Y |  |  |
| CERTIFICATION | CERT\_ID | Certification identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | CERT\_NAME | Certification name | VARCHAR(255) | Xxxxx | Y |  |  |
|  | RENEWAL\_PERIOD | Renewal period | SMALLINT | ## | Y |  |  |
|  | ISSUED\_BY | Name of the company not in this operation | VARCHAR(255) | Xxxxx |  |  |  |
|  | TRAIN\_CODE | Training identification number | INT, UNSIGNED | ##### | Y | FK | TRAINING |
| EMPLOYEE\_CERTIFICATION | EMP\_ID | Employee ID  NUM | INT, UNSIGNED | ##### | Y | PK  FK | EMPLOYEE |
|  | CERT\_ID | Certification identification number | INT, UNSIGNED | ##### | Y | PK  FK | CERTIFICATION |
|  | DATE\_RECEIVED | Date the certification is received | DATE | Yyyy-mm-dd | Y |  |  |
|  | VALID\_UNTIL | Validation date | DATE | Yyyy-mm-dd |  |  |  |
| EMPLOYEE\_TRAINING | EMP\_ID | Employee ID  NUM | INT, UNSIGNED | ##### | Y | PK  FK | EMPLOYEE |
|  | TRAIN\_CODE | Training identification number | INT, UNSIGNED | ##### | Y | PK  FK | TRAINING |
|  | DATE\_STARTED | Date the employee began their training | DATE | Yyyy-mm-dd | Y |  |  |
| DEPARTMENT | DEPT\_ID | Department identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | DEPT\_LOCATION | Department location within the building | VARCHAR(255) | Xxxxx | Y |  |  |
|  | DEPT\_NAME | Department name | VARCHAR(255) | Xxxxx | Y |  |  |
|  | DEPT\_TYPE | Department type | VARHCAR(255) | Xxxxx | Y |  |  |
| ROLE | ROLE\_ID | Role identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | ROLE\_NAME | Name of the role | VARCHAR(255) | Xxxxx | Y |  |  |
|  | ROLE\_DESC | Role description | VARCHAR(255) | Xxxxx | Y |  |  |
|  | SALARY\_ID | Salary identification number | INT, UNSIGNED | ##### | Y | FK | SALARY |
|  | DEPT\_ID | Department identification number | INT, UNSIGNED | ##### | Y | FK | DEPARTMENT |
| DEPARTMENT\_INVENTORY | INVT\_ID | Inventory identification number | INT, UNSIGNED | ##### | Y | PK  FK | INVENTORY |
|  | DEPT\_ID | Department identification number | INT, UNSIGNED | ##### | Y | PK  FK | DEPARTMENT |
|  | DATE\_ADDED | Date added to the department’s stash | DATE | Yyyy-mm-dd | Y |  |  |
|  | QUANTITY | Amount stored in department’s stash | SMALLINT | ## | Y |  |  |
| BUDGET | BUDGET\_ID | Budget identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | FISCAL\_YEAR | Fiscal year | SMALLINT | #### | Y |  |  |
|  | ALLOCATED\_AMT | Allocated amount | DECIMAL(10, 2) | ########.## | Y |  |  |
|  | REMAINING\_AMT | Remaining amount | DECIMAL(10, 2) | ########.## | Y |  |  |
|  | BUDGET\_STATUS | Current standing of the budget | VARCHAR(25) | Xxxxx | Y |  |  |
|  | DEPT\_ID | Department identification number | INT, UNSIGNED | ##### | Y | FK | DEPARTMENT |
| NUTRITIONAL\_INFO | PROD\_ID | Product identification number | INT, UNSIGNED | ##### | Y | PK  FK | PRODUCT |
|  | SERV\_SIZE | Serving size | VARCHAR(50) | Xxxxx | Y |  |  |
|  | CALORIES | Calories | DECIMAL(5, 2) | ###.## | Y |  |  |
|  | TOTAL\_FAT\_g | Total fat | DECIMAL(5, 2) | ###.## | Y |  |  |
|  | SAT\_FAT\_g | Saturated fat | DECIMAL(5, 2) | ###.## | Y |  |  |
|  | CHOLESTEROL\_mg | Cholesterol | DECIMAL(5, 2) | ###.## | Y |  |  |
|  | SODIUM\_mg | Sodium | DECIMAL(5, 2) | ###.## | Y |  |  |
| REVIEW | REV\_CODE | Review identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | REV\_FEEDBACK | Review feedback | VARCHAR(500) | ##### | Y |  |  |
|  | REV\_DATE | Review date | DATE | Yyyy-mm-dd | Y |  |  |
|  | REV\_TIME | Review time | TIME | ##:##:## | Y |  |  |
|  | CUST\_ID | Customer identification number | INT, UNSIGNED | ##### | Y | FK | CUSTOMER |
|  | PROD\_ID | Product identification number | INT, UNSIGNED | ##### | Y | FK | PRODUCT |
| RATING | RATING\_CODE | Rating identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | STAR\_RATING | Rating ranging from 0 to 5 | DECIMAL(2, 1) | #.# | Y |  |  |
|  | COMMENT | Comment about the product | VARCHAR(255) | Xxxxx |  |  |  |
|  | RATING\_DATE | Rating date | DATE | Yyyy-mm-dd | Y |  |  |
|  | RATING\_TIME | Rating time | TIME | ##:##:## | Y |  |  |
|  | CUST\_ID | Customer identification number | INT, UNSIGNED | ##### | Y | FK | CUSTOMER |
|  | PROD\_ID | Production identification number | INT, UNSIGNED | ##### | Y | FK | PRODUCT |
| PRODUCT\_ALLERGY | PROD\_ID | Production identification number | INT, UNSIGNED | ##### | Y | PK  FK | PRODUCT |
|  | ALLERGY\_ID | Allergy identification number | INT, UNSIGNED | ##### | Y | PK  FK | ALLERFY\_INFO |
|  | SEVERITY | Severity | VARCHAR(20) | Xxxxx | Y |  |  |
| ALLERGY\_INFO | ALLERGY\_ID | Allergy identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | ALLERGY\_NAME | Allergy name | VARCHAR(255) | Xxxxx | Y |  |  |
|  | ALLERGY\_DESC | Allergy description | VARCHAR(255) | Xxxxx | Y |  |  |
|  | PRECAUTION | Precaution or warning | TEXT | Xxxxx |  |  |  |
|  | HANDLING\_INST | Handling instruction | TEXT | Xxxxx | Y |  |  |
| PROMOTION | PROMO\_CODE | Promotion identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | PROMO\_NAME | Promotion name | VARCHAR(255) | Xxxxx | Y |  |  |
|  | PROMO\_TYPE | Promotion type | VARCHAR(50) | Xxxxx | Y |  |  |
|  | START\_DATE | Promotion start date | DATE | Yyyy-mm-dd | Y |  |  |
|  | END\_DATE | Promotion end date | DATE | Yyyy-mm-dd | Y |  |  |
|  | DISC\_CODE | Discount identification number | VARCHAR(25) | XXXXX | Y |  |  |
|  | DISC\_RATE | Discount rate | DECIMAL(3, 2) | ##.# | Y |  |  |
|  | LOYAL\_CUST\_RATE | Loyal discount rate | DECIMAL(3, 2) | ##.# |  |  |  |
| PRODUCT\_PROMOTION | PROD\_ID | Product identification number | INT, UNSIGNED | ##### | Y | PK  FK | PRODUCT |
|  | PROMO\_CODE | Promotion identification number | INT, UNSIGNED | ##### | Y | PK  FK | PROMOTION |
| PACKAGING | PACK\_ID | Package identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | PACK\_TYPE | Package type | VARCHAR(25) | Xxxxx | Y |  |  |
|  | PACK\_MATERIAL | Package material | VARCHAR(255) | Xxxxx | Y |  |  |
| PRODUCT\_PACKAGING | PROD\_PACK\_ID | Product package identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | PROD\_ID | Product identification number | INT, UNSIGNED | ##### | Y | FK | PRODUCT |
|  | PACK\_ID | Package identification number | INT, UNSIGNED | ##### | Y | FK | PACKAGING |
|  | PROD\_QTY | Product quantity in each package | SMALLINT | ##### | Y |  |  |
|  | PROD\_DATE | Date the package is made | DATE | Yyyy-mm-dd | Y |  |  |
|  | SUPP\_ID | Supplier identification number | INT, UNSIGNED | ##### | Y | FK | SUPPLIER |
| CUSTOMER\_CARD | CUST\_CARD\_ID | Customer card identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | CARD\_NUM | Customer card number | VARCHAR(16) | XXXXXXXXXXXXXXXX | Y |  |  |
|  | CARD\_FNAME | Customer card first name | VARCHAR(255) | Xxxxx | Y |  |  |
|  | CARD\_LNAME | Customer card last name | VARCHAR(255) | Xxxxx | Y |  |  |
|  | CARD\_INITIAL | Customer card initial | CHAR(1) | X |  |  |  |
|  | CARD\_BALANCE | Customer card balance | DECIMAL(20, 2) | ##################.## | Y |  |  |
|  | EXP\_DATE | Expiration date | DATE | Yyyy-mm-dd | Y |  |  |
|  | CARD\_ID | Card issuer identification number | INT, UNSIGNED | ##### | Y | FK | CARD\_ISSUER |
|  | CUST\_ID | Customer identification number | INT, UNSIGNED | ##### | Y | FK | CUSTOMER |
| CARD\_ISSUER | CARD\_ID | Card issuer identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | CARD\_TYPE | Card type | VARCHAR(25) | Xxxxx | Y |  |  |
|  | ISSUING\_BANK | Issuing bank | VARCHAR(255) | Xxxxx |  |  |  |
| SALES\_REPORT | REPORT\_ID | Report identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | PAY\_ID | Payment identification number | INT, UNSIGNED | ##### | Y | FK |  |
|  | DATE\_GENERATED | Date the payment was generated into sales | DATE | Yyyy-mm-dd | Y |  |  |
| SALARY | SALARY\_ID | Salary identification number | INT, UNSIGNED | ##### | Y |  |  |
|  | SALARY\_AMT | Salary amount | DECIMAL(8, 2) | ######.## | Y |  |  |
|  | EXPENSE\_ID | Expense identification number | INT, UNSIGNED | ##### | Y | FK | EXPENSE |
| WASTE\_LOG | INGRED\_ID | Ingredient identification number | INT, UNSIGNED | ##### | Y | PK  FK | INGREDIENT |
|  | INGRED\_DATE | Date the ingredient is used in production | DATE | Yyyy-mm-dd | Y | PK |  |
|  | WASTE\_QTY | Amount of waste recorded | DECIMAL(5, 2) | ###.## | Y |  |  |
|  | WASTE\_MEASURE | Waste measurement | VARCHAR(25) | xxxx |  |  |  |
|  | REASON | Reason for waste (e.g excess) | VARCHAR(25) | Xxxxx |  |  |  |
| EVENT | EVENT\_CODE | Event identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | EVENT\_NAME | Event name | VARCHAR(255) | Xxxxx | Y |  |  |
|  | EVENT\_DATE | Event date | DATE | Yyyy-mm-dd | Y |  |  |
|  | EVENT\_TYPE | Event type | VARCHAR(255) | Xxxx | Y |  |  |
|  | EVENT\_ADDRESS | Event address | VARCHAR(255) | Xxxxx | Y |  |  |
|  | EXPENSE\_ID | Expense identification number | INT, UNSIGNED | ##### | Y | FK | EXPENSE |
|  | ZIP\_CODE | Zip code of a person | INT, UNSIGNED | ##### | Y | FK | ZIP |
| CATERING | CATER\_CODE | Cater identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | CATER\_TYPE | Catering type | VARCHAR(255) | Xxxxx | Y |  |  |
|  | CATER\_REVENUE | Catering revenue | DECIMAL(10, 2) | ########.## | Y |  |  |
|  | EVENT\_CODE | Event identification number | INT, UNSIGNED | ##### | Y | FK | EVENT |
| CATERING\_PRODUCT | CATER\_CODE | Cater identification number | INT, UNSIGNED | ##### | Y | PK  FK | CATERING |
|  | PROD\_ID | Production identification number | INT, UNSIGNED | ##### | Y | PK | PRODUCT |
| CUSTOMER\_EVENT | EVENT\_CODE | Event identification number | INT, UNSIGNED | ##### | Y | PK  FK | EVENT |
|  | CUST\_ID | Customer identification number | INT, UNSIGNED | ##### | Y | PK  FK | CUSTOMER |
|  | RSVP | If customer attended (Y/N) | CHAR(1) | X |  |  |  |
|  | TIME | Time of attendance | TIME | ##:##:## |  |  |  |
| COMPANY\_CARD | COMP\_CARD | Company card identification number | INT, UNSIGNED | ##### | Y | PK |  |
|  | CARD\_NUM | Card number | VARCHAR(20) | Xxxxx | Y |  |  |
|  | BALANCE | Card balance | DECIMAL(20, 2) | ##################.## | Y |  |  |
|  | COMP\_CARD\_MONTH | Expiration month | SMALLINT | ## | Y |  |  |
|  | COMP\_CARD\_YEAR | Expiration year | SMALLINT | ## | Y |  |  |
|  | CARD\_ID | Card issuer identification number | INT, UNSIGNED | ##### | Y | FK | CARD\_ISSUER |

# Entity Relationship Diagram



# Table Creation Process

1. Ensure the ERD’s problems are minimized, since it’s possible for some hidden issues to remain.
2. Create an EXCEL file with each page pointing to a table from the ERD.
3. Started typing entity instances for each table with most being randomized through excel functions.
4. Made sure some composite key combinations do not duplicate since we are not working with an application that could put some constraints in this issue, assuming these data entries are in MySQL.
5. After the Excel file is done, we begin creating tables in our database, beginning with tables without foreign keys.
6. We used the data dictionary to identify the data types for each table attribute. Ran the command and ensure that the table exists. We referred to the schema on the left pane to identify that the data types we assigned to the table are indeed correct.
7. Opened an empty EXCEL file, copied one table content (specifically the table or entity we made the **CREATE TABLE** for) from our original EXCEL file, and pasted them to this empty EXCEL file. The reason behind this is because the MySQL import system only allows .csv files and .csv files only allow EXCEL files with a single page.
8. Saved this new file to our local PC and imported it to our database under “Use existing tables” and pointed to the table we created. Then ensured the names match and imported.
9. Foreign key resolution: one-to-many

A screenshot of a computer code

Description automatically generated

**ON UPDATE CASCADE** is for FKs only. This means that if we made changes to the entity being referenced, that change is automatically reflected to the entities associated with that referenced entity.

1. Foreign key resolution: many-to-many

A screenshot of a computer code

Description automatically generated

**ON DELETE CASCADE** is for FKs that are also PKs. This is common among dependent and associative entities. This means that the deletion of the referenced entity will also be reflected in these dependent entities. For example, If I were to delete an INVT\_ID of 123 in INVENTORY table, INVT\_ID of 123 in INVOICE\_LINE would also cease to exist.

The purpose of these cascades is to ensure real-time referential integrity.

1. Foreign key resolution: one-to-one

A close up of text

Description automatically generated

For entities that have one-to-one relation with another entity, and they are in charge of referencing the other table, we enforced a unique constraint to the FK attribute to ensure that there is no duplication of the same FK to other entity instances.

If not implemented, the relationship may end up as one-to-many which places logic error in our database.

# Database Reporting (MySQL Problems)

1. Customer Loyalty Analysis (Eman, Krupa, Maybelline)
   1. Query: Identify customers who have made more than 5 purchases and are not yet enrolled in the Loyalty Program.
   2. Entities Involved: CUSTOMER, ORDER, LOYALTY\_PROGRAM
2. Inventory Shortage Alert (**VICTOR**)
   1. Query: List all ingredients that are below the minimum stock level in the inventory.
   2. Entities Involved: INGREDIENT, INVENTORY
3. Employee Performance Metrics (Ronaldo)
   1. Query: Find the employee who has processed the most number of orders in the last month.
   2. Entities Involved: EMPLOYEE, ORDER, SHIFT
4. Supplier Expense Report (Eman, Krupa, Maybelline)
   1. Query: Generate a report showing the total expenses for each supplier in the last quarter.
   2. Entities Involved: SUPPLIER, INVOICE, EXPENSE
5. Product Review Insights (Krupa, Maybelline)
   1. Query: Identify the top 3 products with the highest and lowest average ratings.
   2. Entities Involved: PRODUCT, RATING
6. Promotion Effectiveness (Barry)
   1. Query: Calculate the increase in sales for products that were part of a promotion in the last month. (Pick the products involved in any promotion and were bought last month. Then calculate the total amount paid for each products. Meaning that a product can be in at least two promotions but still want the total sales for each product)
   2. Entities Involved: PRODUCT, PROMOTION, SALES\_REPORT (Optional)
7. Catering Revenue (Maybelline)
   1. Query: Summarize the total revenue generated from catering services for each event type.
   2. Entities Involved: CATERING, EVENT, INVOICE
8. Nutritional Information Compliance (Maybelline)
   1. Query: List all products that do not have updated nutritional and allergy information.
   2. Entities Involved: PRODUCT, NUTRITIONAL\_INFO, PRODUCT\_ALLERGY
9. Tax Collection Report (VICTOR)
   1. Query: Generate a monthly report showing the total tax collected, broken down by tax type.
   2. Entities Involved: TAX, PAYMENT, SALES\_REPORT
10. Employee Training Status (Ronaldo)
    1. Query: Identify employees who have not completed mandatory training.
    2. Entities Involved: EMPLOYEE, ROLE, TRAINING
11. Budget vs Expense Analysis (**ANGELO**)
    1. Query: Compare the actual expenses against the budget for each department for the current fiscal year.
    2. Entities Involved: EXPENSE, BUDGET, DEPARTMENT
12. Waste Management Metrics (**ANGELO**)
    1. Query: Find the top 5 ingredients that have the highest waste log entries in the past year.
    2. Entities Involved: INGREDIENT, WASTELOG, INVENTORY