Company X Food Delivery Database Case Scenario

# Basic Details

Customer orders from Restaurant

Customer can choose to Delivery or Pickup

If Delivery, order will be Assigned to a Rider.

Rider can choose to accept or decline an Order

Once Rider accepts Delivery Assignment, Customer is notified.

# Candidate Keys (Ranked in order of suitability)

Zone: ZoneID, ZoneName

Outlet: OutletID, Address, OutletName,

Customer: CustomerID, CustomerContact, Email

CustomerOrder: OrderID, OrdDateTime(??)

PickUp: RefNo(?)

Rider: RiderID, RiderContact

Delivery: Nil (?)

DeliveryAssignment: Nil

# Weak Entities/ Entities without a unique identifier

## Composite Keys

PickUp: OrderID(FK) + PkUpDateTime(Partial Key)

* PkUpDateTime is an attribute with repeated values and cannot uniquely identify the PickUp relation.
* However, since OrderID is unique, the PkUpDateTime can be used to tell when each specific order is being picked up, hence identifying the PickUp Relation

DeliveryAssignment: OrderID, RiderID, AssignStatus

* Tells us which OrderID assigned to which Rider and what is the Status of it

Delivery:

1. OrderID(FK) + DelDateTime(Partial Key) + RiderID(FK) – Can tell which rider is delivering which order at what time.
2. OrderID(FK) + DelDateTime(Partial Key) – Can see when each order is delivered
3. OrderID(FK) + RiderID(FK) – Can search for which rider is delivering which order

# Colour Legend

Yellow – Primary Key

Green – Foreign Key

# Restaurant Relations

## Zone Outlet

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | **ZoneID** | **ZoneName** | | N | North | | S | South | | E | East | | W | West | | |  |  |  |  |  | | --- | --- | --- | --- | --- | | **OutletID** | **OutletName** | **Address** | **ZoneID** | **DelFee** | | 1347 | Curry Season | #01-01, King’s Square | S | 3.50 | | 5982 | Heidilau | #02-05, Golden Tower | E | 5.00 | | 1859 | Burger Wang | #01-38, United Mall | W | 4.20 | | … | … | … | … | … | |

# Customer Relations

## Customer

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CustID** | **CustName** | **Email** | **CustContact** | **CustAddress** |
| 1107A | Emily Tan | Emtan@gmail.com | 88125890 | #15-03, Blk 3, Sunrise Way |
| 1926R | Peter Lee | Plee@hotmail.com | 90902742 | 90B, Hendy Road |
| 2865G | Cha Jie Lun | Jielun@gmail.com | 32329099 | 112, Vista Rise |
| 4927A | Daisy Lim | Dasyl@gmail.com | 87783512 | #25-03, Blk D, Ocean Lane |
| … | … | … | … | … |

## CustomerOrder

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **OrderID** | **OrdDateTime** | **OrdStatus** | **CustID** | **OutletID** |
| WS23 | 09/01/2022 08:02:00 | Completed | 4927A | 1859 |
| DD67 | 17/02/2022 13:30:00 | Completed | 1926R | 2279 |
| TM88 | 27/03/2022 12:18:00 | Cancelled | 5750G | 1927 |
| PA20 | 03/04/2022 15:18:00 | Completed | 3961M | 1347 |
| … | … | … | … | … |

* OrdStatus shows the status of an order from the time it is placed until delivery is completed. OrdStatus values are “Pending confirmation”, “In the kitchen”, “Rider on the way”, “Out for delivery”, “Completed” and “Cancelled”.

## PickUp

|  |  |  |
| --- | --- | --- |
| **OrderID** | **PkupDateTime** | **RefNo** |
| SH21 | 02/02/2022  10:15:00 | XPP3 |
| AK73 | 13/12/2022  14:30:00 | LP24 |
| PA20 | 03/04/2022  16:25:00 | KY99 |
| … | … | … |

* A reference number is a unique identifier assigned to any financial transaction including those made using a credit or debit card.
* Must assume that : there is a period of time where you can switch between pickup and delivery

# Rider Relations

## Rider

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **RiderID** | **RiderName** | **RiderContact** | **RiderAddress** | **DOB** | **Del Mode** |
| 102 | Lim Ah Beng | 90991532 | 25, Swee Chin Lane | 23/12/1978 | Car |
| 189 | Jackson Wong | 89897521 | 14, Mulberry Way | 03/09/1999 | Bicycle |
| 233 | Ong Teck Meng | 27891654 | #11-18, Blk 7, Hibie Road | 08/03/1982 | Scooter |
| 270 | Alfie Sim | 77541442 | #12-04, Blk 6, River Way | 15/06/1970 | Car |
| … | … | … | … | … | … |

## DeliveryAssignment

|  |  |  |
| --- | --- | --- |
| **OrderID** | **RiderID** | **AssignStatus** |
| WS23 | 102 | Completed |
| DD67 | 451 | Declined |
| DD67 | 189 | Completed |
| TM88 | 117 | Cancelled |
| QM58 | 517 | Assigned |
| AK73 | 189 | Accepted |
| … | … | … |

* AssignStatus shows the status of an order assigned to riders. The values for AssignStatus are “Assigned”, “Accepted”, “Declined”, “Completed” and “Cancelled

Delivery

|  |  |  |  |
| --- | --- | --- | --- |
| **OrderID** | **DelDateTime** | **DelAddress** | **RiderID** |
| WS23 | 09/01/2022  09:15:00 | #25-03, Blk D,  Ocean Lane | 102 |
| DD67 | 17/02/2022  14:35:00 | 3A, Shen Yang  Road | 189 |
| QM58 | 14/03/2022  15:45:00 | #01-04, Blk 5,  Emerald Rise | 517 |
| … | … | … | … |

-only if delivery is accepted then move here

Rider is assigned a delivery by DeliveryAssignment.

If Rider accepts the delivery assigned to them,

DeliveryAssignment assigns a Delivery to a Rider.

# Relational Theory

## Definitions of Terms & their Implications

* Database: Shared collection of logically related data
  + Use: repository of data used simultaneously by different users
* Database Management System (DBMS) : Enables interaction between a database and application
  + Stores data from application into database
  + E.g. Login portal (Application) stores login information(Name, MemberID…) into the Database
* Relation: 2D table with *fixed no. of cols* and *any no. of rows* , *unique within a database*
* Attributes: Col of a relation, *unique within a relation, stores 1 value*
* Degree: No. of attributes in a relation
* Tuple: Row of a relation, each tuple is *unique* as it always has a *primary key*
* Cardinality: No. of records or rows in a relation
* Domain: Set of allowable attributes in a relation
  + E.g., Gender: M or F

## Keys

1. Candidate Key
   1. Attributes that *uniquely identify each tuple* in a relation
      1. A person’s name cannot be chosen as a primary and candidate key
2. Primary Key
   1. Candidate key chosen to uniquely identify each tuple, 1 primary key in 1 relation
3. Alternate Key
   1. Candidate keys not chosen as primary key
4. Foreign Key
   1. Primary key from another relation
   2. Used to form a relationship with another relation in the same database
5. Composite Key
   1. Consists of more than 1 attribute

Concept of NULL

* Unknown or unavailable value
* Not zero or empty string spaces

# Violations

Entity Integrity

* Primary Key cannot be NULL and must be Unique

Referential Integrity

* Foreign Key must be NULL OR its value must match the Primary Key in another relation.
* Graphical user interface, application

  Description automatically generated

# SQL Statements

## Creating Tables & Constraints

1. Figure 2(a) is the Data Dictionary for the DiscJockey relation. Write the SQL code to create the table in the database, including the necessary constraints. You may assume that the Channel Relation has been created.

## Inserting, Updating and Deleting a Row

1. The room which channel “Double Three” normally uses to air its programmes is being renovated. The channel is now moved to room B02-33. Write the SQL code to reflect this change in the database.
2. A new disc jockey, Irine Soh (ID = ‘Dj006’), has been hired to anchor a new Mandarin channel called “Nine Three Hundred” (ID = ‘9300’) which will be launched soon. It will be using room B02-03 to air its programmes. Write the SQL code to include this new information in the database.

## Displaying and Sorting

1. Write the SQL code to list the details of all programmes that are scheduled to be aired in August 2009. Display the list according to the alphabetical order of the programme titles. You are required to provide 2 versions, one using DATE function and one without the use of DATE function.
2. The programme director wants to know which female disc jockey has a role as a ‘Lead presenter’. Write the SQL code to list the details of these disc jockeys together with their programme numbers.