**INFO 6210 SEC 01 - DATA MANAGEMENT AND DATABASE DESIGN**

**SUMMER 2020**

**P2. DATABASE DESIGN AND INITIAL ENTITY RELATIONSHIP DIAGRAM**

**DUE: 06/11/2020, 11:59PM**

**PROJECT TEAM 10**

**TEAM MEMBERS**

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**Database Topic:**

Retail Store Management

**Mission Statement:**

The purpose of our database is to maintain and store data which is used to facilitate data analysis in order to attain efficiency in inventory control, sales, timely deliveries and customer satisfaction

**Business Problems Addressed:**

* Storage and management of data related to orders, sales and delivery
* Attain efficiency in inventory control
* Timely delivery needs to be ensured
* Customer satisfaction should be attained

**Business Rules:**

* One branch may have one or many employees
* One branch may have many customers
* One branch may have one or many products
* One customer may be part of 0 or many branches
* One customer may place one or many orders
* One or many customers may place an order for delivery
* One supplier may supply 0 or many products
* One product can be a part of 0 or many orders
* One product may be a part of 0 or many branches
* One branch\_product is related to 0 or many sales
* One delivery\_personnel may do 0 or many deliveries
* One delivery\_order may be a part of only one delivery
* One delivery\_order may be a part of one or many customers
* One delivery\_order may have 0 or many products
* One or many delivery\_order may have one delivery\_location
* One order may have one or many products
* One or many orders may be placed by one customer
* One delivery\_location may be part of one or many delivery\_order
* Customer\_feedback is related to orders and delivery\_order
* Delivery fee is charged till a certain amount
* Delivery of order is allowed till a particular distance

**Design Requirements:**

* Establish relationships between each entity.
* Use crow’s foot notation in order to specify multiplicity
* Identify and specify the primary key fields in each entity to uniquely identify each record in a particular entity.
* Drawing lines between tables to establish a relationship between them.
* The lines may specify either identifying relationships (solid lines) or non-identifying relationships(dotted lines)
* Specify which table is on the one side of the relationship by placing one next to the field where the line starts.
* Specify which table is on the many sides of the relationship by placing a crow’s foot symbol next to the field where the line ends.

**Design Decisions:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Entity NO.** | **Entity Name** | **Why entity included** | **How entity is related to other entities** |
| **1** | **employee** | Keeps track of all employees involved in the retail management system. The attributes are employee\_id, branch\_id, first\_name , last\_name, type | Each employee belongs to at least 1 branch, where branch is an entity which has branch\_id and branch\_name as its attributes.  Multiple employees belongs to one branch |
| **2** | **branch** | Keeps track of all the branches in the retail management systems. The attributes are branch\_id, branch\_name, location\_id. | Each branch in the system is related to multiple entities.  Branch has many customers  Branch has many products  Branch has many employees  Each branch has 1 location |
| **3** | **branch\_product** | This is an associative entity. It keeps track of which product is present in which branch.  The branch\_product helps in solving many to many relationships between branch and product.  The attributes included are branch\_product\_id, branch\_id, product\_id, selling\_price, stock | Branch\_product is related to product, branch, sales and order\_product.  A branch\_product contains many branches.  A branch\_product contains many products  Many branch\_product belongs to 1 sale  A branch\_product belongs to many order\_products |
| **4** | **branch\_customer** | This is an associative entity. It keeps track of branches and customers..  The branch\_customer helps in solving many to many relationships between branch and customer.  The attributes included are branch\_id, customer\_id and branch\_customer\_id. | Branch\_customer is related to branch and customer entity  Branch has many customers  A customer goes to many branches |
| **5** | **product** | Keeps a track of all the products of the retail management system. The attributes are product\_id, supplier\_id, product\_name, cost\_price, product\_discount, discount\_on\_quantity and supplier\_intake | A product is related to supplier and branch\_product.  A supplier may supply 0 or many products  A product can be part of multiple branch\_products |
| **6** | **customer** | One of the most important entities in the retail management system. Keep track of all customers who make purchases. The attributes are customer\_id, customer\_discount, first\_name, last\_name, customer\_type. | A customer is related to branch, order and delivery\_order  A customer is goes to multiple branches  A customer places to multiple orders  A customer places multiple delivery\_orders. |
| **7** | **supplier** | Keeps track of all the suppliers in the retail management system. A supplier is an entity that supplies goods and services to another organization.  The attributes are supplier\_id and supplier\_name | A supplier may supply either 0 or many products |
| **8** | **order** | Keeps track of all the orders made by customers in the system. The attributes are order\_id, customer\_id, order\_date, order\_type, total\_price and customer\_discounted\_total\_price | Order is related to order\_branch\_product, customer and customer\_feedback.  1 or more order can be placed by only 1 customer.  An order contains 1 or more order\_branch\_product  An order contains to 0 or 1 customer\_feedback |
| **9** | **order\_branch\_product** | This is an associative entity which keeps track of the products that are added to a particular order and delivery\_order. The attributes are order\_branch\_product\_id, product\_id, order\_id, quantity, discounted\_cost\_price | Order\_branch\_product is related to order, delivery\_order, branch\_product and sales.  Multiple order\_branch\_product belongs to 1 order  Multiple order\_branch\_product belongs to 1 delivery\_order  One branch\_product can be part of multiple order\_branch\_product  Multiple order\_branch\_product contribute to 1 sale. |
| **10** | **delivery\_order** | For keeping track of all the orders that are going out for delivery.  The attributes are delivery\_order\_id, customer\_id, delivery\_location\_id, estimated\_time, total\_price, delivery\_fee, customer\_discounter\_total\_price | Delivery\_order is related to customer, order\_branch\_product, customer\_feedback, location and delivery  Multiple delivery\_orders can be placed by one customer.  1 delivery\_order contains 1 or more order\_branch\_product  1 delivery order contains 1 customer feedback  A delivery\_order has a location  1 delivery\_order is delivered once |
| **11** | **delivery\_personnel** | This entity keeps track of information regarding all delivery personnel involved in the system. The attributes are delivery\_personnel\_id, availability, first\_name and last\_name. | A delivery person is related to the delivery entity.  A delivery person can make either 0 or many deliveries. |
| **12** | **location** | This entity would help us keep track of all the locations that are involved in the system.  This would include the branch location and the delivery location  The attributes included are location\_id, street\_address, house\_no, area and zip\_code | Location is related to branch and delivery\_order  A location can have 1 or many delivery\_order  A location can be associated with one and only one branch |
| **13** | **customer\_feedback** | This entity is used to calculate the customer’s satisfaction of the overall retail store services. The attributes are customer\_feedback\_id, order\_id, timely\_delivery, stock\_availability, quality, employee\_response, cleanliness and customer\_satisfaction | Customer\_feedback is related to order and delivery\_order.  Customer\_feedback would be based on particular order.  Customer\_feedback would also be based on a particular delivery\_order |
| **14** | **sale** | This entity is used to calculate the overall sales of the retail store based on each order placed, and in turn calculates the sales profit. The attributes included are sale\_id, branch\_product\_id, order\_branch\_product\_id, sale\_quantity, sale\_profit | Sale is related to order\_branch\_product and branch\_product.  A Sale would be calculated based on one or more branch\_product.  A Sale would also be calculated based on one or more order\_branch\_product. |
| **15** | **delivery** | Keeps track of all deliveries that are made from the retail store for customers who had opted for the delivery option. The attributes included are delivery\_order\_id, delivery\_personnel\_id, start\_time, end\_time, completion | Delivery is related to delivery\_personnel and delivery\_order  Delivery is related to 1 and only 1 delivery\_order  Many deliveries can be made by 1 delivery personnel |