**Let’s create the scenario of the given data model.**

1. **Identify entities**

customers,client, name, address, phone, email, item, price,cost, amount, store, description, tax, total, article, item and date of sale are all possible nouns that we can find from that case. name, address, phone, email depend on customer; and tax, total, and date of sale depend on sale; description, price, and cost can depend of item. So customers, store, item, clients, sales, articles are independent, they are eligible to be set of entities.

|  |  |
| --- | --- |
| **No** | **Entity** |
| 1 | Customer |
| 2 | Stores |
| 3 | Items |
| 4 | Clients |
| 5 | Sales |
| 6 | Articles |

1. **Remove duplicate entities**

To avoid duplicate entities we should find the synonyms and keep those best appropriate to our model system. Customers, stores, Items, sales are best to choose. Moreover, they are strong entities because they are independent (). The final result is:

|  |  |  |
| --- | --- | --- |
| NO | ENTITY SET | TYPE |
| 1 | Customer | strong |
| 2 | Sales | strong |
| 3 | Store | strong |
| 4 | Item | strong |

1. **Let define the attributes**

**- Customer**

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE NAME | TYPE | DOMAIN | OPTIONAL |
| CustomerId | Unique identifier | Text | none |
| FirstName | Composite attribute | Text | none |
| LastName | Composite attribute | text | none |
| Address | Composite attribute | Text | none |
| Phone | Multi-valued attribute | Text | none |
| Email | Single-valued attribute | Text | Yes |

- **Store**

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE NAME | TYPE | DOMAIN | OPTIONAL |
| SotoreId | Unique identifier | Text | none |
| Name | Single-valued attribute | Text | none |
| Phone | Multi-valued attribute | Text | none |
| Email | Single-valued attribute | Text | Yes |

**- Item**

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE NAME | TYPE | DOMAIN | OPTIONAL |
| ItemId | Unique identifier | Text | none |
| Description | Single-valued attribute | Text | none |
| Cost | Single-valued attribute | Text | none |

1. **Let define the relationship set**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Relationship set** | **identifying** | **Left veb** | **Right verb** | **cardinality** | **optionality** |
| CUSTOMER -> SALE | no | buys | Sold to | Many- to-many | may |
| SALE-> STORE | no | sells | Sold by | Many to many | may |

We should split all the many yo many relationships to one to many because many to many is not acceptable in relational data model.

**- sell item**

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE NAME | TYPE | DOMAIN | OPTIONAL |
| SellId | Unique identifier | Text | none |
| SellItemId | Unique identifier | Text | none |
| ItemPrice | Single-valued attribute | Text | none |

**- Business rule**

1. Data can be changed by only administrator
2. A sale item cannot be created without a sale and a item.
3. The sale date must be registered automatically.
4. An email can be sent to customer when a new items are available in the store if the customer has an email.