East West University
Department of Computer Science and Engineering

CSE 301: LAB 06 [Assessed Lab]
Course Instructor: Dr. Mohammad Rezwanul Huq

# E-R Modeling using Data Modeler in SQLDeveloper

## Lab Objective

Familiarize students with Entity-Relationship Model.

## Lab Outcome

After completing this lab successfully, students will be able to:

1. **Understand** E-R Model.
2. **Understand and use** Data Modeler tool for E-R modeling.

## Psychomotor Learning Levels

This lab involves activities that encompass the following learning levels in psychomotor domain.

| Level | Category | Meaning | Keywords |
|---|---|---|---|
| P1 | Imitation | Copy action of another; observe and replicate. | Relate, Repeat, Choose, Copy, Follow, Show, Identify, Isolate. |
| P2 | Manipulation | Reproduce activity from instruction or memory | Copy, response, trace, Show, Start, Perform, Execute, Recreate. |

## Instructions

- Follow the instructor during the class.
- A simple step-by-step tutorial is uploaded in this link. https://www.dropbox.com/s/23df92vgnymx33c/Data%20Modeler%20Tutorial.pdf?dl=0

## Practice Exercise

### Step 1: Add the following domains.

| Name | Logical Type | Other Information |
|---|---|---|
| Person Name | VARCHAR | Size: 25 |
| Address Line | VARCHAR | Size: 40 |
| City | VARCHAR | Size: 25 |
| State | VARCHAR | Size: 2 |
| Zip | VARCHAR | Size: 10 |
| Book Id | VARCHAR | Size: 20 |
| Numeric Id | NUMERIC | Precision: 7, Scale: 0 |
| Title | VARCHAR | Size: 50 |

### Step 2: Creating the Books Entity Set

| Name | Datatype | Other Information and Notes |
|---|---|---|
| book_id | Domain: Book Id | Primary UID (unique identifier). (The Dewey code or other book identifier.) |
| title | Domain: Title | M (mandatory, that is, must not be null). |
| author_last_name | Domain: Person Name | M (mandatory, that is, must not be null). |
| author_first_name | Domain: Person Name | 25 characters maximum. |
| rating | Logical type: NUMERIC (Precision=2, Scale= 0) | (Librarian's personal rating of the book, from 1 (poor) to 10 (great).) |

### Step 3: Creating the Patrons Entity

| Attribute Name | Type | Other Information and Notes |
|---|---|---|
| patron_id | Domain: Numeric Id | Primary UID (unique identifier). (Unique patron ID number, also called the library card number.) |
| last_name | Domain: Person Name | M (mandatory, that is, must not be null). 25 characters maximum. |
| first_name | Domain: Person Name | (Patron's first name.) |
| street_address | Domain: Address Line | (Patron's street address.) |
| city | Domain: City | (City or town where the patron lives.) |
| state | Domain: State | (2-letter code for the state where the patron lives.) |
| zip | Domain: Zip | (Postal code where the patron lives.) |
| location | Structured type: SDO_GEOMETRY | Oracle Spatial geometry object representing the patron's geocoded address. |

### Step 4: Creating the Transactions Entity

| Attribute Name | Type | Other Information and Notes |
|---|---|---|
| transaction_id | Domain: Numeric Id | Primary UID (unique identifier). (Unique transaction ID number) |
| patron_id | Domain: Numeric Id | M (mandatory, that is, must not be null). Must match a patron_id value in the Patrons entity. |
| book_id | Domain: Book Id | M (mandatory, that is, must not be null). Must match a book_id value in the Books entity. |
| transaction_date | Logical type: Datetime | M (mandatory, that is, must not be null). Date and time of the transaction. |
| transaction_type | Domain: Numeric Id | M (mandatory, that is, must not be null). (Numeric code indicating the type of transaction, such as 1 for checking out a book.) |

### Step 5: Creating Relations between Entities

- Books and Transactions: one-to-many. Each book can be involved in multiple sequential transactions. Each book can have zero or one active checkout transactions; a book that is checked out cannot be checked out again until after it has been returned.
- Patrons and Transactions: one-to-many. Each patron can be involved in multiple sequential and simultaneous transactions. Each patron can check out one or many books in a visit to the library and can have multiple active checkout transactions reflecting several visits; each patron can also return checked out books at any time.

### Step 6: Save the Design

### Step 7: Develop the Relational Model (Schema Diagram)

### Step 8: Generate DDL and Save the script