# **Relational Mapping – Tutorial 2.2**

Introduction

**Purpose:** This tutorial aims to help you develop the skills required for mapping conceptual model diagrams (specifically ER diagrams) into a relational schema. You will additionally learn how to evaluate different mapping choices which could be made for one ER diagram.

**Learning Outcomes:** By the end of this tutorial, you will be able to:

* Create relation schemas from ER and EER diagrams
* Understand the role foreign keys play in the mapping process
* Develop critical thinking skills to make effective decisions during the mapping process
* Understand the role of mapping in database design

# Section A: Basic Mapping

Create relational mappings for the following ER Diagrams. Note: All foreign keys between tables must be stated. Each question may have several correct answers.

## A.1

CAR[VehicleID,State,Number,Year,Model,Make]  
CAR\_COLOUR[VehicleID,Colour]

* CAR\_COLOUR.VehicleID references CAR.VehicleID

**A.2**

ATHLETE[ID,Name,Sex,Age,Country]  
EVENT[ID,Name,Category,VenueID]

* EVENT.VenueID references VENUE.ID

VENUE[ID,Name,Address]  
PARTICIPATES[AthleteID,EventID,Placement]

* PARTICIPATES.AthleteID references ATHLETE.ID
* PARTICIPATES.EventID references EVENT.ID

Section B: Advanced Mapping

Create relational mappings for the following ER Diagrams. Note: All foreign keys between tables must be stated.

## B.1

## 

DOCTOR[Lic\_no,d]  
GP[Lic\_no]

* GP.Lic\_no references DOCTOR.Lic\_no

SPECIALIST[Lic\_no,Specialisation]

* SPECIALIST.Lic\_no references DOCTOR.Lic\_no

PATIENT[Pid]  
CLINIC[Rno]  
APPOINTMENT[Lic\_no,Pid,DateTime,Fee]

* APPOINTMENT.Lic\_no references DOCTOR.Lic\_no
* APPOINTMENT.Pid references PATIENT.Pid

WORKS\_IN[Lic\_no,Rno]

* WORKS\_IN.Lic\_no references DOCTOR.Lic\_no
* WORKS\_IN.Rno references CLINIC.Rno

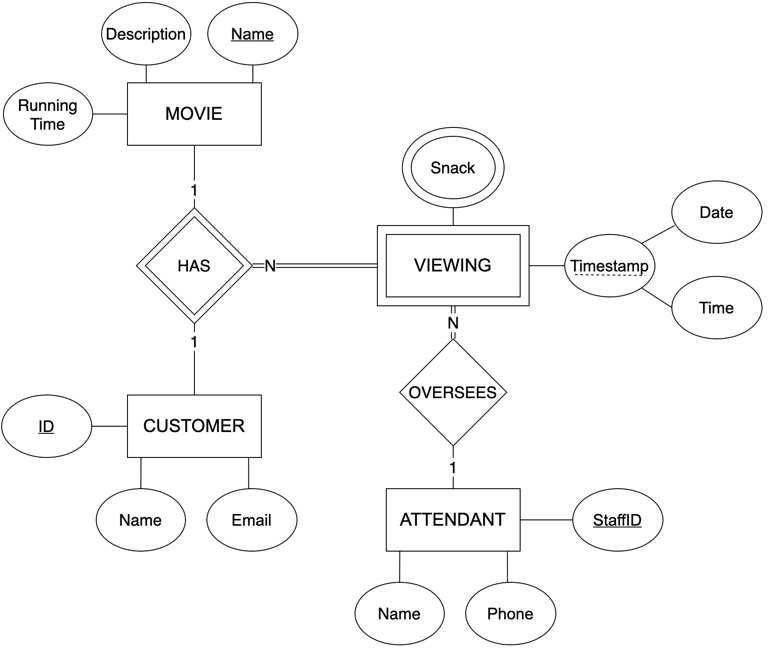
**B.2**



STUDENT[ID,Name,HopesAndDreams]  
COURSE[Code,Year,Semester,Level]  
LECTURER[Name,Qualification]  
TAKES[Student\_ID,Course\_Code,Lecturer\_Name]

* TAKES.Student\_ID references STUDENT.ID
* TAKES.Course\_Code references COURSE.Code
* TAKES.Lecturer\_Name references LECTURER.Name

**B.3**



MOVIE[Name,Description,Running\_Time]  
CUSTOMER[ID,Name,Email]  
VIEWING[Movie\_Name,Customer\_ID,Date,Time,StaffID]

* VIEWING.Movie\_Name references MOVIE.Name
* VIEWING.Customer\_ID references CUSTOMER.ID
* VIEWING.StaffID references ATTENDANT.StaffID

VIEWING\_SNACK[Movie\_Name,Customer\_ID,Date,Time,Snack]

* VIEWING\_SNACK.(Movie\_Name, Customer\_ID, Date, Time) references VIEWING

ATTENDANT[StaffID,Name,Phone]

**B.4**



BANK[Code,Name,Address]  
BRANCH[Bank\_Code,Bank\_Name,Number,Address]

* BRANCH.(Bank\_Code, Bank\_Name) references BANK(Code, Name)

LOAN[Number,Type,Amount,Bank\_Code,Bank\_Name,Branch\_Number]

* LOAN.(Bank\_Code, Bank\_Name, Branch\_Number) references BRANCH(Bank\_Code, Bank\_Name, Number)

ACCOUNT[Number,Type,Balance,Bank\_Code,Bank\_Name,Branch\_Number]

* ACCOUNT.(Bank\_Code, Bank\_Name, Branch\_Number) references BRANCH(Bank\_Code, Bank\_Name, Number)

CUSTOMER[ID,Name,Address,Phone]  
CUSTOMER\_LOAN[Customer\_ID,Loan\_Number]

* CUSTOMER\_LOAN.Customer\_ID references CUSTOMER.ID
* CUSTOMER\_LOAN.Loan\_Number references LOAN.Number

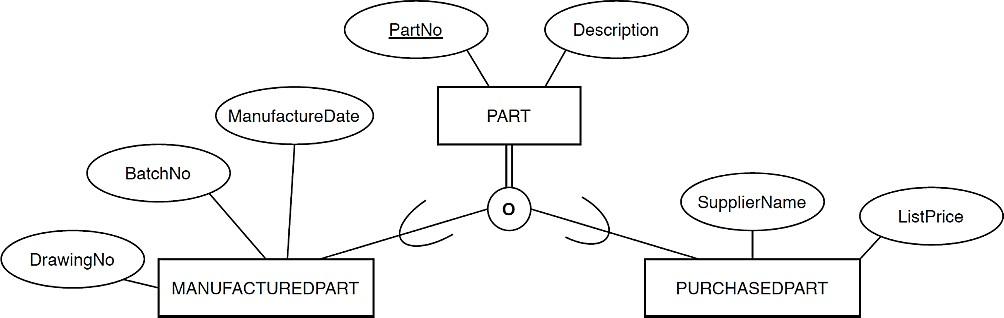
CUSTOMER\_ACCOUNT[Customer\_ID,Account\_Number]

* CUSTOMER\_ACCOUNT.Customer\_ID references CUSTOMER.ID
* CUSTOMER\_ACCOUNT.Account\_Number references ACCOUNT.Number

Section C: Extended Entity Relationship Diagram Mapping

Create relational mappings for the following EER Diagrams. Note: All foreign keys between tables must be stated. When mapping subclasses, please remember that there may be several correct ways. Using your intuition, try to select the most appropriate mapping method. Consult with your tutor if your answer differs from the sample solution.

## C.1



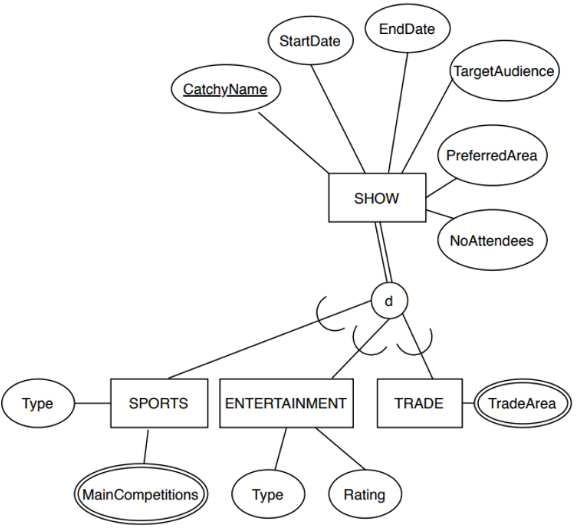
PART[PartNo,Description]  
MANUFACTURED\_PART[PartNo,ManufactureDate,BatchNo,DrawingNo]

* MANUFACTURED\_PART.PartNo references PART.PartNo

PURCHASED\_PART[PartNo,SupplierName,ListPrice]

* PURCHASED\_PART.PartNo references PART.PartNo

**C.2**



SHOW[CatchyName,StartDate,EndDate,TargetAudience,PreferredArea,NoAttendees]  
SPORTS[CatchyName,Type]

* SPORTS.CatchyName references SHOW.CatchyName

SPORTS\_MAIN\_COMPETITIONS[CatchyName,MainCompetition]

* SPORTS\_MAIN\_COMPETITIONS.CatchyName references SPORTS.CatchyName

ENTERTAINMENT[CatchyName,Type,Rating]

* ENTERTAINMENT.CatchyName references SHOW.CatchyName

TRADE[CatchyName]

* TRADE.CatchyName references SHOW.CatchyName

TRADE\_TRADEAREA[CatchyName,TradeArea]

* TRADE\_TRADEAREA.CatchyName references TRADE.CatchyName