Databases	Day **2**
	2 hours
TUTORIAL 3 **Introduction to ER Modelling**	

Learning Objectives

- Learn the formal notations used in ER modeling
- Learn the importance of identifying relationships for DB modeling
- Learn to determine whether certain relationships are to be modeled

ACTIVITIES

Task 1 – Identify and draw the formal notations used in ER Modelling

The commonly used objects in ER (Entity Relationship) Modelling are:

(i) Entity (represents a set or collection of objects that share the same properties)

(ii) Attribute (represents the properties of an entity)

(iii) Relationship (represents the association between participating entities)

(a) **Draw the notation for each of the above modelling objects:**

Entity	Attribute	Relationship

(b) **Computers sold by Zappel Machines have the following attributes as shown in the table. Illustrate how this will be modelled**.

Serial No	PC-003-ZBR-019
Model No	Zappel-Star-ZS1
Processor	Intel Core i7-5500U
Processor Speed	2.4 Ghz
Memory Ram	8 GB
Display	15”
Storage Device (HDD)	500GB
Operating Systems	Windows 10

(c) 3 new computer labs will be setup in rooms 31-6-1, 31-6-2 and 31-6-3 of the School. Due to physical space constraints, the labs will be of different sizes (length and breadth). Depending on the seating capacity of the lab, there will be 20-22 computers in each lab. While the computers will be purchased from Zappel Machines, the specs of the computers may differ from machine to machine. Details of the labs and the computers in each lab are provided in the table below. Draw the ER model to model the data relating to the labs and the computers in the labs.

Rm_No	Length	Breadth	Capacity	SNo	Model	Processor	Speed	Mem	Display	Storage	OS
31-6-1	30	50	20	X01 : : : Z20	xxx : : : zzz	xxxx : : : zzz	xxxx : : : zzz	xxxx : : : zzz	xxxx : : : zzz	xxxx : : : zzz	xx : : : zz
31-6-2	40	50	22	P01 : : : P22	xxx : : : zzz	xxxx : : : zzz	xxxx : : : zzz	xxxx : : : zzz	xxxx : : : zzz	xxxx : : : zzz	xx : : : zz
31-6-3	35	60	21	S01 : : : S21	xxx : : : zzz	xxxx : : : zzz	xxxx : : : zzz	xxxx : : : zzz	xxxx : : : zzz	xxxx : : : zzz	xx : : : zz

Task 2 – Identify the various forms of Relationships in ER Modelling

Typically, relationship between 2 entities may be:

(i) one-to-one (1:1)
(ii) one-to-many (1:M)
(iii) many-to-many (M:N)

Given the following scenarios, identify the nature of relationships and draw the ER model to represent these relationships. To keep the model simple, there is no need to attach attributes to the entities.

(a) In a polytechnic, students are enrolled for several modules each semester. A module will typically have a cohort of at least a hundred students enrolled for it. Model this relationship. Is it 1:1, 1:M or M:N? Explain.

(b) Every student who enrolled in the Polytechnic is assigned a mentor for the full duration of his study. Model the relationship between the students and the mentor. Assume that the mentor does not change during the entire period of study of the student.

(c) Supposed in (b) above, when a mentor leaves the Polytechnic, a new mentor is assigned to the students. Model the relationship between the students and the mentor if the Polytechnic would like to track the mentors who has ever been assigned to a particular student.

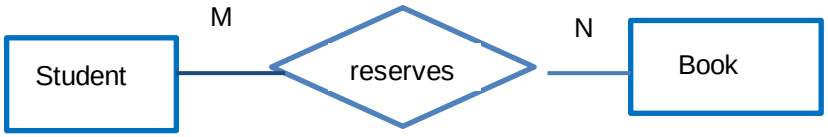
(d) Supposed in (b) above, when a mentor leaves the Polytechnic, a new mentor is assigned to the students. Model the relationship between the students and the mentor if the Polytechnic would like to track the latest/current mentor who has been assigned to a particular student.

Task 3 – Examining the Many-Many relationships

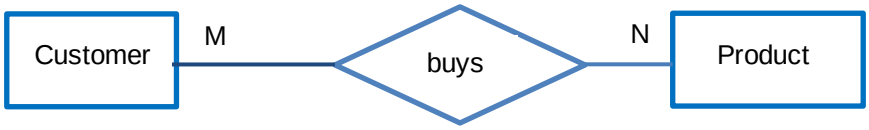
It is common to come across entities that have Many-to-Many relationships. In your own words, describe the following relationships:

(i)

(ii)



(iii)



Task 4 – To determine if the relationship/requirement needs to be modelled

You will find that not all relationships need to be modelled and captured in the ER model. To model unnecessary relationships lead to a complicated and messy data model, and leads to capturing of data and information that is unnecessary. On the other hand, if a relationship that is deemed important is not captured, there will be a "loss" of important data.

Use the scenario illustrated in Task 3(i) as the scope of the user requirements.
Read the following statement and determine if it is a relevant requirement to be captured by the business. Explain your decision. Also state how this requirement is to be included in the model.

(i) The car hirer wishes to rent cars that are below a rental rate of $100 per day.
(ii) The car hirer has less than 1 year of driving experience.
(iii) The car hirer has driven cars in other countries.
(iv) The car hirer likes to go fishing and play golf.
(v) This car was last serviced 3 months ago.
(vi) This car was imported from Mexico.
(vii) This car was last serviced by technician Johnny-Go-Lucky.
(viii) This car was recently driven by the firm's boss to attend an event.
(ix) The car rental firm plans to introduce a rewards program to their potential customers, namely the car hirers.
(x) The car hirer likes to pick up the rented car in different locations (Assumption: cars for hire are always returned to the same branch location).