Week02

Week01 - No Course - 17.09.2018

24.09.2018

Definition:

Entity = it is either an object or a consept.

Student Course Database

Student = {StudentNumber, SName, SSurname}
(P.K.)

Course = {CourseCode, CourseName, Credit}
(P.K.)

"——→ PK."

Entities — attributes

candidate key (C.K.)

A candidate key Atr. is unique.

Among all candidates key Atr. I select primary key Atr.

Student

Header	Stud.Number (P.K.)	SName	SSurname
	001	Emre	Ece
	150	Ali	Ali
	170	Ali	Ece
	005	Emre	Ali
	008	Ali	Ali
	~~001~~	Elena	Elena

→ set of characters

impossible! Already assigned.

Course

Course Code	CourseName	Credit
CMPE 351	Database	3
CMPE 403	Digital Image	3

follows = StudentNumber, CourseCode

follows (F.K.)

StudentNumber	CourseCode
001	CMPE 351
001	CMPE 403
150	CMPE 403
170	CMPE 403

Step 1 : Learn the mini-world that you have to create the database (db) for

Step 2 : Entity Relations Model (ER) = Top level of abstraction ⟨ diagram / scheme

Data : (Ayse , 13 , CS , 2)

Model = (StudentName , SNumber , Dep. , Year)

Step 3 : Implementation data model : Example Relational DB., Network DB, Object Oriented DB., Hierarchical DB.

X Step 4 : low level of physical data model.

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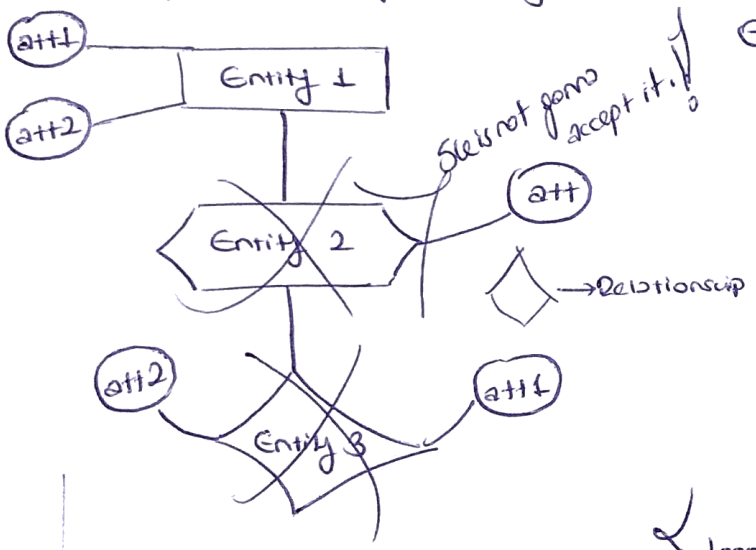
ENTITY = A real world object or concept.

Relationship = Among 2 or more ENTITY represents an interaction among entities.

Pictorial Representation of ER diagram :



Memory Hierarchy

primary storage { register, cache, main memory (MM) } — ROM (read only) / RAM (Random Access Memory).

⊕ quick, fast, little ⊖ expensive ⊖ volatile

secondary storage { Hard Disk, Flash, DVD, CD }

⊕ big ⊕ cheap ⊖ slow ⊕ permanent.

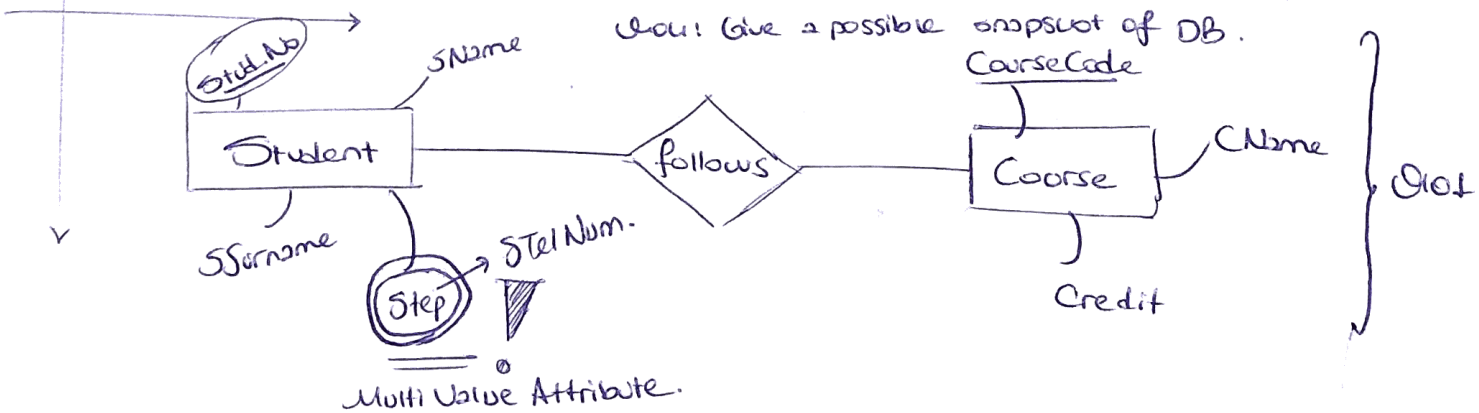
Q101 : Give the ER diagram.

Q102 : Give the ER Scheme.

Q103 : Give the relational scheme.

✓ Impossible to have multivalued composite attribute.

Q104 : Give a possible snapshot of DB.



Q101

Student = (StudNo , Stud.Name, SSurname, {Step})

Course = (CourseCode , CName , Credit)

follows = (StudentNo (studentnumber.) , CourseCode , year)

year could be (Normal Att.)

Q102

Quick Answer:

Student

StudentNo	SName	SSurname
111	Efe	Ali
231	Ali	Emre
001	Ali	Ali

← header

← records, tuples, rows.

Course

CourseCode	CName	Credit
---	---	--
--	---	--

follows

StudentNo	CourseCode
111	CMPE351
111	CMPE101
~~111~~	~~EMRE351~~

CHAPTER 3: DATA MODELLING USING THE ENTITY RELATIONSHIP MODEL

ENTITY = Mini World - It is either an object or a concept.

ENTITY TYPE = A collection of entities having the same attributes.

Ex

Student = (S#, SName, SAddress)

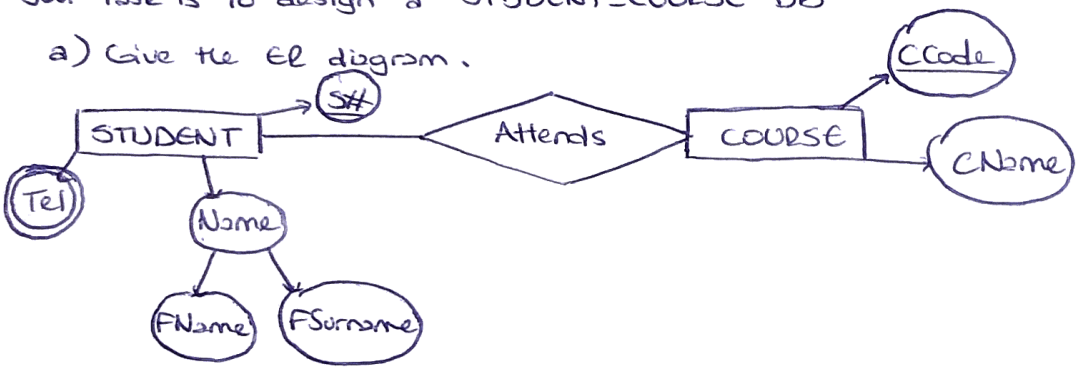
↓ Name of Entity ↘ ↓ ↓ ↙ Attributes

Employee = (E#, EAddress, ESalary)

Attribute → simple
→ composite Ex
Address = (Street, Number, City, Zip)
S.Name = (FName, Surname)
↓
multivalued Ex
Telephone Number

Your task is to design a STUDENT_COURSE DB

a) Give the ER diagram.



* Composite Attribute Primary Key olamaz.

The PK must be MINIMAL.

b) Give the corresponding ER schema.

STUDENT = (S#, Name(FName, FSurname), {tel})
COURSE = (CCode, CName)
attends = (S#, CCode)

c) Give the relational schema.

Composite Attribute → Solution 1: split the atr.
→ Solution 2: ignore it.

Solution 1

STUDENT = (S#, FName, Surname)

S#	FName	Surname
001	Elsa	Ece
010	Oya	Oya

Solution 2

STUDENT = (S#, Name)

S#	Name
001	Elsa Ece
010	Oya oya

Stud_Tel = (S#, Tel)

multivalued = take it out + create a new relation having P.K.

Monday, 15 October
WEEK 05

ENTITY RELATIONSHIP MODEL ——diagram
\ schema

↓

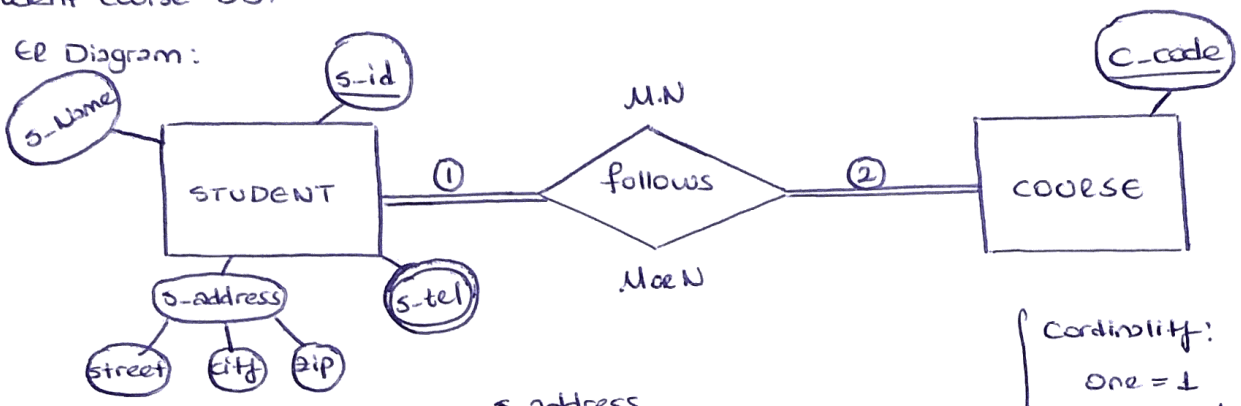
RELATIONAL DATABASE (it was math. background.) —schema

↓

SNAPSHOT (useful) In Exam: 1 multivalued and 1 composite

Student Course DB.

ER Diagram:



Composite Att.:

* Cardinality:
- One = 1
- Many = M or N
- M.N
- 1.M = M.1
- 1.1

ER Schema:

Student = (s_id , s_name, s_address (city, street, zip), {s_tel})

Course = (c_code , c_name)

follows = (s_id , c_code)

Relational Schema:

Solution 1: split the composite attribute.

Student = (s_id , s_name, street, zip, city)
⊛

Solution 2: ignore it.

Student = (s_id , s_name, s_address)

Stud_Tel = (s_id , s_tel) ⊛

rest is the same.

SNAPSHOT for Sol2:

Student

s_id	s_name	s_address
1152000	Tuğberk	ooo

SNAPSHOT for Sol.1:

STUDENT

S-id	S-name	s-street	zip	city
111	ELA	A		
101	X	B		
001	Y	C		
010	Z	D		

STUDENT TEL → foreign key.

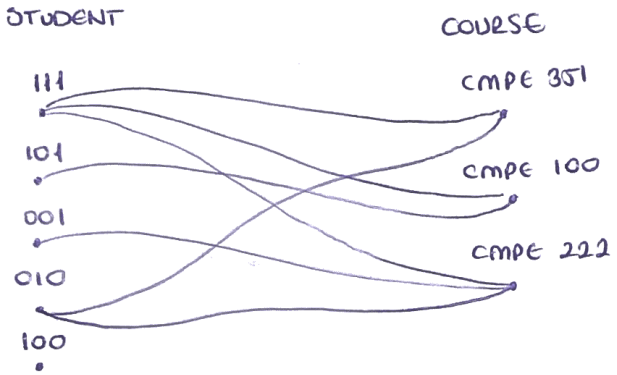
S-id	s-tel
111	21244
101	21233
001	21212
010	21266

COURSE

C-Code	C-name
1152	DB
1153	IP
6572	CD

follows (M,N)

s-id	c-code
111	CMPE252
101	CMPE211
001	CMPE101



PARTICIPATION:

TOTAL: Every entity ∈ entity set is present in R.

Partial: At least 1 entity is not present in R.

① is TOTAL because every student follows at least 1 course.

② is TOTAL because every course has at least 1 student.

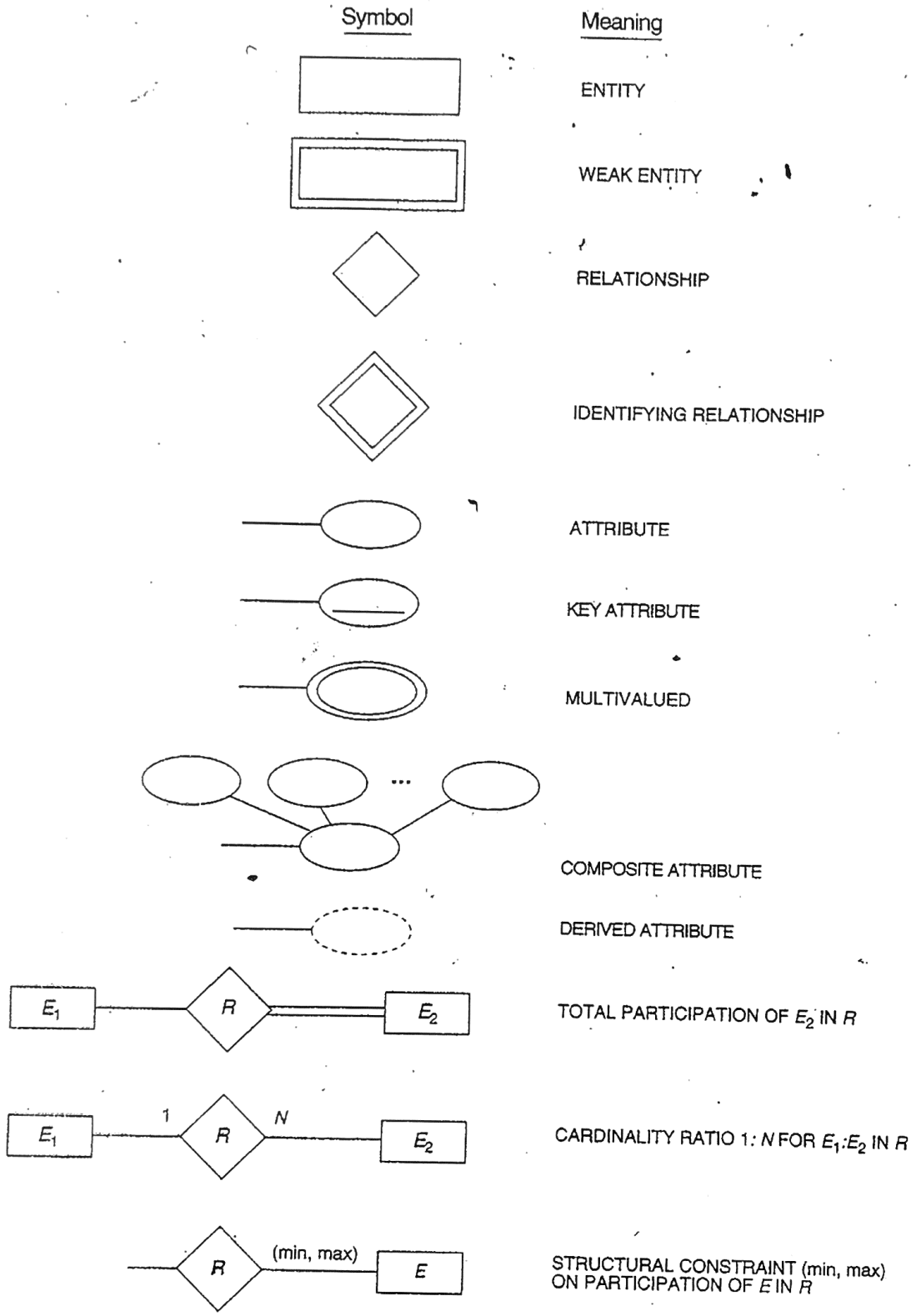


Figure 3.14 Summary of ER diagram notation.

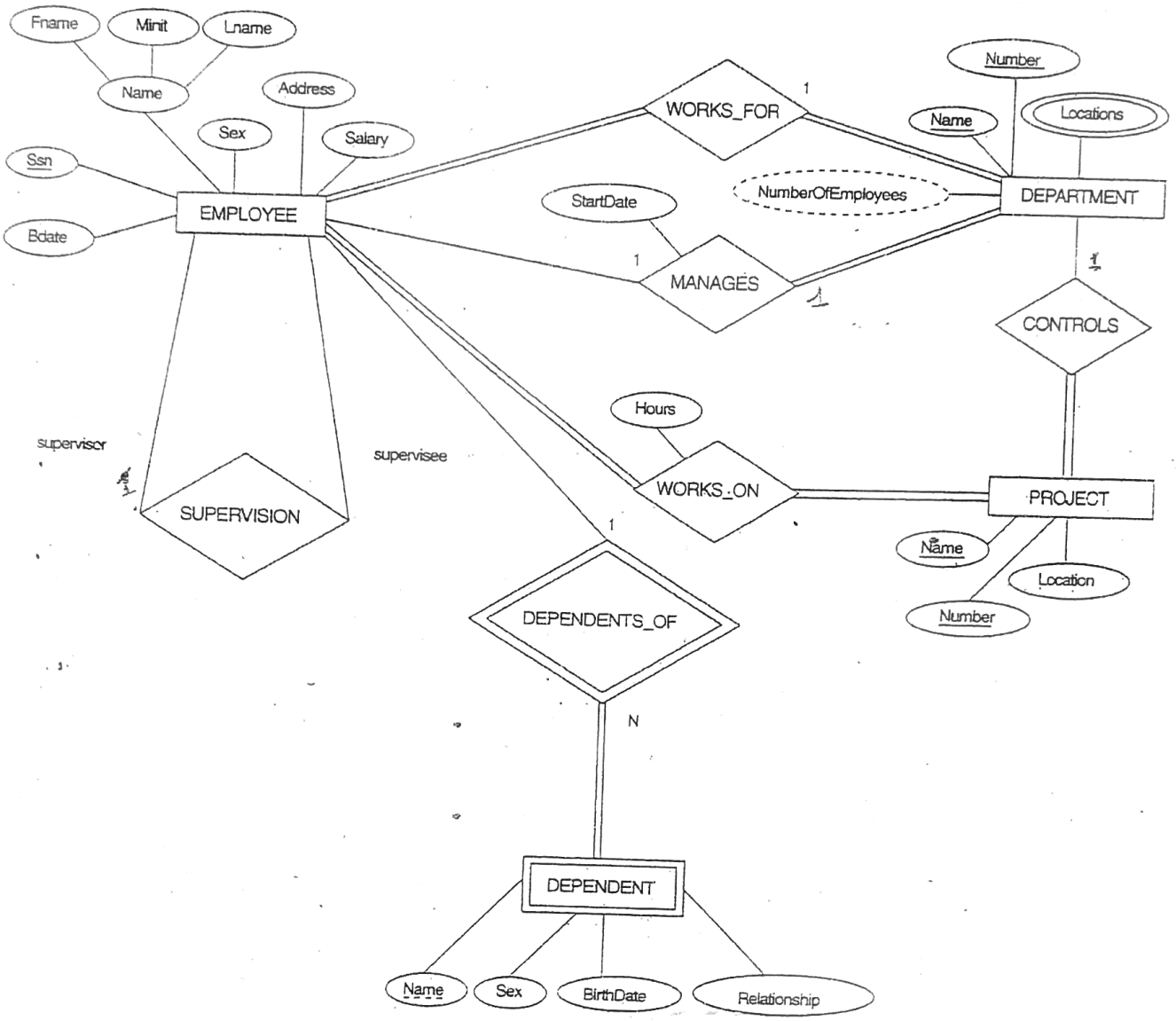


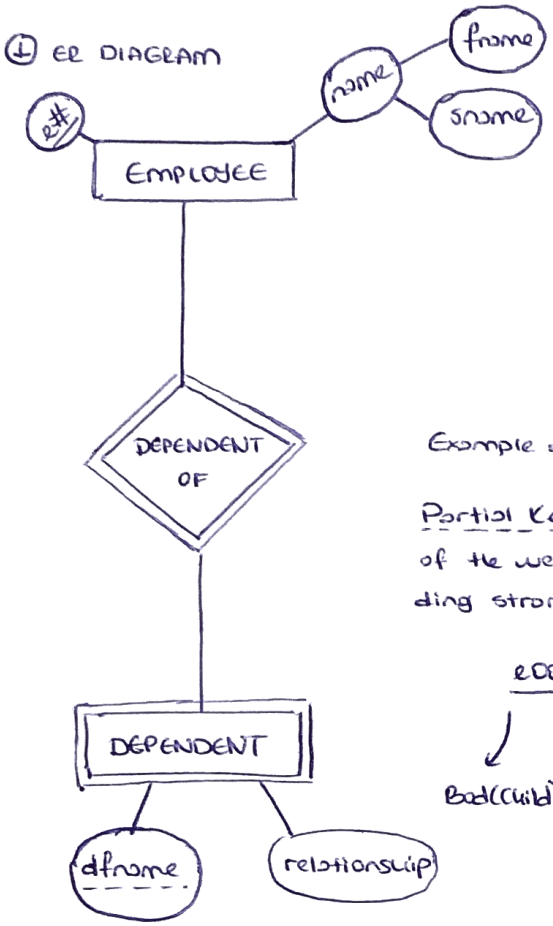
Figure 3.2 ER schema diagram for the COMPANY database.

22 MONDAY, 2018

WEEK06

Weak Entity = It does NOT have a primary key on its own.
It needs to have a corresponding strong entity.

① ER DIAGRAM



Example of corresponding strong entity.

Example of week entity:

Partial Key = a special attribute of week entity which will form. The P.K. of the week entity when it is coupled together with P.K. of the corresponding strong entity.

e001 Jon Smith → Peter (Child)
Bob (Child) ~~Ayş~~ Mary (Wife)

e010 Ali Emre
Bob (Child) Ayş (Wife)

ER SCHEMA

EMPLOYEE = (e#, name (fname, sname), {tel})

DEPENDENT = (dfname, relationship)

dependent of = (e#, dfname)

RELATIONAL SCHEMA

EMPLOYEE = (e#, name)

EMP_TEL = (e#, Tel)

DEPENDENT = (dfname, e#, relationship)

Implicit Imp. of