

A decorative graphic on the left side of the slide, consisting of a network of white lines and circles on a blue gradient background, resembling a circuit board or a tree structure.

# WEEK 6

EER DIAGRAMS – MAPPING THE EER DIAGRAM TO RELATIONAL TABLES

CS3319

# STUDENT OBJECTIVES

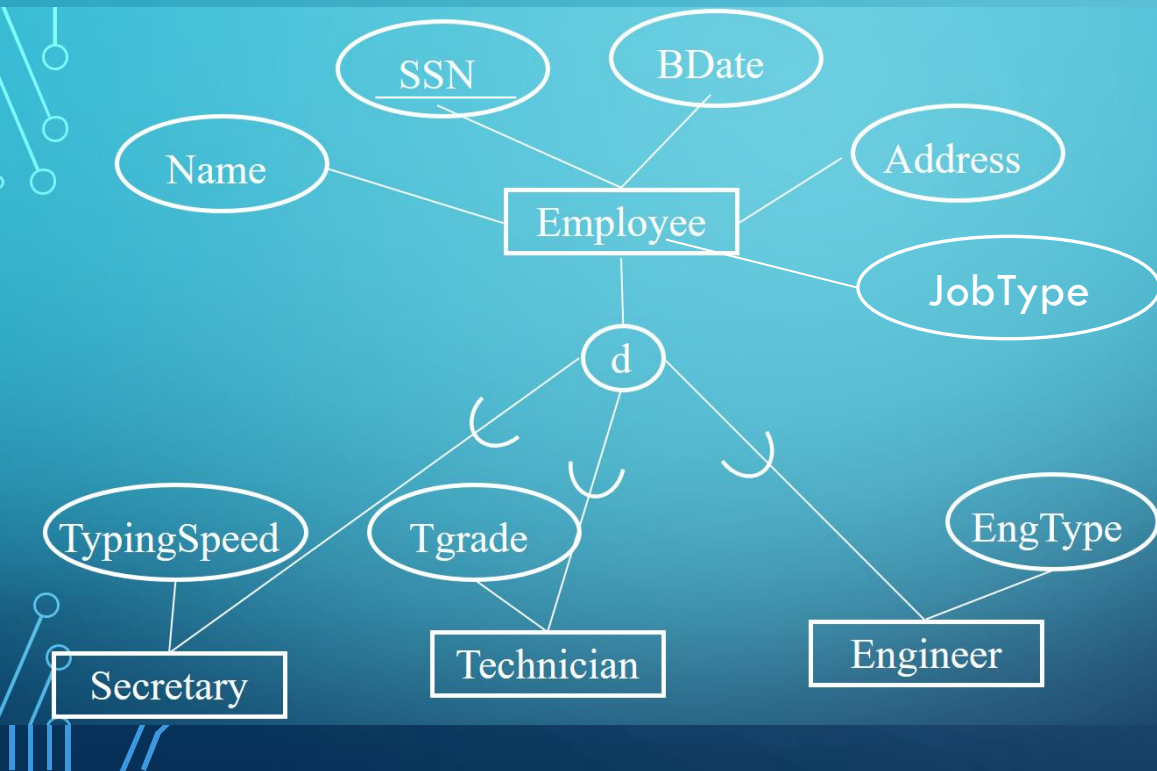
- Upon completion of this video, you should be able to:
  - Given an EER diagram, convert it to relational tables using one of the four rules.

# MAPPING EER DIAGRAMS TO RELATIONS:

In Lecture 2, we introduced 7 steps to convert an ER diagram to a relational database, now we add Step 8:

**Step 8:** Convert each specialization with  $m$  subclasses  $\{S_1, S_2, \dots, S_m\}$  and (generalized) superclass  $C$ , where the attributes of  $C$  are  $\{k, a_1, \dots, a_n\}$  and  $k$  is the (primary) key, into relations schemes using one of the four following options:

- **Option 8A Multiple relations – superclass and subclasses:** Create a relation L for C (superclass) with attributes =  $\{k, a_1, \dots, a_n\}$  and primary key = k. Create a relation  $L_i$  for each subclass  $S_i$ ,  $1 \leq i \leq m$ , with the attributes of  $L_i = \{k\} \cup \{\text{attributes of } S_i\}$ , and primary key of  $L_i = k$ .



**Employee**

SSN	Name	Bdate	Address	JobType
22	Homer Smith	2/2/1970	Springfield	Tec
33	Lisa Jones	1/1/90	London	Eng
34	Bob Lee	4/4/91	London	Eng
56	Laura Cook	2/19/64	London	Sec

**Secretary**

SSN	TypingSpeed
56	60

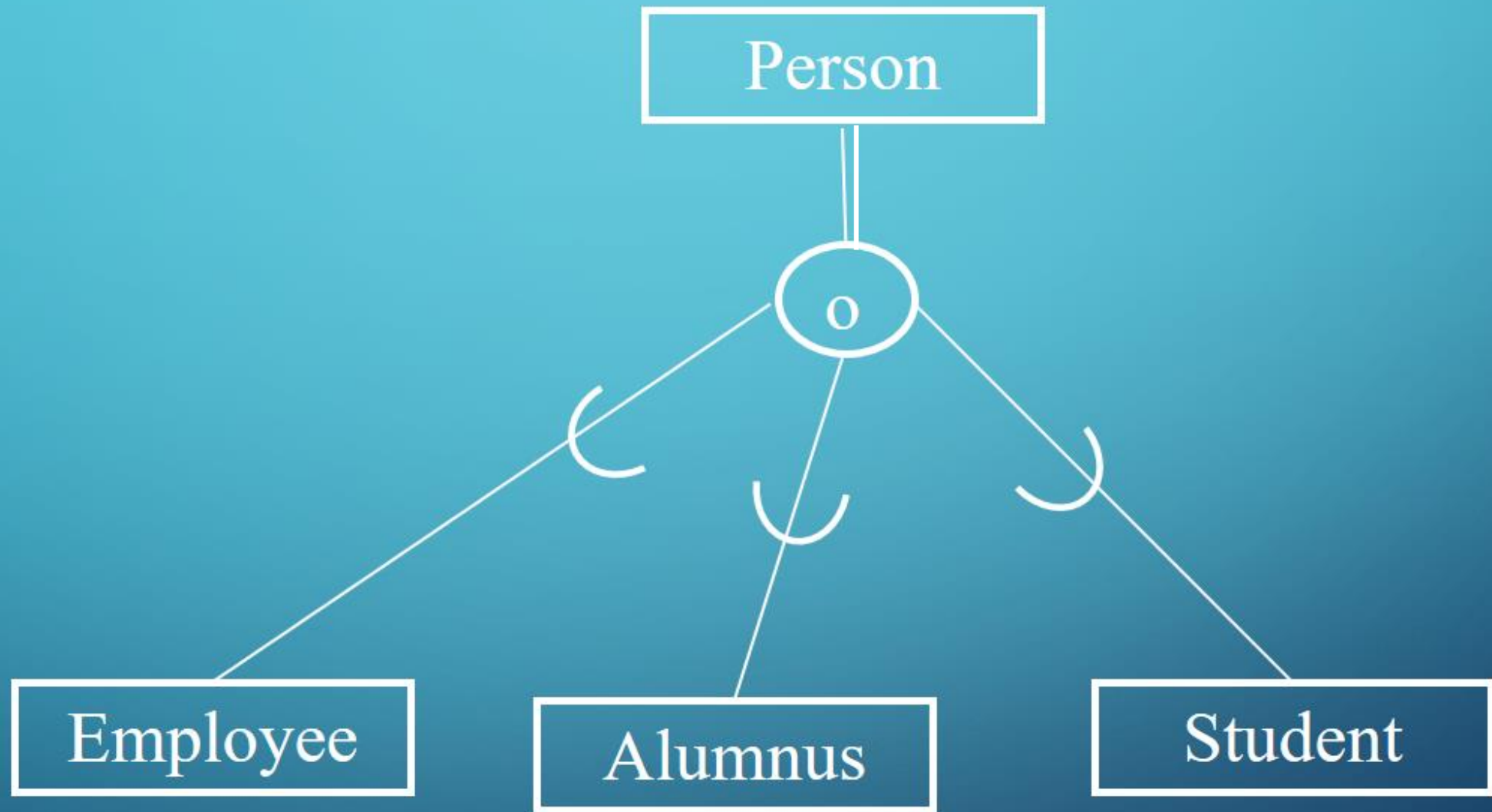
**Technician**

SSN	Tgrade
22	Tgrade7

**Engineer**

SSN	EngType
33	Civil
34	Chemical

10/15/2023



**Employee**

FirstName	LastName	<u>SSN</u>	Salary
Laura	Reid	111	4000.00
Sue	Smith	121	3000.00

**Alumni**

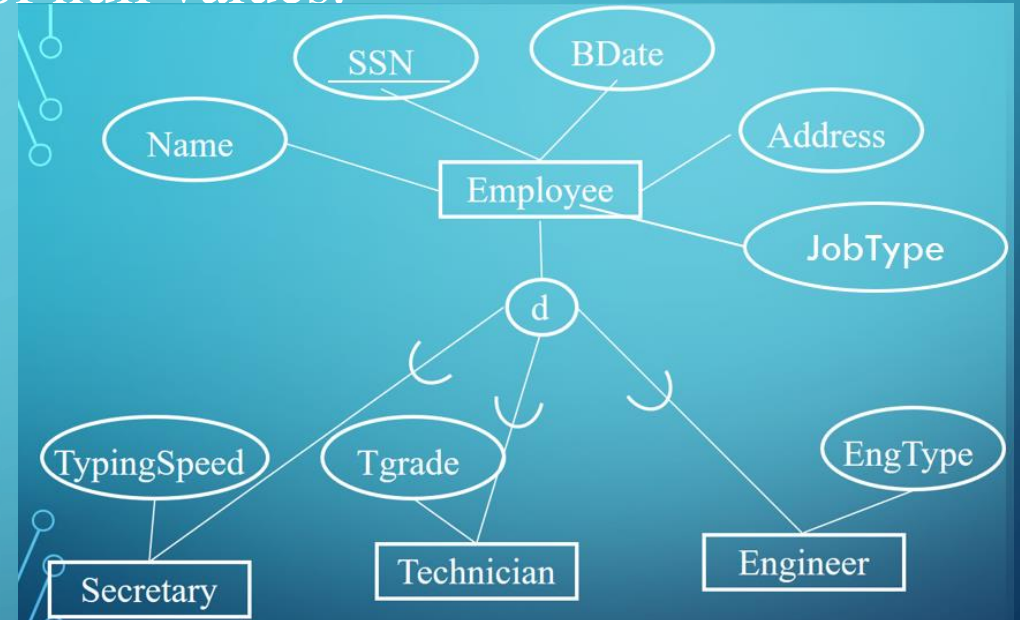
FirstName	LastName	<u>SSN</u>	Degree
Laura	Reid	111	MSc

$l \leq i$   
do not

ICY!

● **Option 8C Single relation with one type attribute:** Create a single relation L with attributes  $\{k, a_1, \dots, a_n\} \cup \{\text{attributes of } S_1\} \cup \dots \cup \{\text{attributes of } S_m\}$  and primary key = k.

This option is for *disjoint* subclasses, with a discriminating attribute or category, and has the potential for generating a large number of null values.



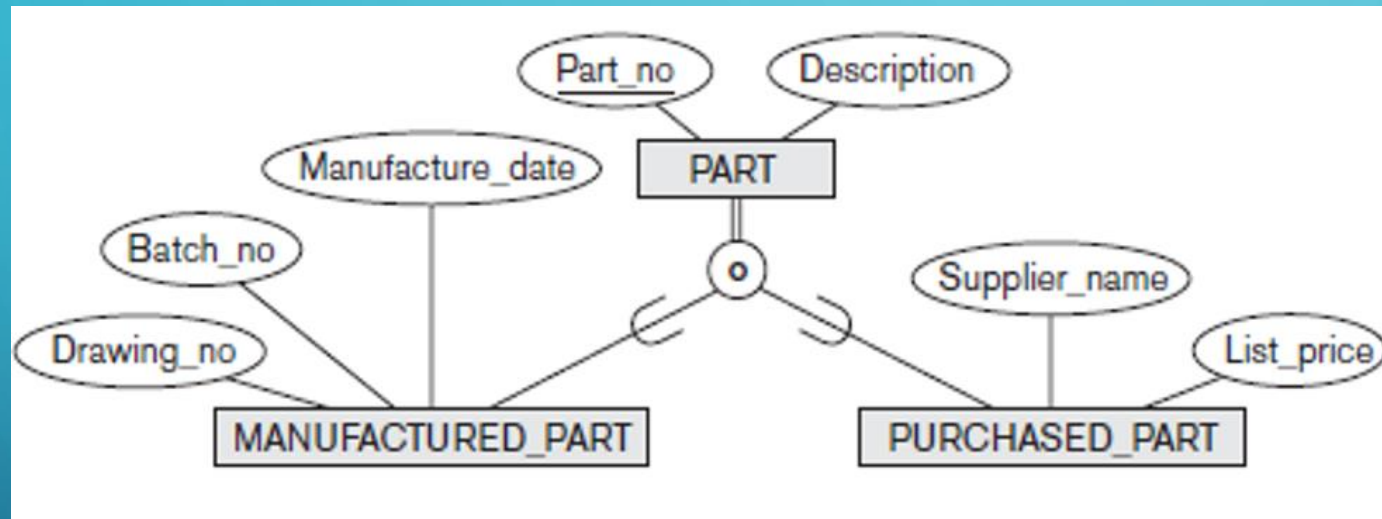
**Employee**

<u>SSN</u>	Name	Bdate	Address	JobType	TypingSpeed	Tgrade	EngType
22	Homer Smith	2/2/1970	Springfield	Tec	Null	Tgrade7	Null
33	Lisa Jones	1/1/90	London	Eng	Null	Null	Civil
34	Bob Lee	4/4/91	London	Eng	Null	Null	Chemical
56	Laura Cook	2/19/64	London	Sec	60	Null	Null



- **Option 8D Single relation with multiple type attributes:** Create a single relation L with attributes  $\{k, a_1, \dots, a_n\} \cup \{\text{attributes of } S_1\} \cup \dots \cup \{\text{attributes of } S_m\} \cup \{t_1, t_2, \dots, t_m\}$  with primary key k.

This option is for *overlapping* subclasses, and each  $t_i$ ,  $1 \leq i \leq m$ , is a Boolean attribute indication whether this tuple belongs to subclass  $S_i$ .



Part

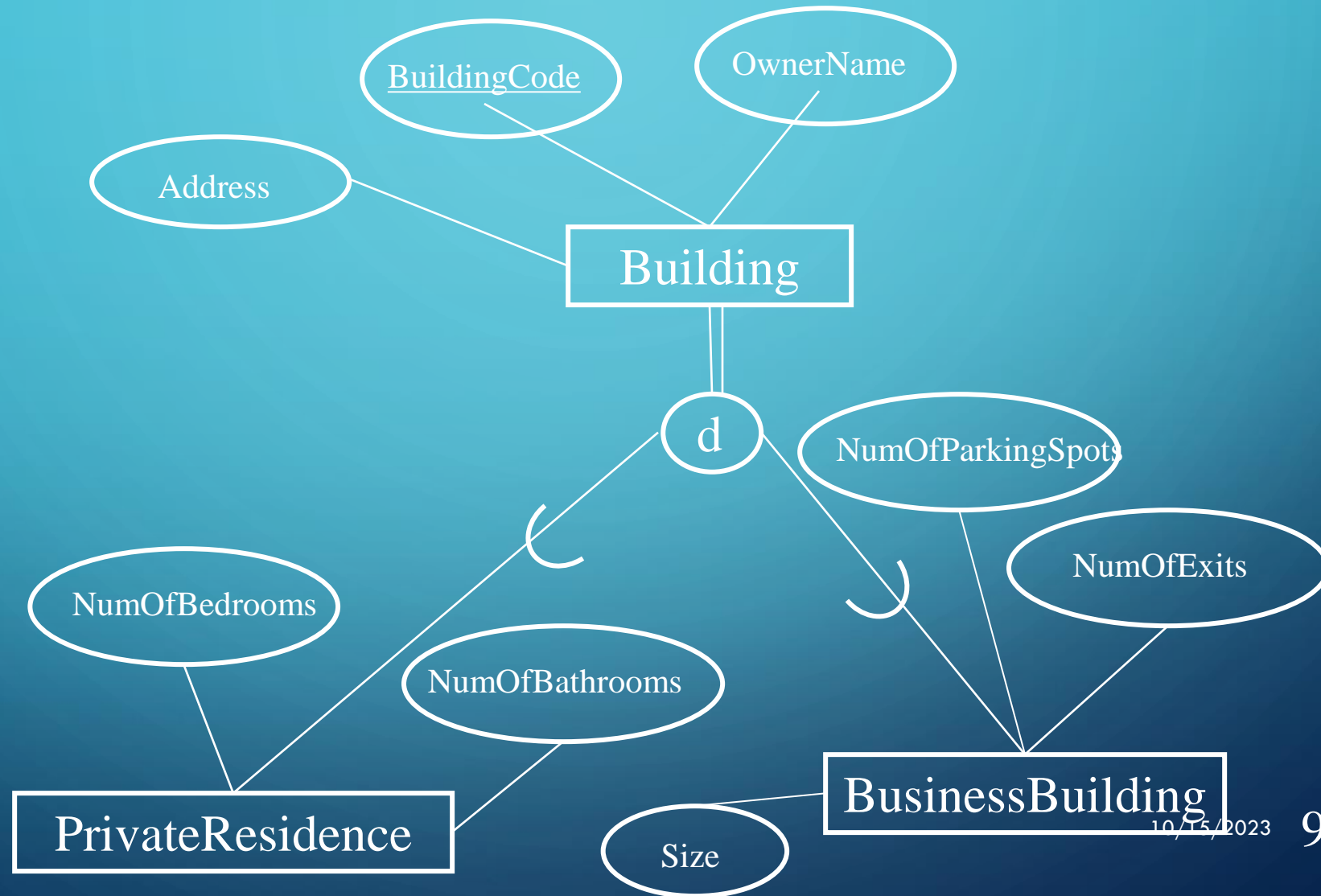
PartNo	Descrip	Mflag	DrawingNo	BatchNo	ManufDate	Pflag	Supplier_Name	ListPrice
111	Screw	True	6758	A3	2/2/2018	False	Null	Null
222	Hammer	False	Null	Null	Null	Null	Rona	45.00
333	Drill	True	8765	A7	1/1/2018	True	Home Hardware	129.00

## ANOTHER EXAMPLE:

- City Hall is trying to classify its buildings for taxing purposes.
  - Every building has an address and a unique building code and the owner's name.
  - A building must be either a private residence or business, but it cannot be both.
  - For private residences, city hall wants to also keep track of the number of bedrooms and number of bathrooms.
  - For a business, they want to keep track of the number of exits, size of the property, and the number of parking spots.



**QUESTION: Draw an EER diagram to reflect this example:**



Map your EER diagram to relational table(s):

## BusinessBuilding

<u>BuildingCode</u>	OwnerName	Address	Size	NumOfParkingSpots	NumOfExits
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## PrivateResidence

<u>BuildingCode</u>	OwnerName	Address	NumOfBedrooms	NumOfBathrooms
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