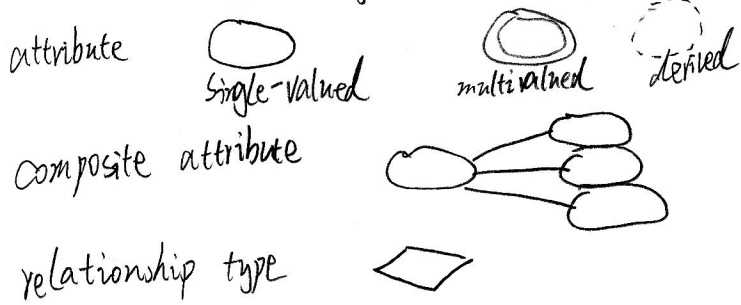


Database

Entity-Relationship (ER) conceptual modeling

Entity Type an object that exists and distinguishable from other objects (e.g. student); represented by a set of attributes (e.g. student-id, name, major)



Cardinality

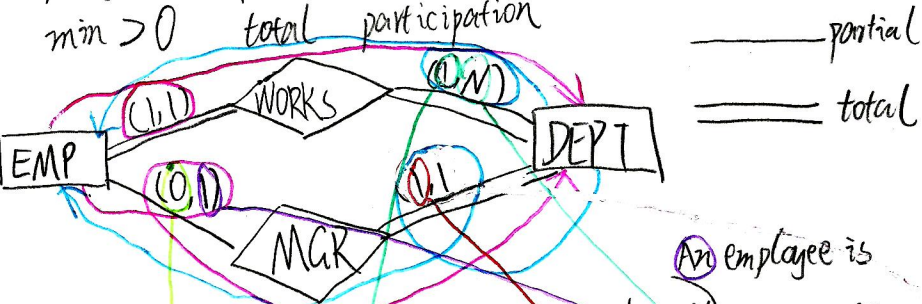
1:1 An entity in A is associated with at most one entity in B.
An entity in B is associated with at most one entity in A.

1:N An entity in A is associated with any number of entities in B.
An entity in B is associated with at most one entity in A.

M:N An entity in A is associated with any number of entities in B.
An entity in B is associated with any number of entities in A.

MIN/MAX PAIRS

(min, max)
min = 0 partial participation
min > 0 total participation



An employee is not a manager, but if a manager, manages exactly one department.

A department must have exactly one manager

A department must have at least one employee, but many employees can work in a department.

An employee must work in exactly one department.

Database

KEYS

Primary Key — A candidate key that is chosen by the DBA as the principal means of identifying entities.

Strong Entity: an entity that has a primary key

Weak Entity: an entity that does not have sufficient attributes to form a primary key.

Student		
id	name	major
1111	A	CS
2222	B	EE
3333	C	EE

The set of attributes names for a relation schema:

Student (id, name, major)

it denoted by

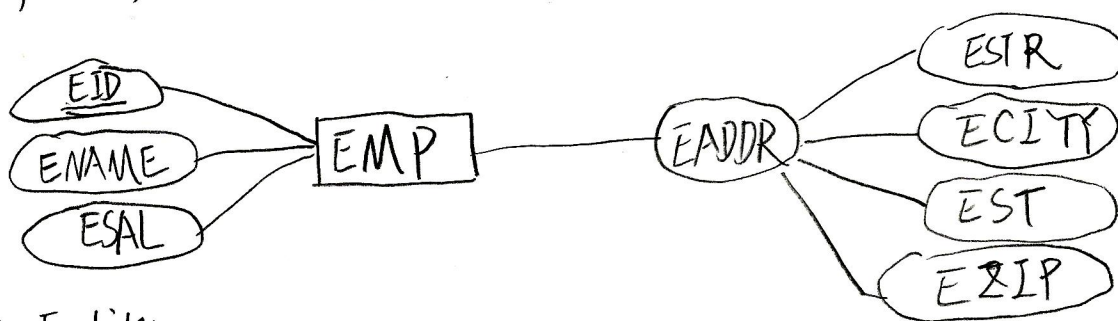
STUDENT = {id, name, major}

Strong Entity

Attributes: Simple attributes of the entity and the simple components of the composite attributes

Candidate Key: Candidate key of entity

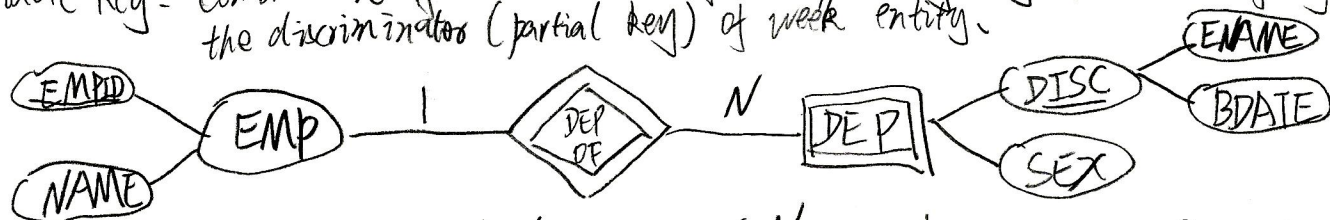
emp (eID, eName, eSal, eStr, eCity, eSt, eZip)



Weak Entity

Attributes: simple attributes and simple components of composite attributes of the entity itself and the attributes corresponding to the primary key of its identifying owner.

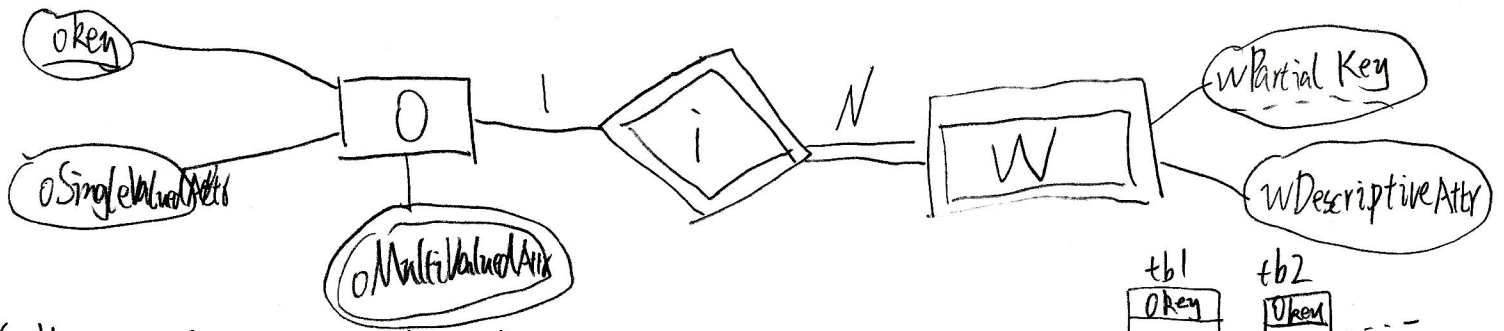
Candidate Key: combination of the attributes of the primary key of the identifying owner and the discriminator (partial key) of weak entity.



dep(empID, fName, bDate, sex)

Database

Multivalued Attributes and Identifying Relationships.



oKey, oSingleValuedAttr

oMultivaluedAttr

// oMultivaluedAttr is a table.

W (oKey, wPartialKey, wDescriptiveAttr) // Weak-Entity

tbl
oKey

tbl
oKey

For oMulti:

Since each entity instance can have multiple values of oMultivaluedAttr, the key for the table eMulti is a composite key consisting of oKey and oMultivaluedAttr.