

Conversion of ER model to Relational Model

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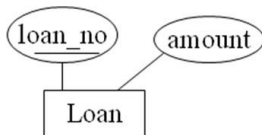
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A database that conforms to an ER diagram schema can be represented by a collection of relational schemas. Both the ER model and Relational data model are abstract, logical representations of real-world enterprises

1. Representation of Strong Entity sets

A strong entity set reduces to a schema with the same attributes. The primary key of the entity set serves as the primary key of the resulting schema

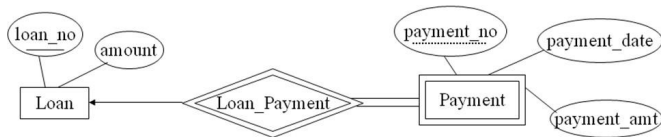


Loan = (loan_no, amount)

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2. Representation of Weak Entity sets

A weak entity set becomes a table that includes a column for the primary key of the identifying strong entity set. The primary key is constructed by the collection of foreign key and partial key



Loan = (loan_no, amount)

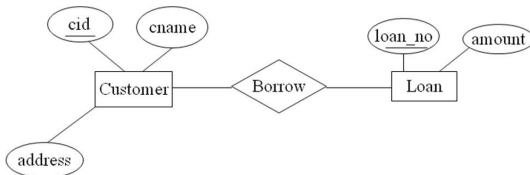
***Payment = (loan_no, payment_no, payment_date,
payment_amt)***

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3. Representation of Relationship sets

3.a. Binary M:N

Union of the primary key attributes from the participating entity sets becomes the primary key of the relationship



Customer = (cid, cname, address)

Loan = (loan_no, amount)

Borrow = (cid, loan_no)

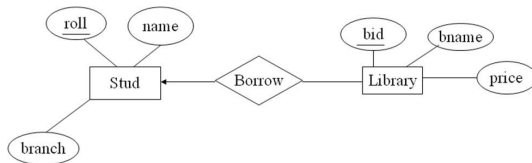
If borrow_date is mentioned as descriptive attribute, then

Borrow = (cid, loan_no, borrow_date)

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3.b. Binary M:1/1:M

Construct two tables, one for the entity set at 1 side and another for entity set at M side, add the descriptive attributes and a reference of the primary key of 1 side to the entity set at M side



Stud = (roll, name, branch)

Library = (bid, bname, price, roll)

The foreign key can be represented by specifying the name as:

Library = (bid, bname, price, borrowing_roll)

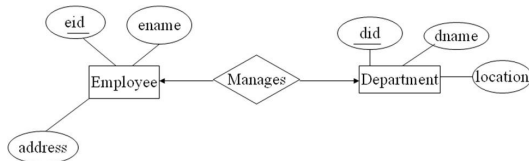
If borrow_date is the descriptive attribute, then

Library = (bid, bname, price, borrowing_roll, borrow_date)

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3.c. Binary 1:1

Construct two tables. In this case, either side can be chosen to act as the many side. That is, extra attributes can be added to either of the tables corresponding to the two entity sets, but not at the same time



Employee = (eid, ename, address, did)

Department = (did, dname, location)

If it is required to mention the relationship name, then

Employee = (eid, ename, address, manager_id)

If department entity set will be considered as many side, then

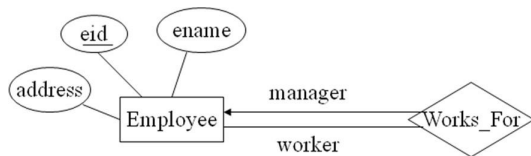
Employee = (eid, ename, address)

Department = (did, dname, location, manager_id)

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4. Representation of Recursive Relationship sets

Two tables will be constructed; one for entity set and one for relationship set



Employee = (eid, ename, address)

Works_for = (mgrid, workerid)

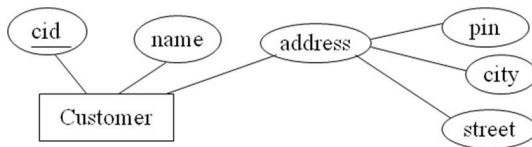
This ER diagram can also be represented by using a single relation schema. In such cases, the schema contains a foreign key for each tuple in the original entity set

Employee = (eid, ename, address, manager_id)

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5. Representation of Composite attributes

The composite attributes are flattened out by creating a separate attribute for each of its parts

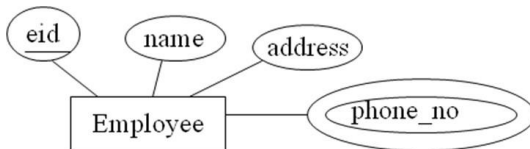


Customer = (cid, name, address_street, address_city, address_pin)

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6. Representation of Multi-valued attributes

A multi-valued attribute M of an entity set E is represented by a separate schema E_M as E_M(primary key of E,M)

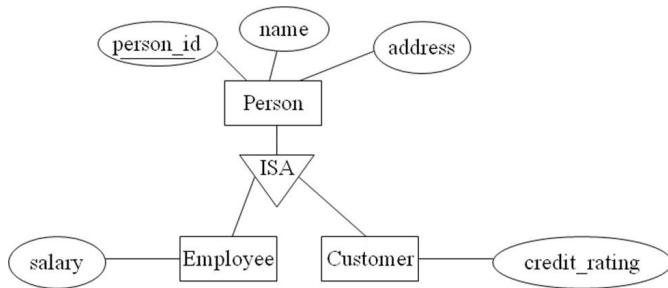


Employee = (eid, name, address)
Employee_phone_no = (eid, phone_no)

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7. Representation of Generalization/Specialization

In case of generalization/specialization-related ER diagram, one schema will be constructed for the generalized entity set and the schemas for each of the specialized entity sets



Person = (person_id, name, address)

Employee = (person_id, salary)

Customer = (person_id, credit_rating)

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Representation of Generalization/Specialization...

When the generalization/specialization is a disjointness case, the schemas are constructed only for the specialized entity sets

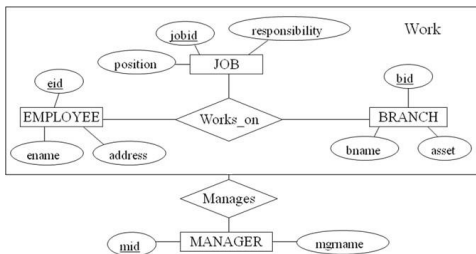
Employee = (employee_id, name, address, salary)

Customer = (customer_id, name, address, credit_rating)

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8. Representation of Aggregation

To represent aggregation, create a schema containing the primary key of the aggregated relationship, primary key of the associated entity set and descriptive attributes (if any)



Employee = (eid, name, address)

Branch = (bid, bname, asset)

Job = (jobid, position, responsibility)

Works_on = (eid, bid, jobid)

Manager = (mid, mgrname)

Manages = (eid, bid, jobid, mid)