IFB105: Database Management

Tutorial 4 – Rmapping

Part 1 – Week 4 Summary

Activity 1

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Q1. Relational Mapping is the basic procedure for mapping an ORM conceptual schema onto a relational (logical) schema. What are the 4 rules of Relational Mapping?

Activity 1

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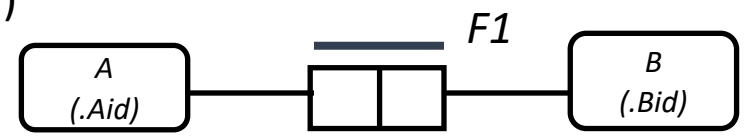
Q2. Correct or Incorrect?

(a)

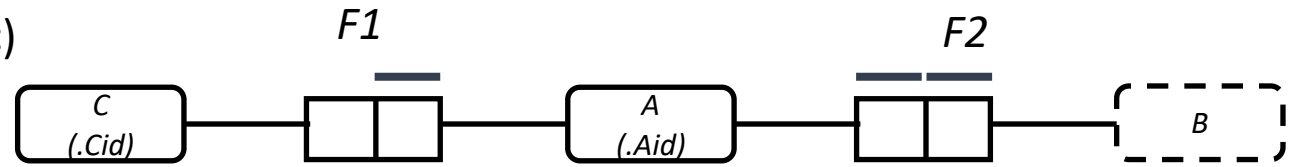


F1: {.Aid, .Bid}

(b)

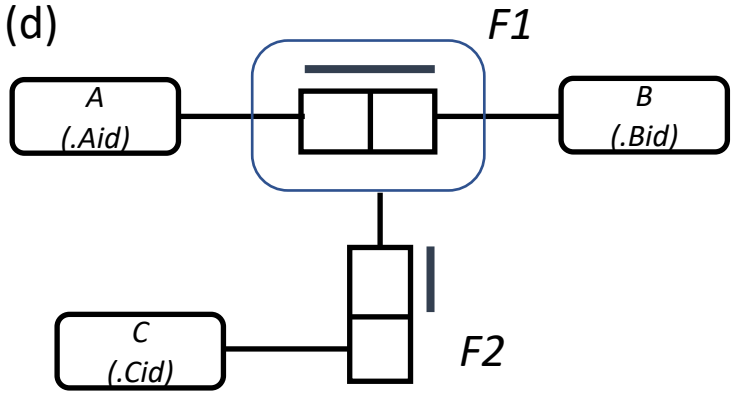
F1: {A, B}

(c)



A: {.Aid, B, .Cid}

(d)



F1: {A, B, C}

Activity 1

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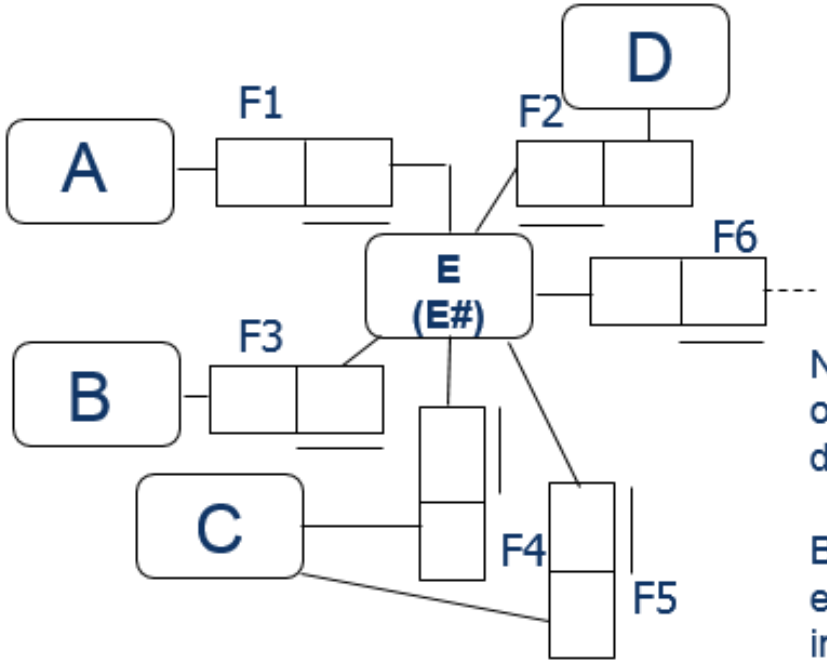
Q3. Rule 2 - Revision



E: {E#, A, B, F4_C, F5_C, D}

Notice how instances of C are stored twice: once for each role that C instances play in the database.

Be aware that other fact types attached to an entity type (F6), and don't follow Rule 2, are not included in the relation.

Activity 1

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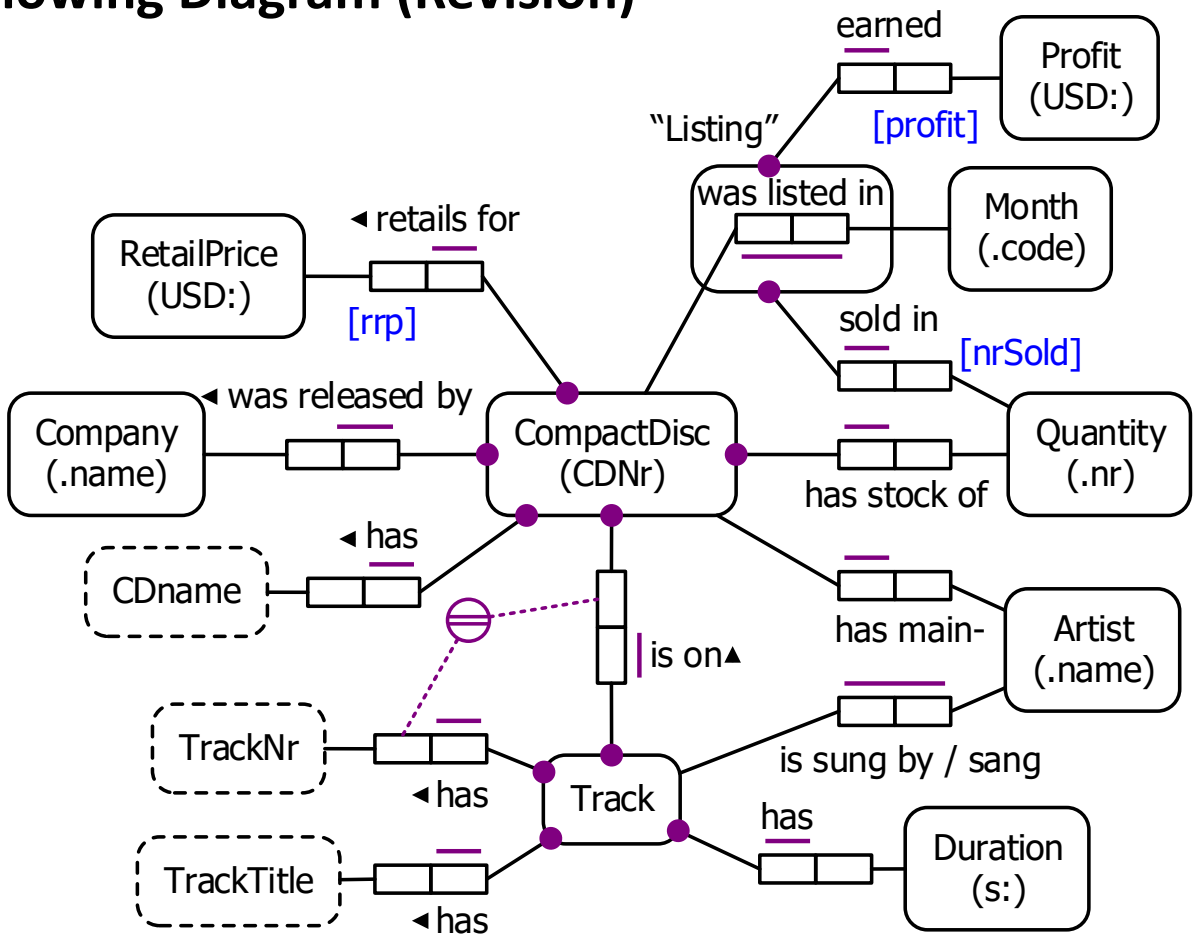
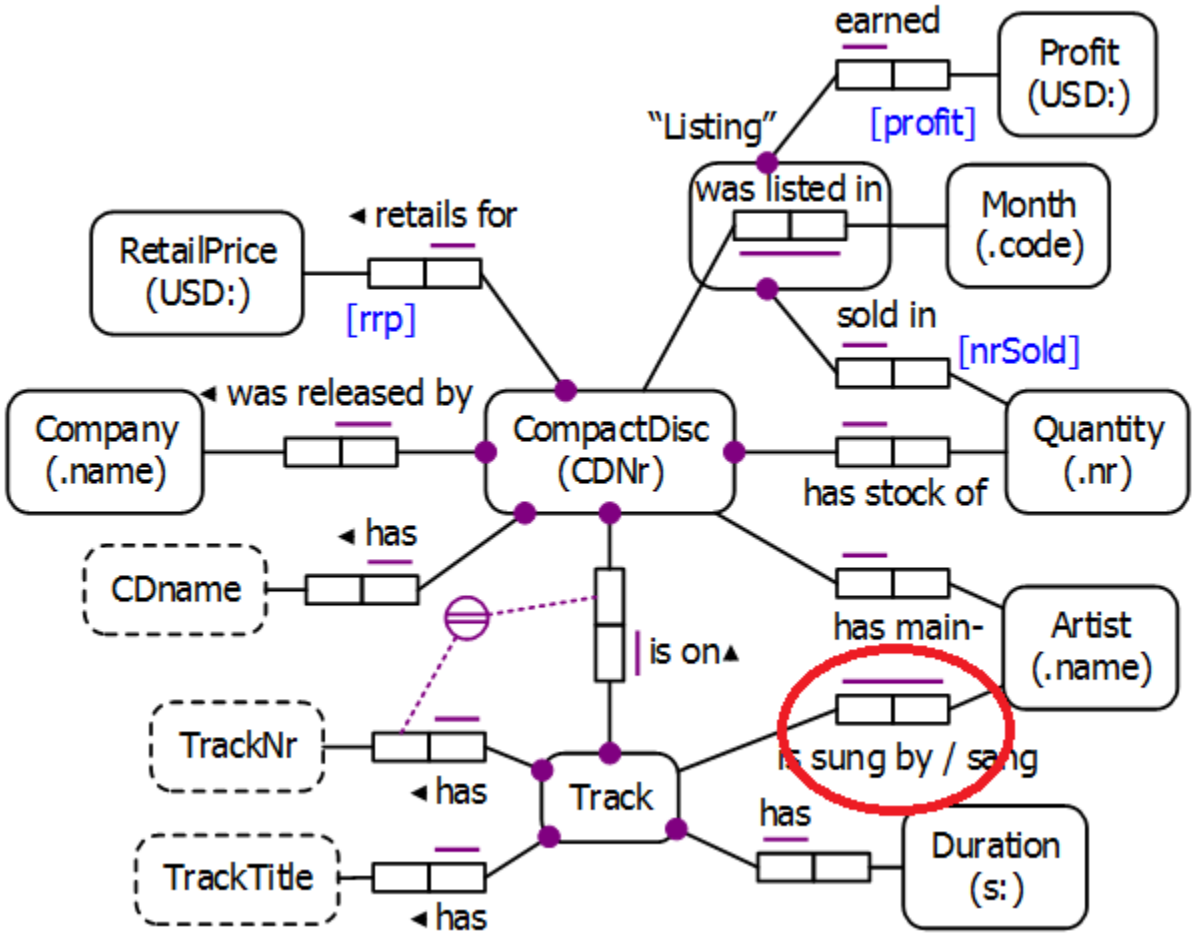
Q3. Apply Rmapping to the following Diagram (Revision)



Case study – Rule 1

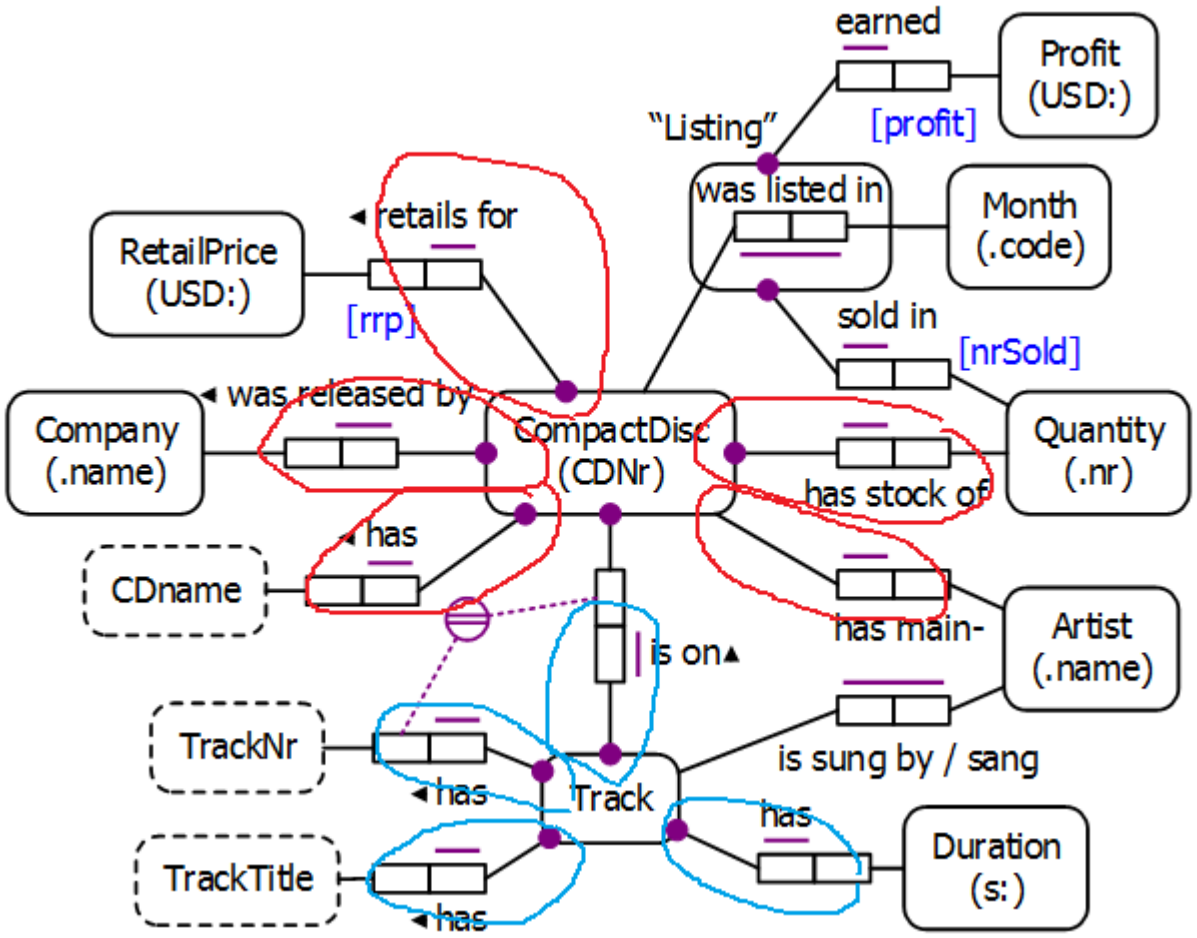
(Constraint spanning more than one role)



SungBy (<u>Artist, Track</u>)

Case study – Rule 2

(Simple uniqueness constraint)

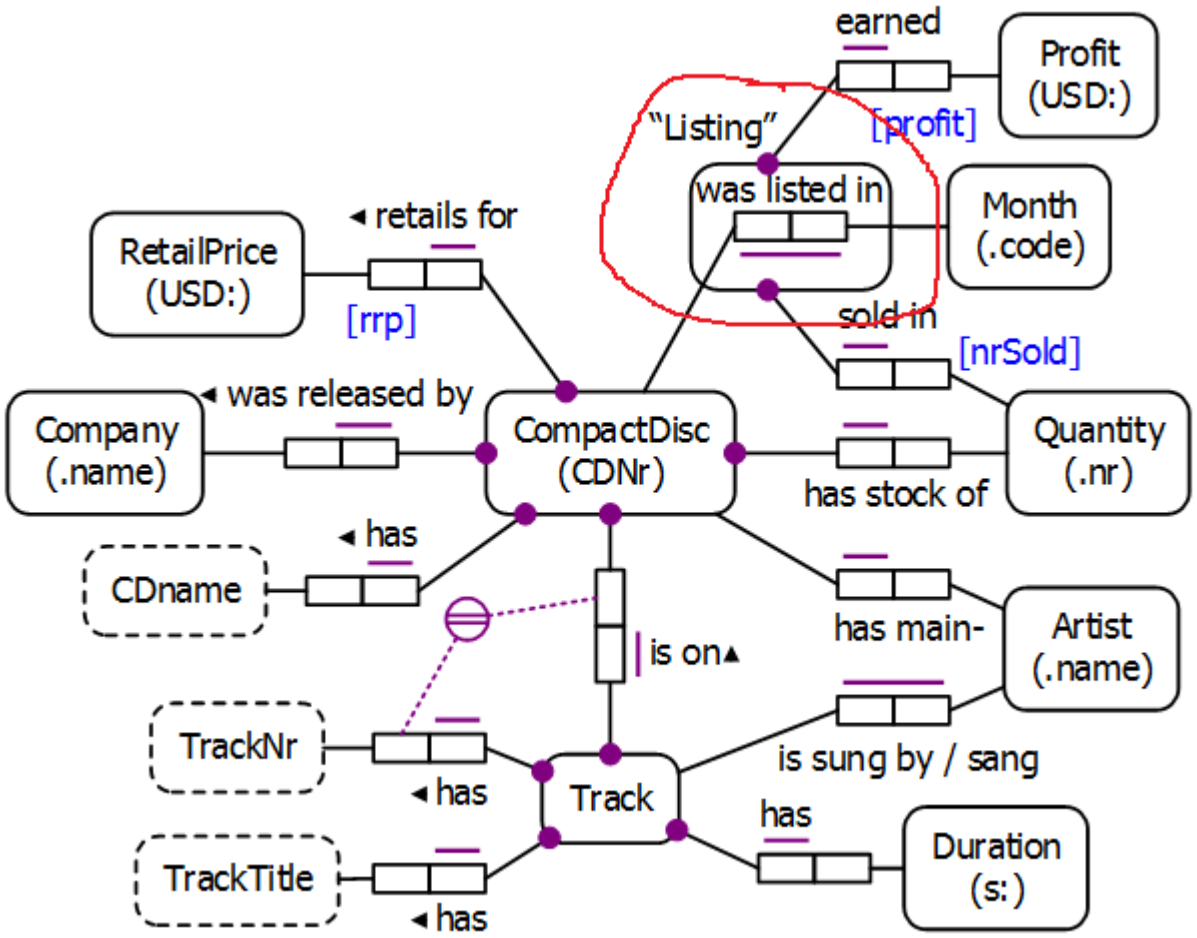


CompactDisc (CDNr, QuantityNr, ArtistName, CDName, CompanyName, RetailPrice)

Track (TrackNr, CDNr, Duration, TrackTitle)

Case study – Rule 3

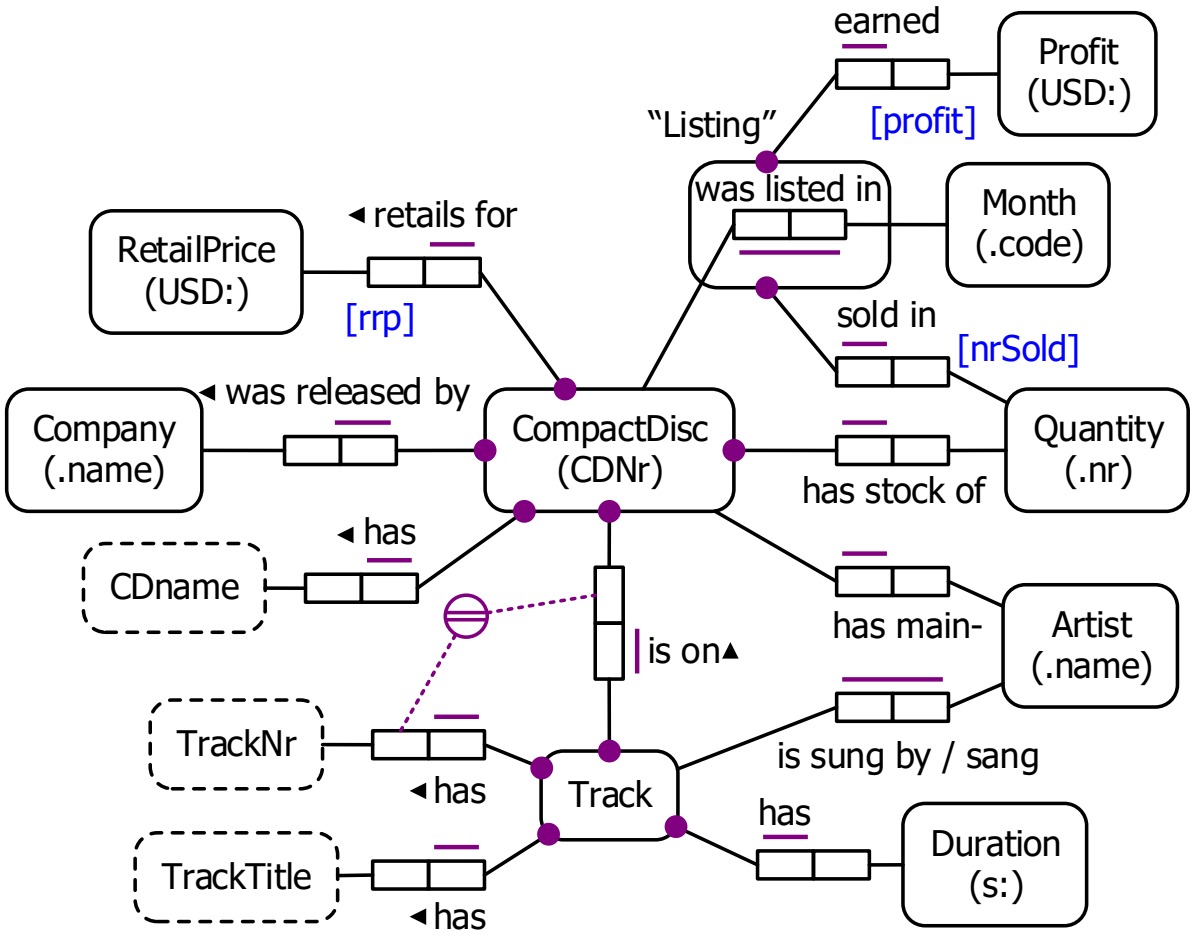
(Nested fact types)



Listing (<u>CDNr, Month</u>, Quantity, Profit)

Case study – Rule 4

(One to one constraint)



n/a for this schema

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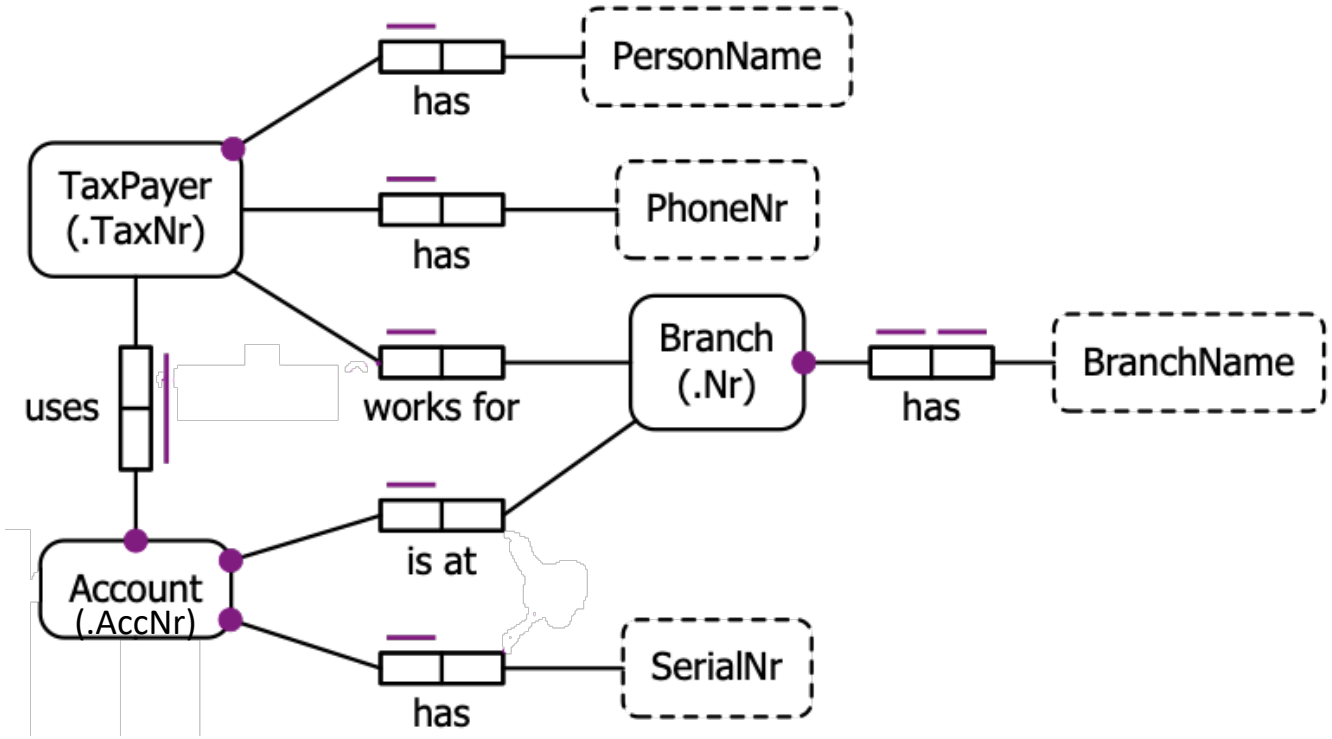
Q5. Apply the Rmapping Procedure to the following diagram



Activity 1

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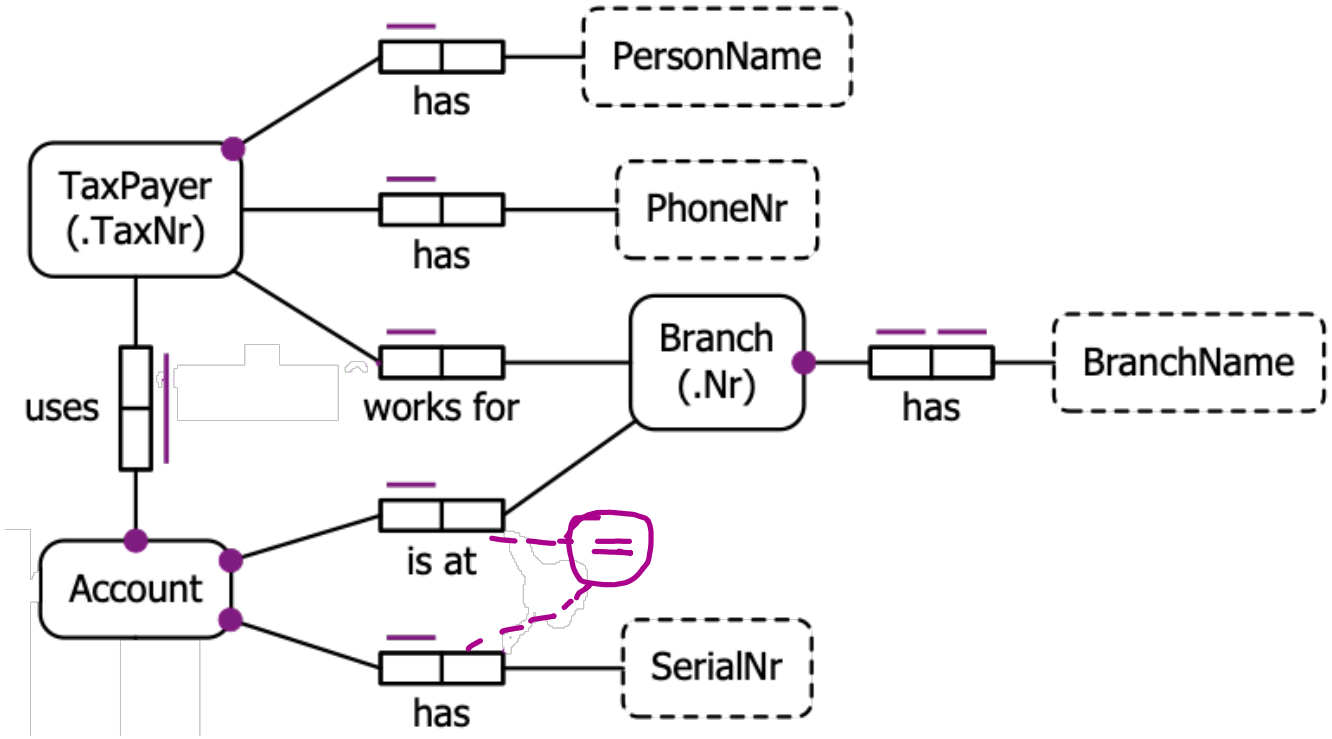
Q6. Apply the Rmapping Procedure to the following diagram



Summary of Constraints

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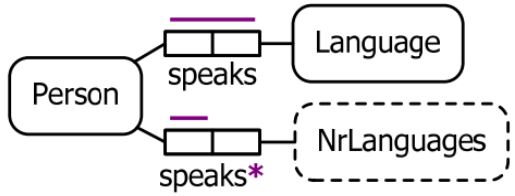
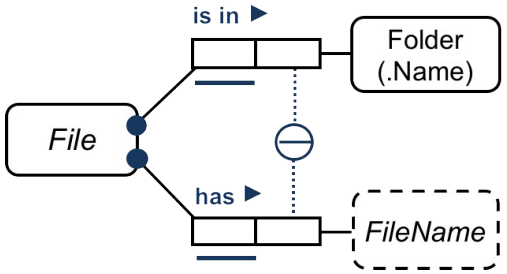
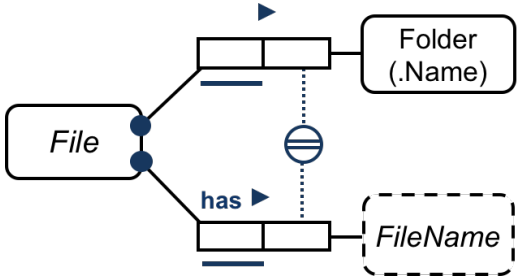
Uniqueness Constraint (UC)		Each object instance plays role zero or one times
External UC		Combination of objects playing roles is unique
Composite Reference Mode		Combination of objects playing roles is unique AND That combination can be used as a reference for the object involved in both facts

Summary of Constraints

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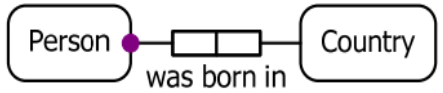
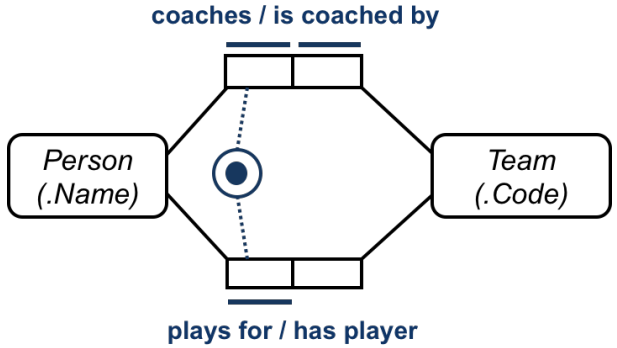
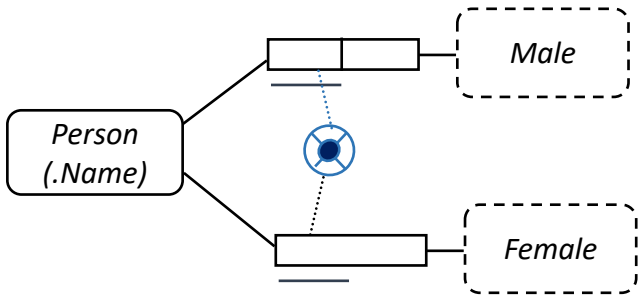
Mandatory Role Constraint		Each object instance must play role one or more times * May affect external entities *
Disjunctive Mandatory Role Constraint		Each object instance must play one role, or the other role, or both roles, one or more times
Mandatory role constraint combined with an exclusion constraint		Each object instance must play one of the roles (not both)

Summary of Constraints

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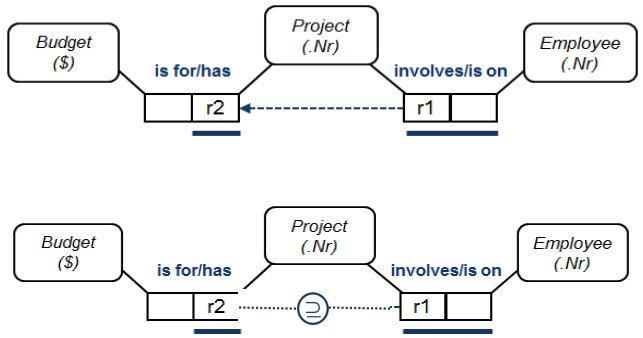
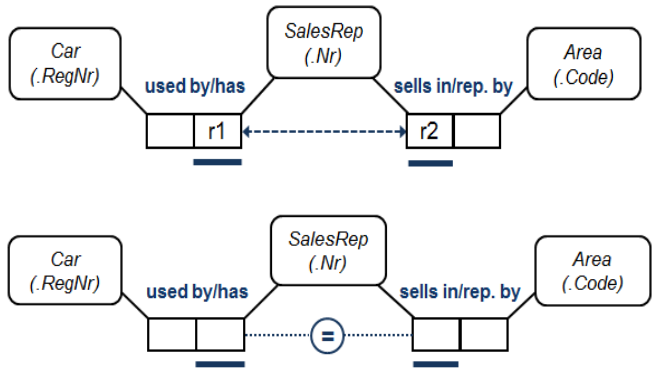
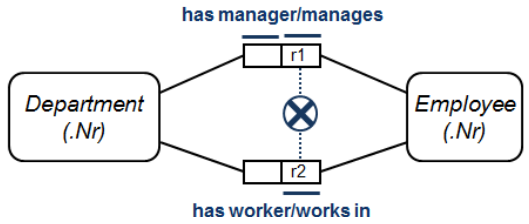
Subset constraint		All objects playing role (*r1*) must also play role (*r2*) but not necessarily vice versa
Equality Constraint		All objects playing role (*r1*) must also play role (*r2*)
Exclusion Constraint		An object that plays one role must not also play the other role

Summary of Constraints

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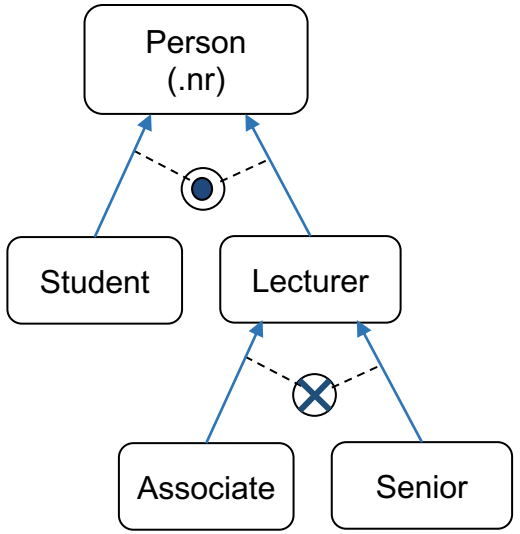
Value constraint	*Gender (.Code)* GenderCode: {'M', 'F'} *Rating (.Nr)* RatingNr: {'1' .. '7'} *ExtremeTemperature (°C:)* ExtremeTemperature: {-100 .. -20, 40 .. 100}	An object has a value which is allowed by the definition of a valid set of values
Subtype constraint		Some entity types need to be combined (e.g., Person), but one or more specific roles are played only by a given subtype (e.g., Lecturer)

Part 2 – More RMapping

Task 1

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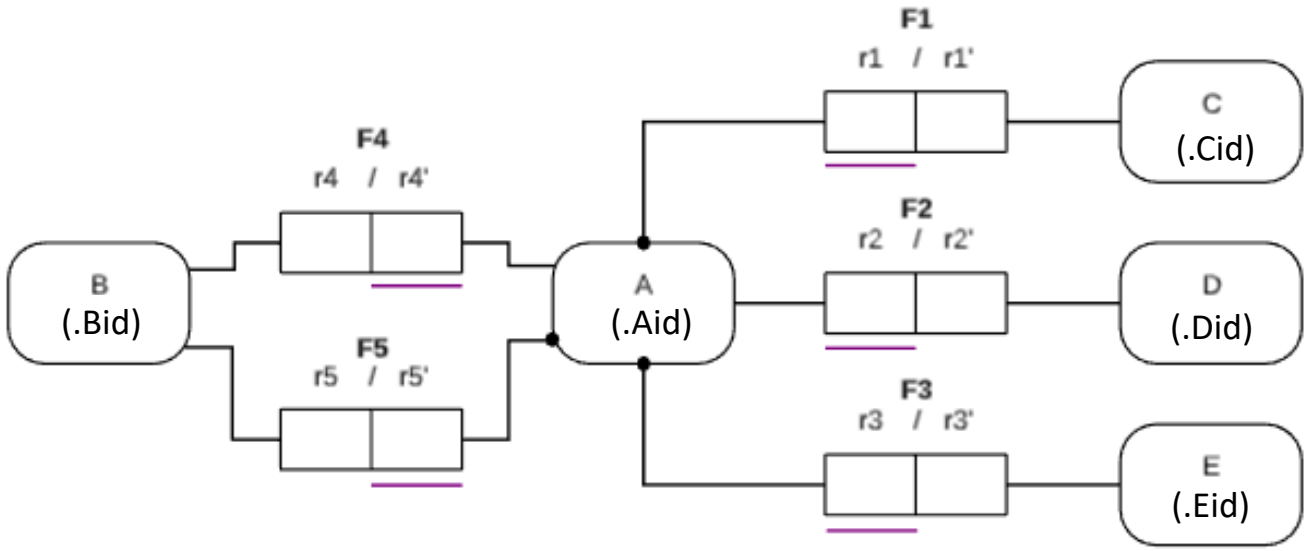
Apply Rmapping to the following diagram



Task 2

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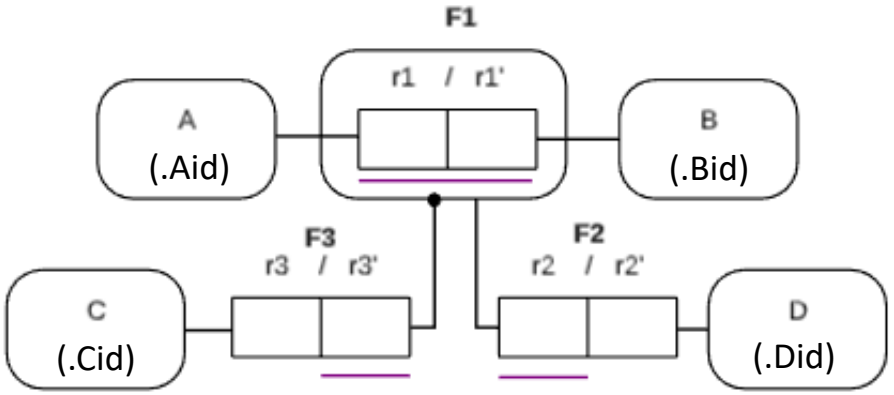
Apply Rmapping to the following diagram



Task 3

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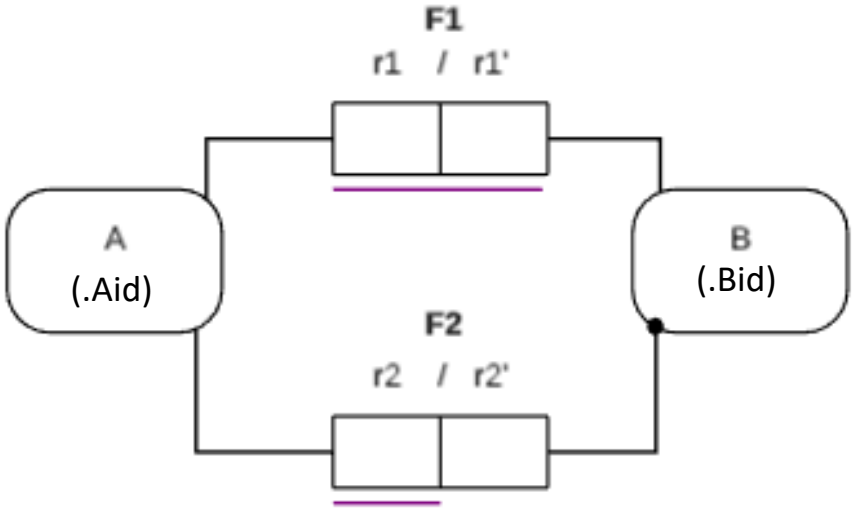
Apply Rmapping to the following diagram



Task 4

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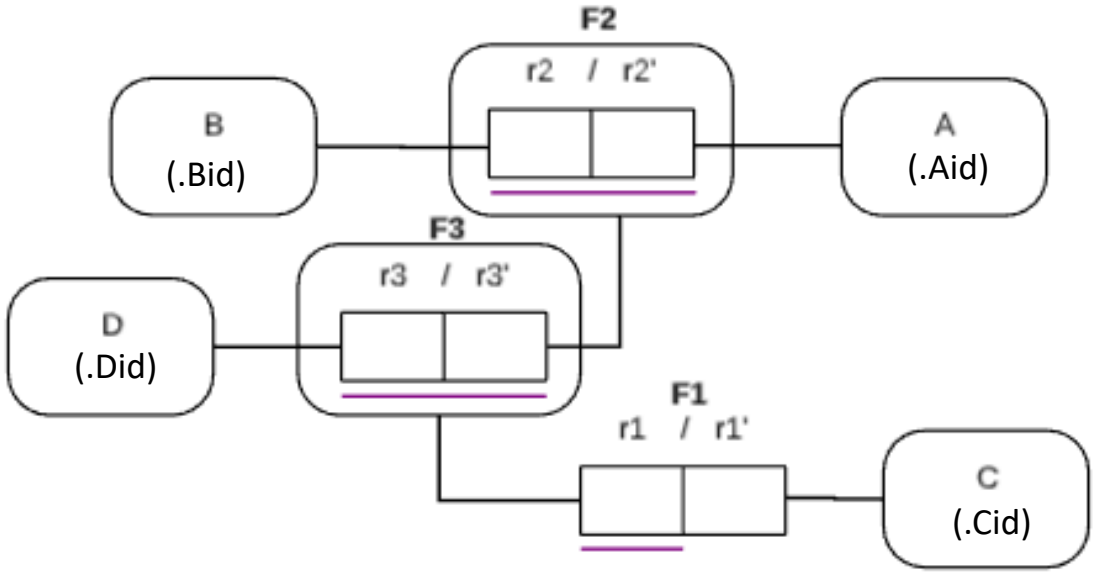
Apply Rmapping to the following diagram



Task 4

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Apply Rmapping to the following diagram

Task 5 - Homework

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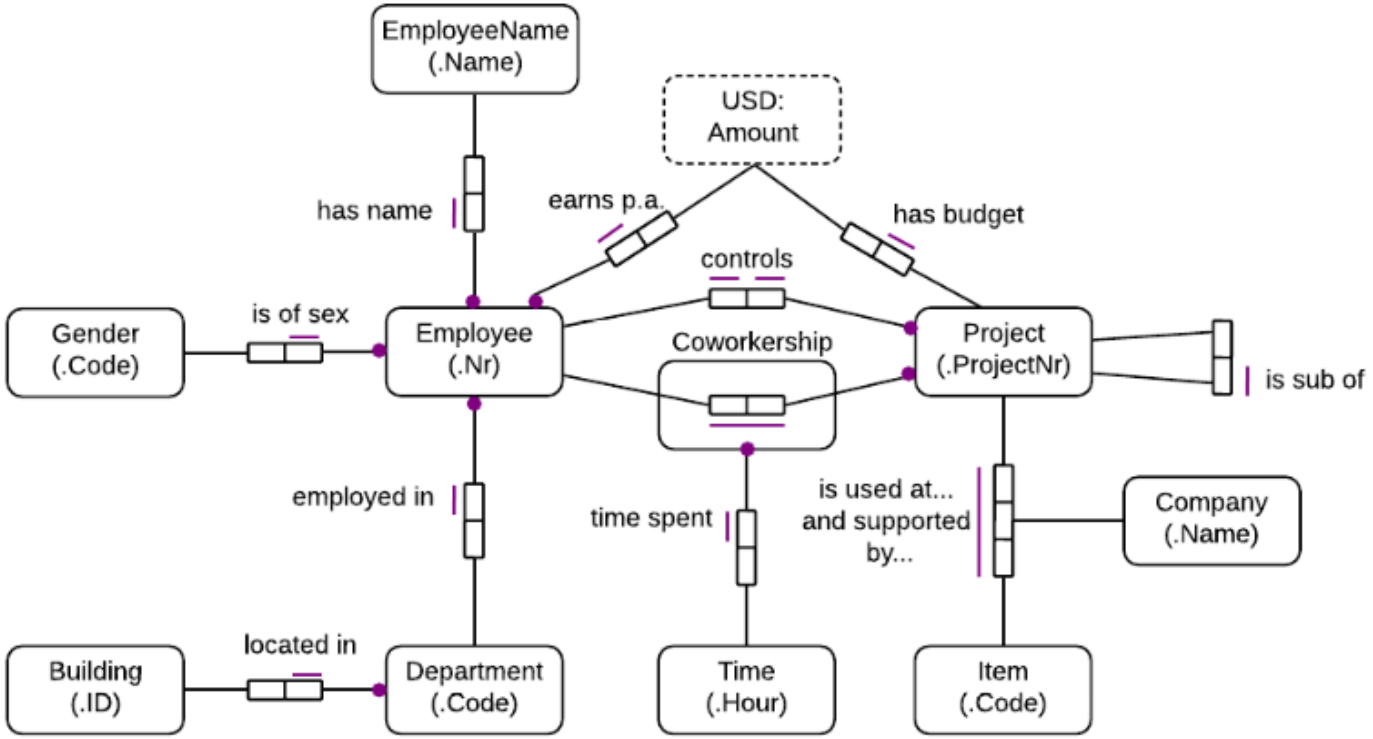
Apply Rmapping to the following diagram



Task 6 - Homework

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Apply Rmapping to the following diagram