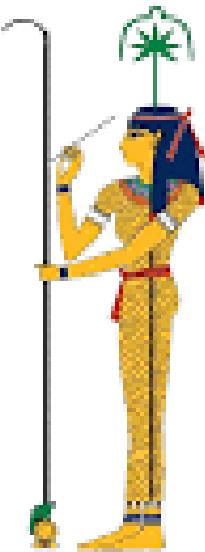




رواد مصر الرقمية

بيانات
وتقنيات مفجّلة



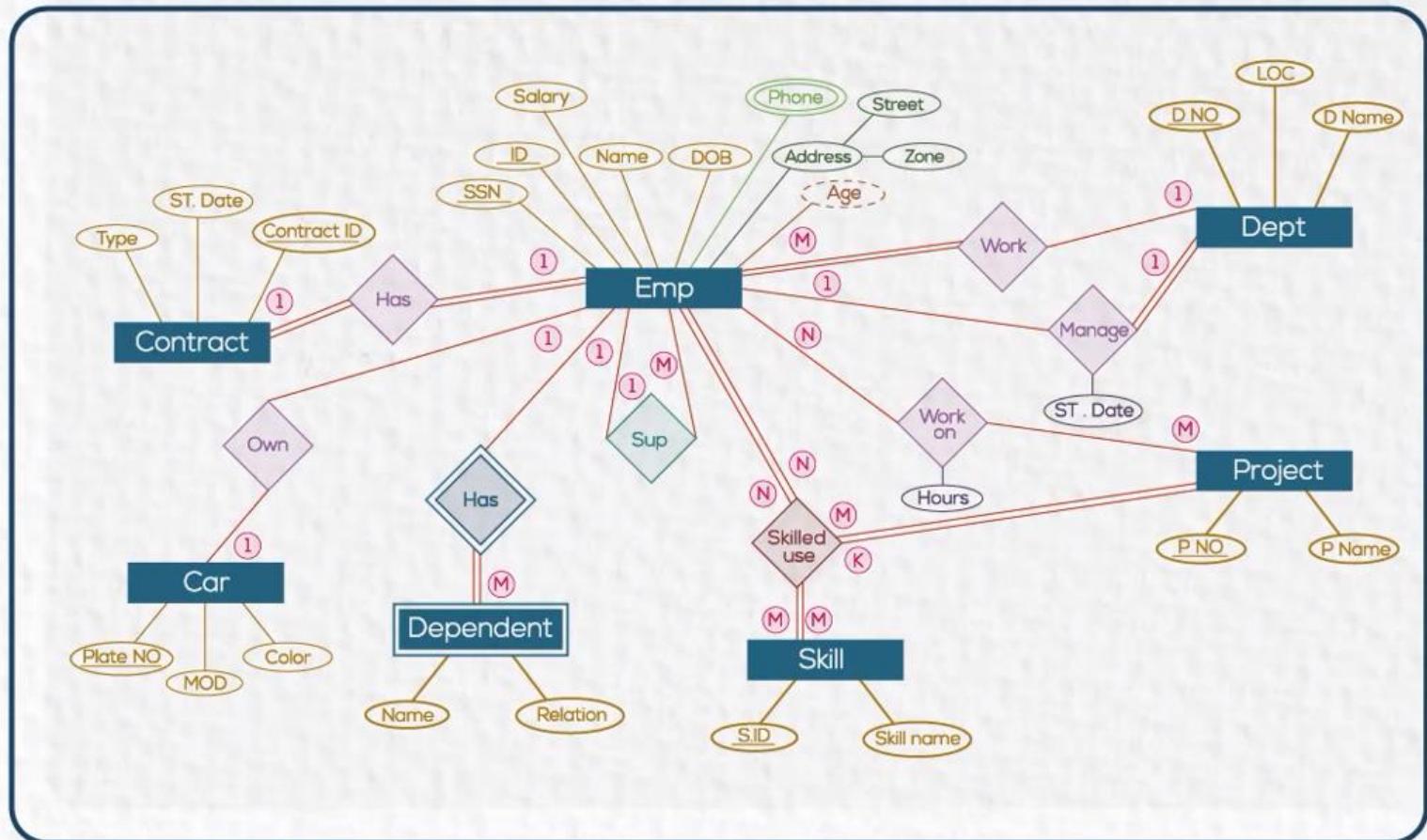
ERD Mapping to Tables

- Step 1: Mapping of Regular Entity Types
- Step 2: Mapping of Weak Entity Types
- Step 3: Mapping of Binary 1:1 Relation Types
- Step 4: Mapping of Binary 1:N Relationship Types.
- Step 5: Mapping of Binary M:N Relationship Types.
- Step 6: Mapping of Multi-valued attributes.
- Step 7: Mapping of N-ary Relationship Types.



logical design

Conceptual design





SSN	Name	Date of birth			
999.9	Doug	7/52			

Tuple



Tuple





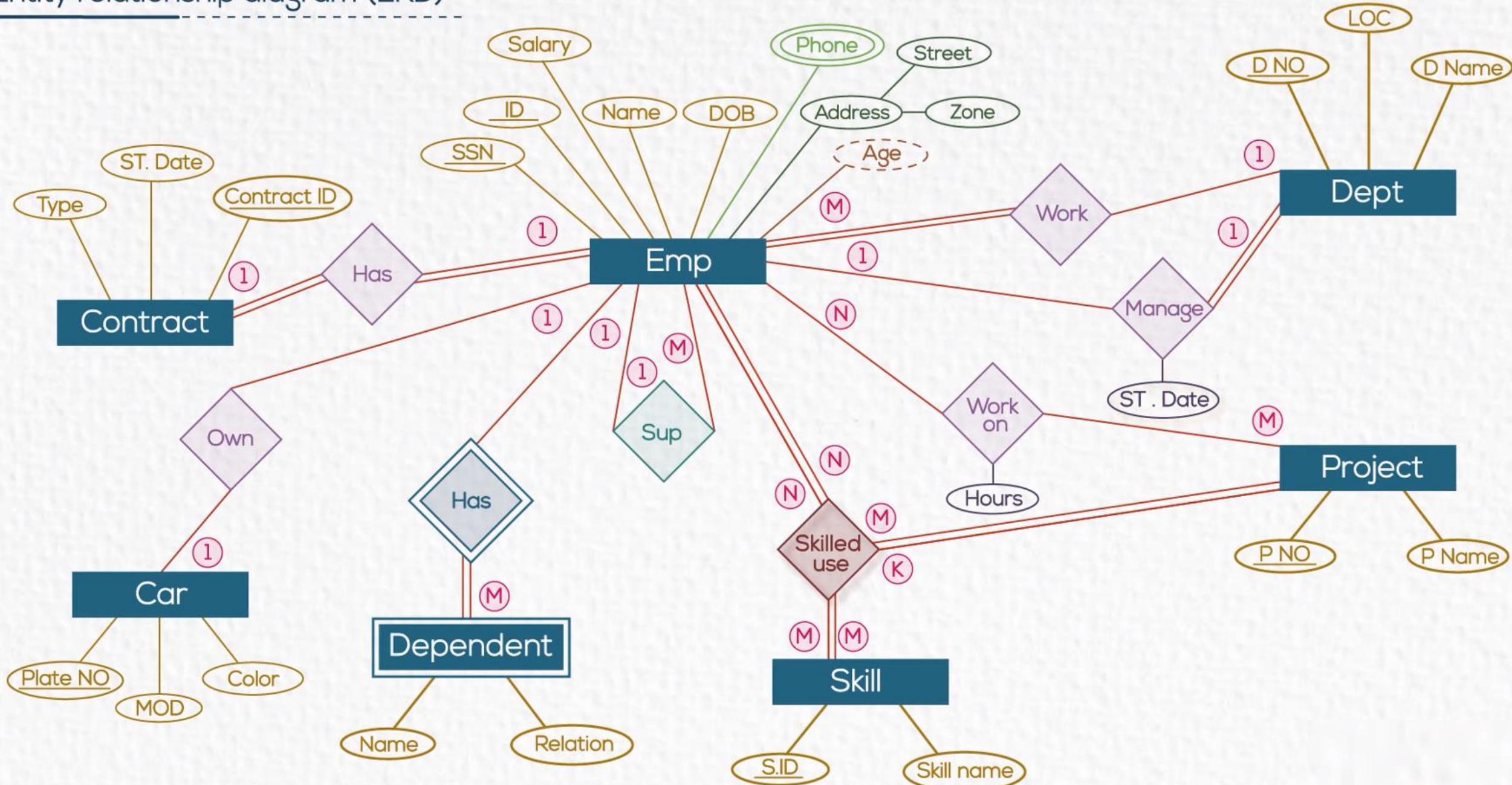
Column





- It must contain a unique value for each row of data.
- It cannot contain null values.

Entity relationship diagram (ERD)



Step 1: Mapping of regular entity types

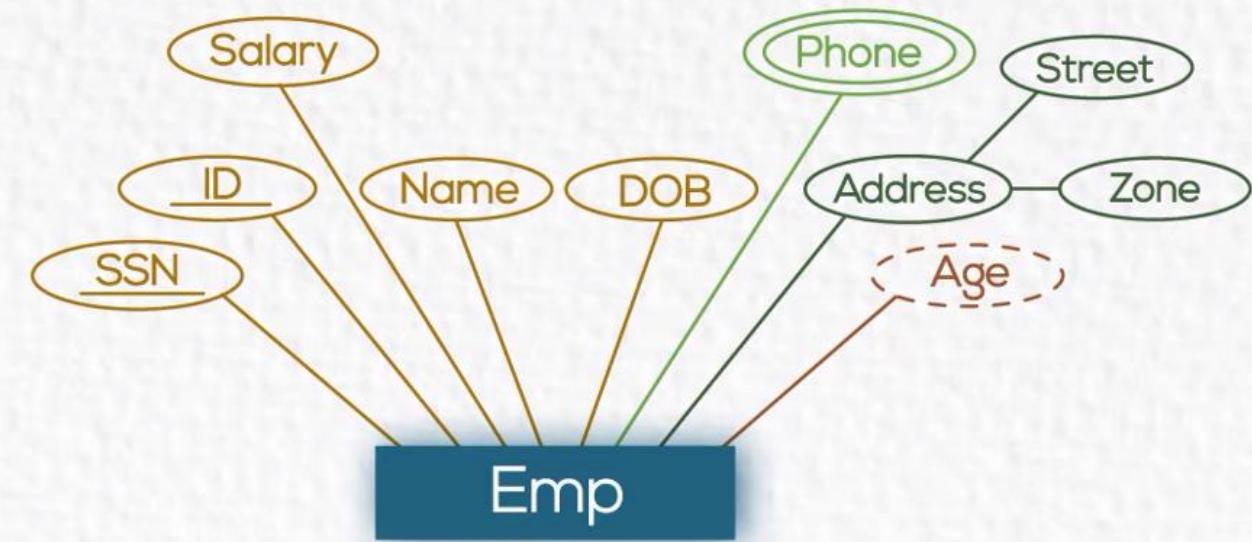
Create table for each entity type

Choose one of key attributes to be
the primary key

Step 1: Mapping of regular entity types

Create table for each entity type

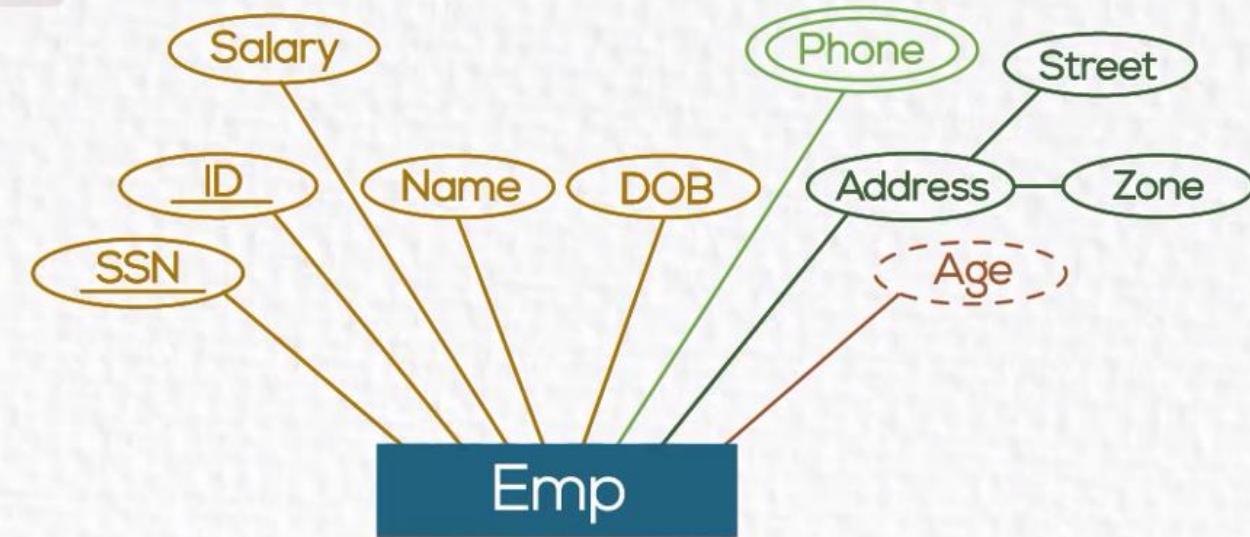
Emp (



Step 1: Mapping of regular entity types

Choose one of key attributes to be the primary key

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

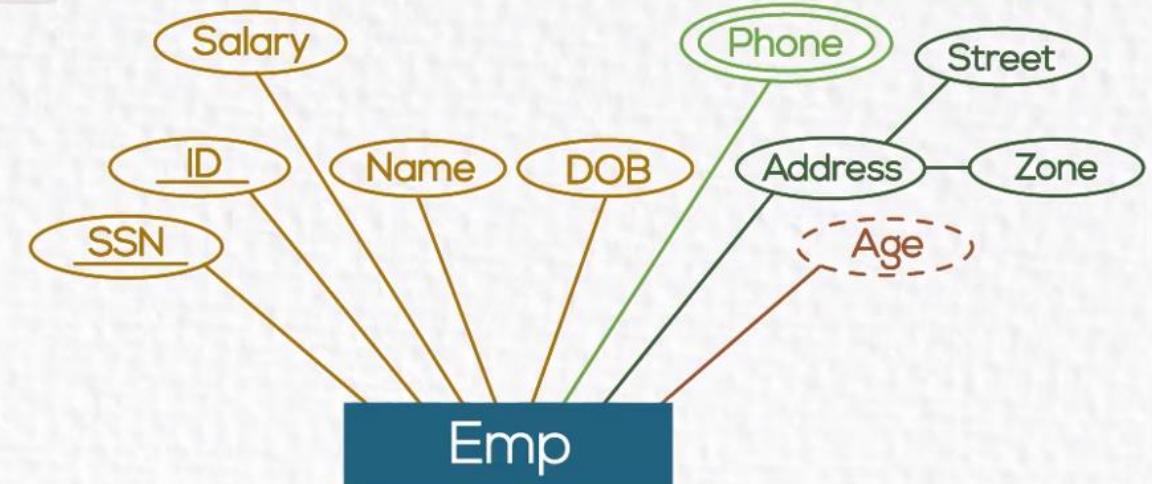




Step 1: Mapping of regular entity types

Choose one of key attributes to be the primary key

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

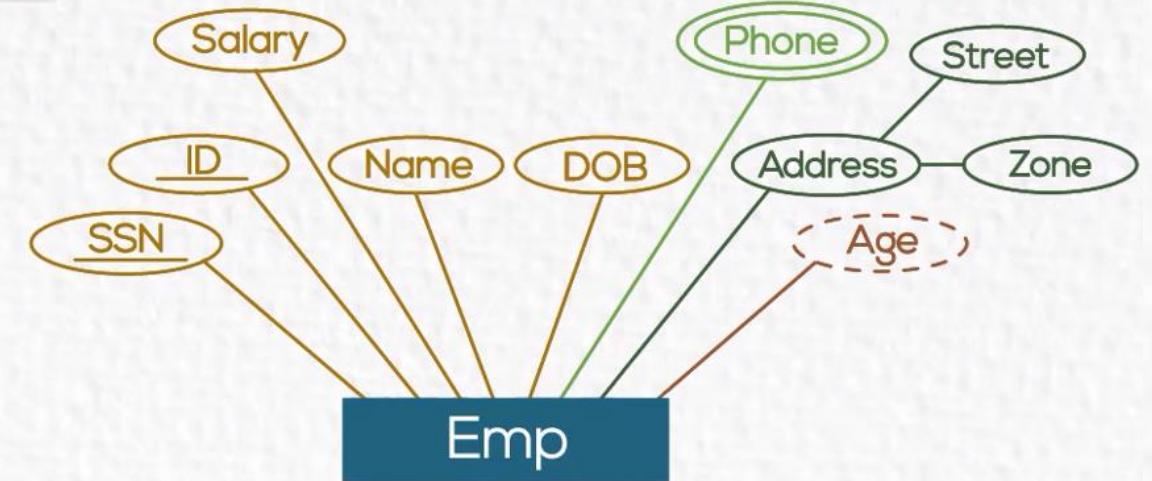


SSN	Name	Phone
123	Ahmed	0245678

Step 1: Mapping of regular entity types

Choose one of key attributes to be the primary key

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

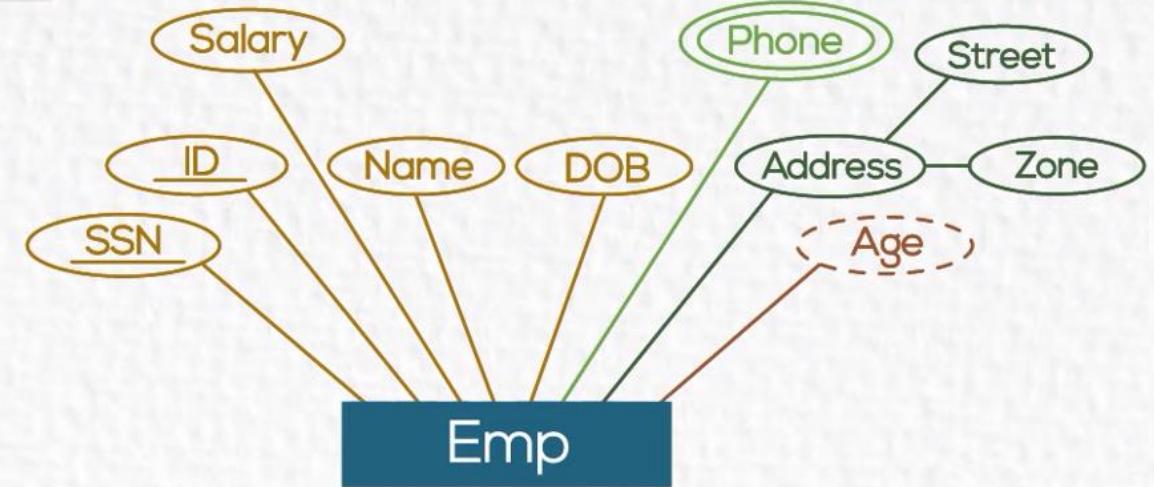


SSN	Name	Phone
123	Ahmed	0245678
123		0159875

Step 1: Mapping of regular entity types

Choose one of key attributes to be the primary key

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)



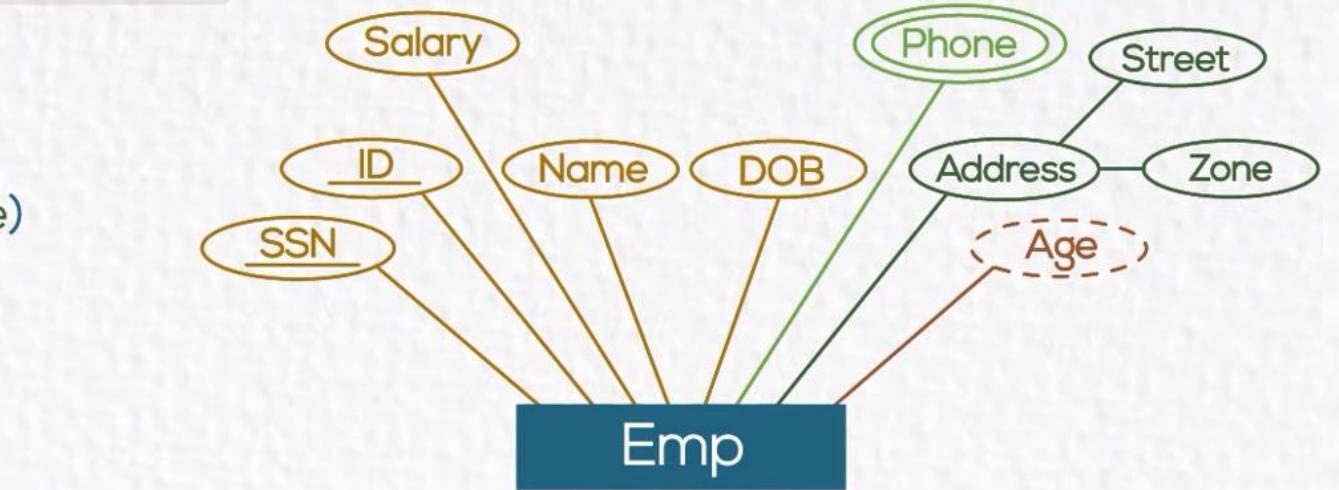
SSN	Name	Phone
123	Ahmed	0245678
123		0159875



Step 1: Mapping of regular entity types

Choose one of key attributes to be the primary key

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)



→

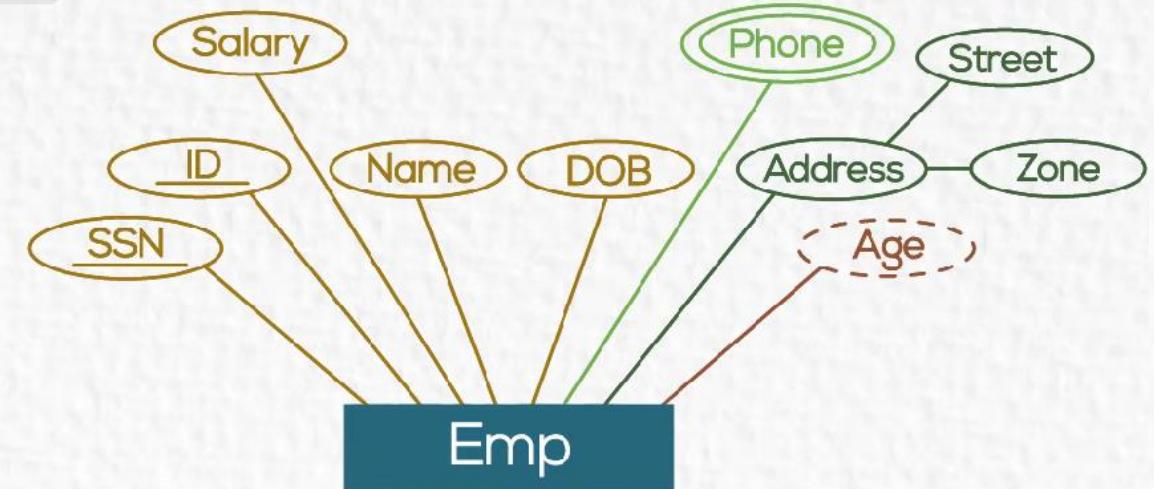
SSN	Name	Phone
123	Ahmed	0245678
		0159875



Step 1: Mapping of regular entity types

Choose one of key attributes to be the primary key

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)



SSN	Name	Phone
123	Ahmed	0245678
		0159875

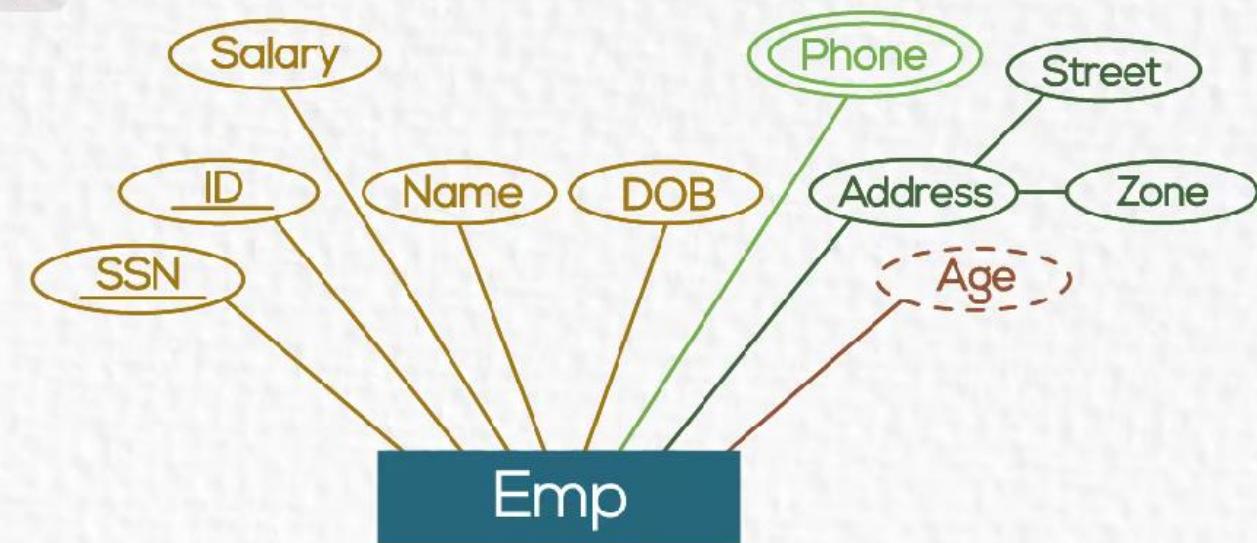
Step 1: Mapping of regular entity types

Choose one of key attributes to be the primary key

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

Emp - Phone (SSN, Phone)

Foreign key



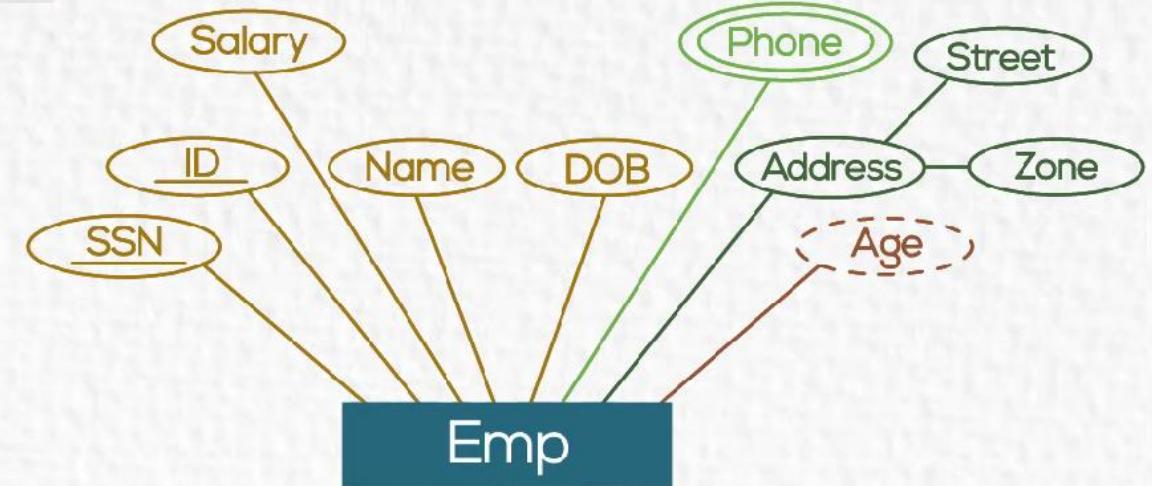


Step 1: Mapping of regular entity types

Choose one of key attributes to be the primary key

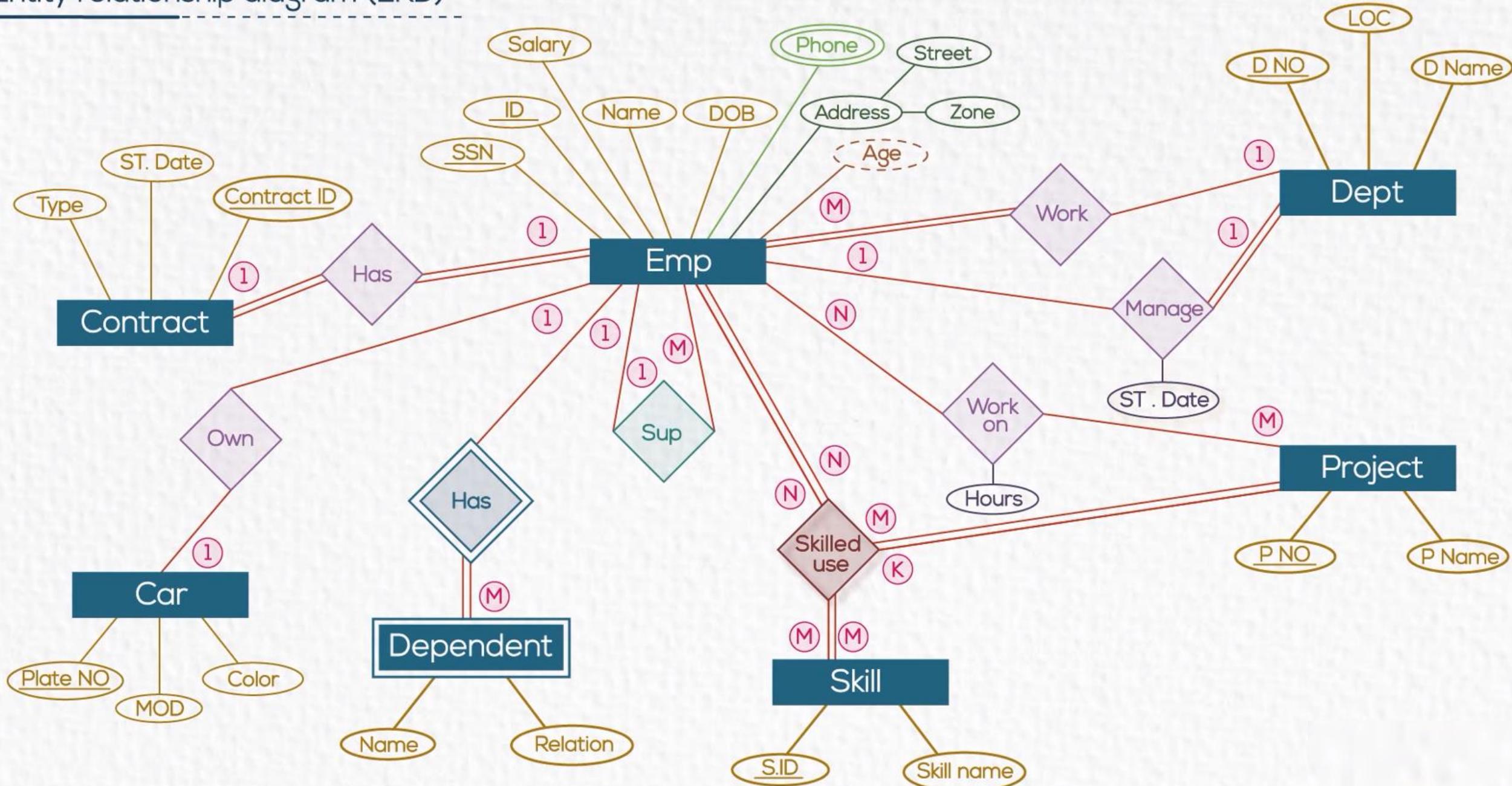
Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

Emp - Phone (SSN, Phone)



SSN	Phone
123	0245678
123	0159875

Entity relationship diagram (ERD)

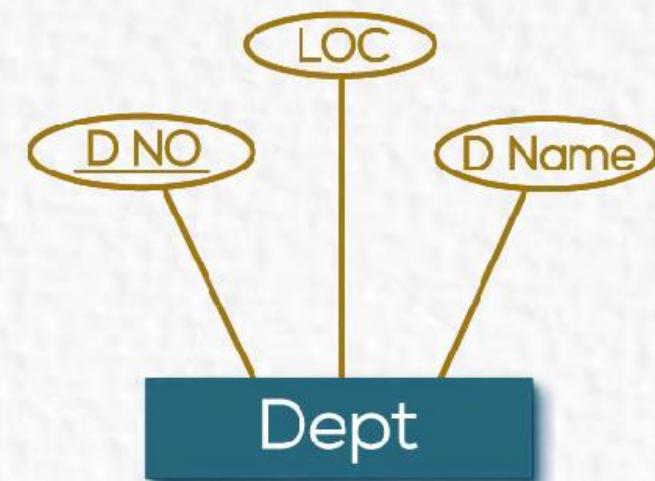


Step 1: Mapping of regular entity types

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

Emp - Phone (SSN, Phone)

Dept (

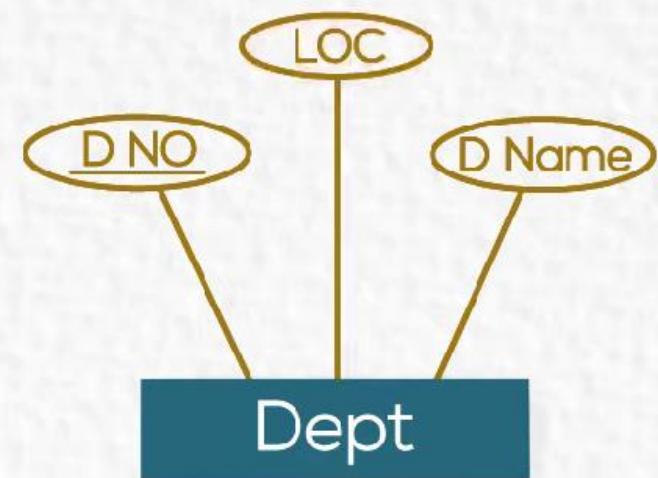


Step 1: Mapping of regular entity types

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC)



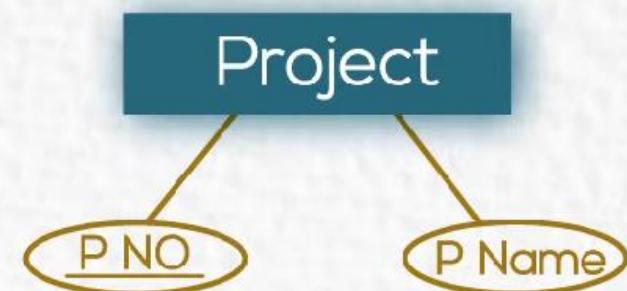
Step 1: Mapping of regular entity types

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC)

Project (



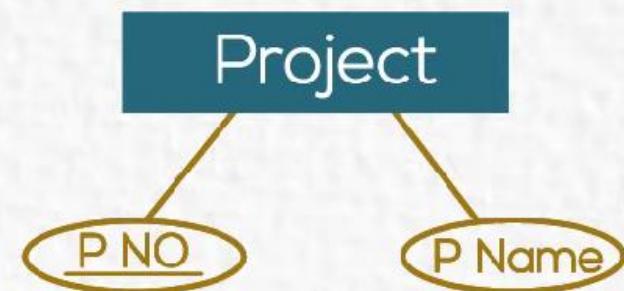
Step 1: Mapping of regular entity types

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

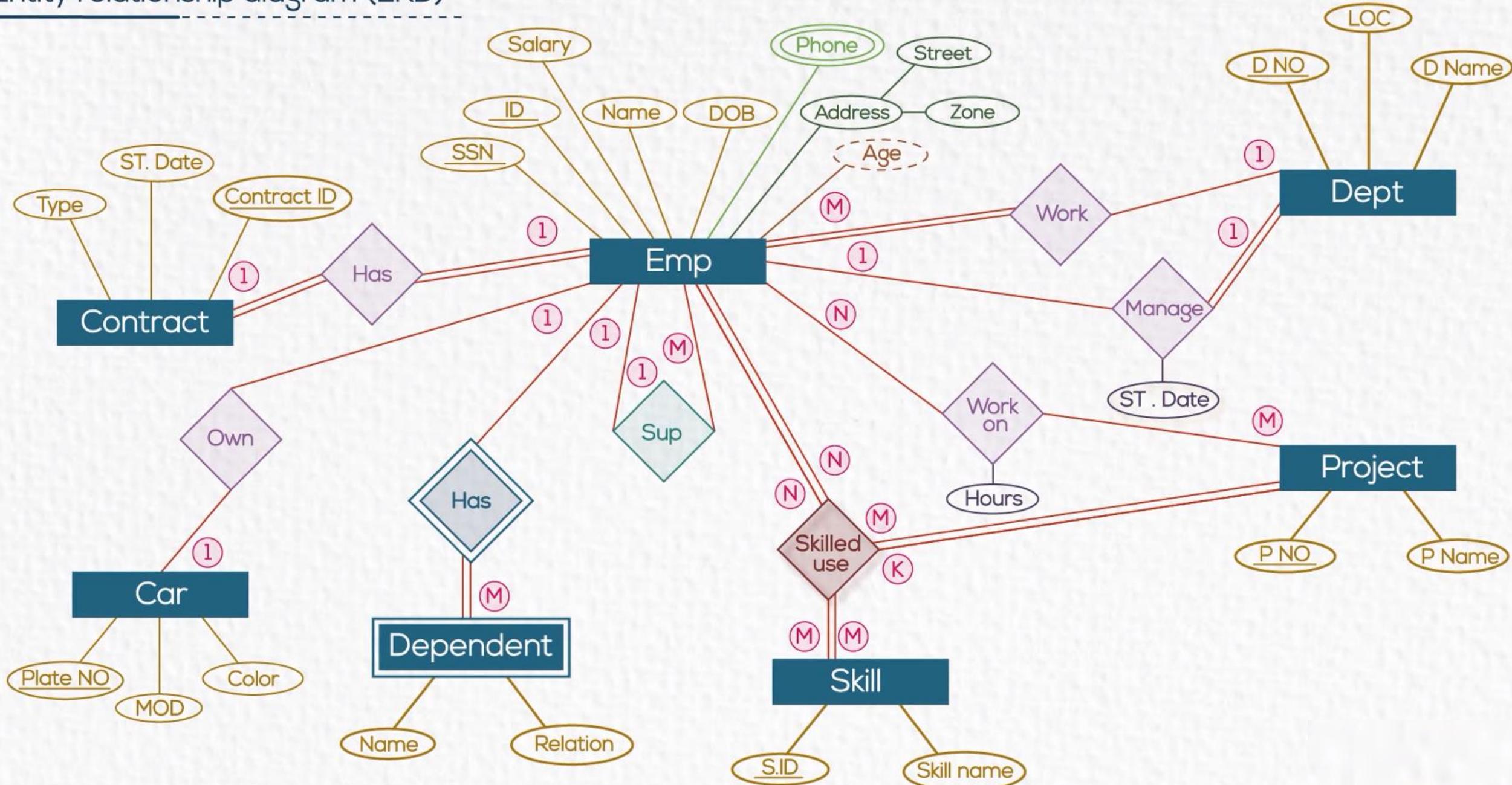
Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC)

Project (PNO, P Name)



Entity relationship diagram (ERD)



Step 2: Mapping of weak entity types

Create table for each weak entity

Choose the primary key: (FK + weak entity Partial PK if any)

Add foreign key that correspond to the owner entity type.

Dependent

Name

Relation

Step 2: Mapping of weak entity types

Choose the primary key: (FK + weak entity Partial PK if any)

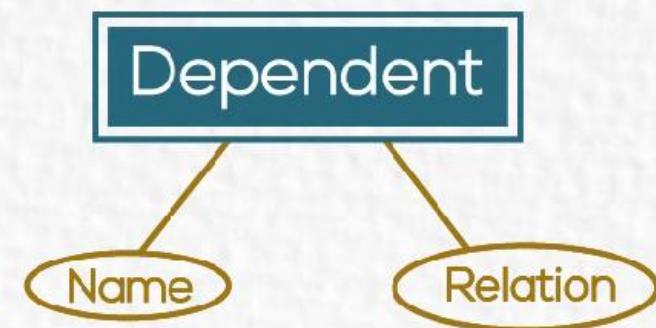
Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC)

Project (PNO, P Name)

Dependent (SSN, Name, Relation)



Step 2: Mapping of weak entity types

Choose the primary key: (FK + weak entity Partial PK if any)

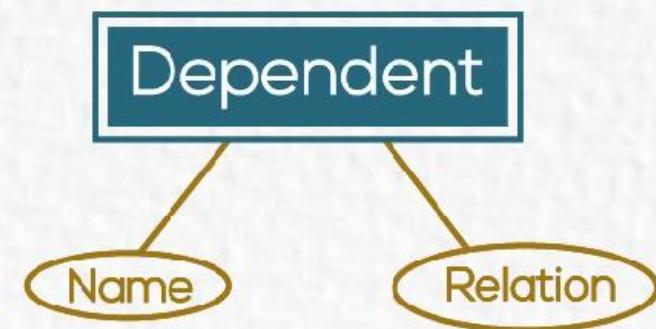
Emp (**ID**, SSN, Salary, Name, DOB, Street, Zone)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC)

Project (PNO, P Name)

Dependent (SSN, Name, Relation)





Step 1: Mapping of regular entity types

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

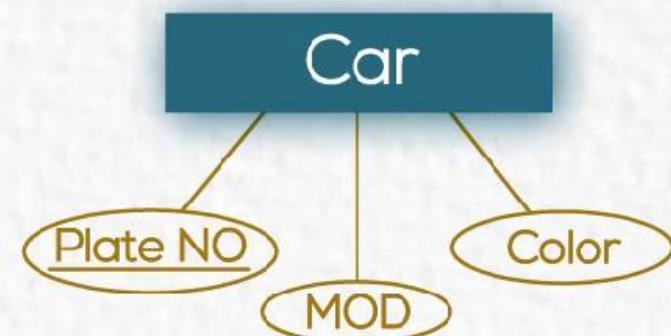
Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC)

Project (PNO, P Name)

Dependent (SSN, Name, Relation)

Car (





Step 1: Mapping of regular entity types

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

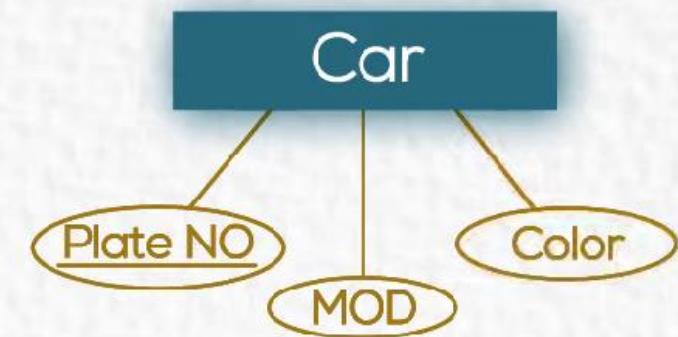
Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC)

Project (PNO, P Name)

Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)





Step 1: Mapping of regular entity types

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

Emp - Phone (SSN, Phone)

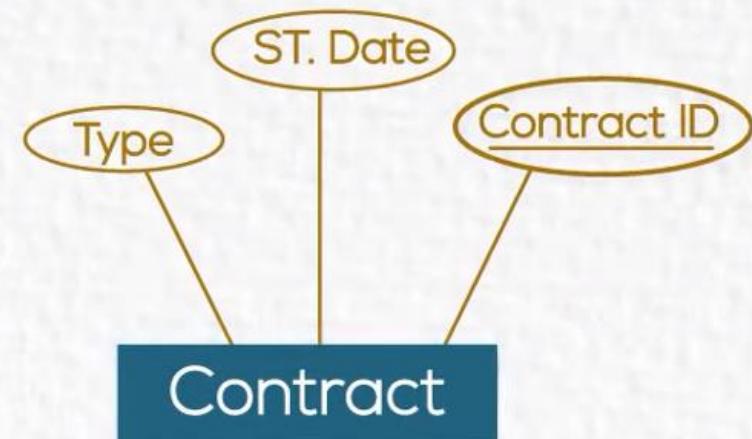
Dept (DNO, D Name, LOC)

Project (PNO, P Name)

Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

Contract (





Step 1: Mapping of regular entity types

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

Emp - Phone (SSN, Phone)

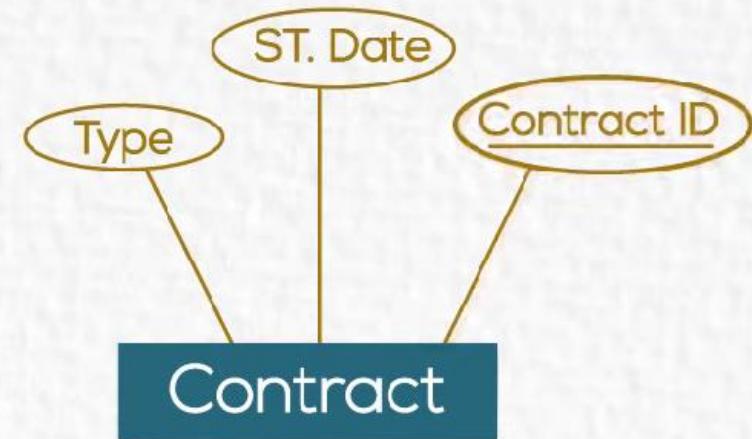
Dept (DNO, D Name, LOC)

Project (PNO, P Name)

Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

Contract (Contract_ID, Type, Start_date)





Step 1: Mapping of regular entity types

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC)

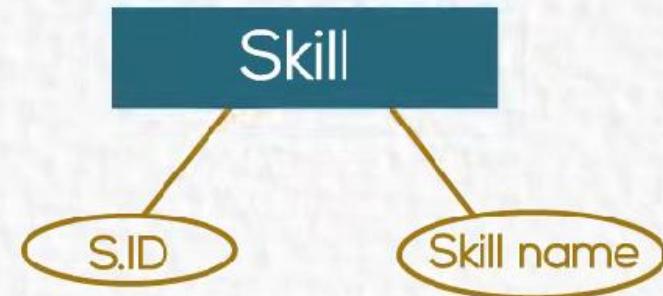
Project (PNO, P Name)

Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

Contract (Contract_ID, Type, Start_date)

Skill (Skill_id, Skill_name)



Step 1: Mapping of regular entity types

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC)

Project (PNO, P Name)

Car (Plate_NO, Model, Color)

Contract (Contract_ID, Type, Start_date)

Skill (Skill_id, Skill_name)

Step 1: Mapping of regular entity types

Step 2: Mapping of weak entity types

Emp (ID, SSN, Salary, Name, DOB, Street, Zone)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC)

Project (PNO, P Name)

Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

Contract (Contract_ID, Type, Start_date)

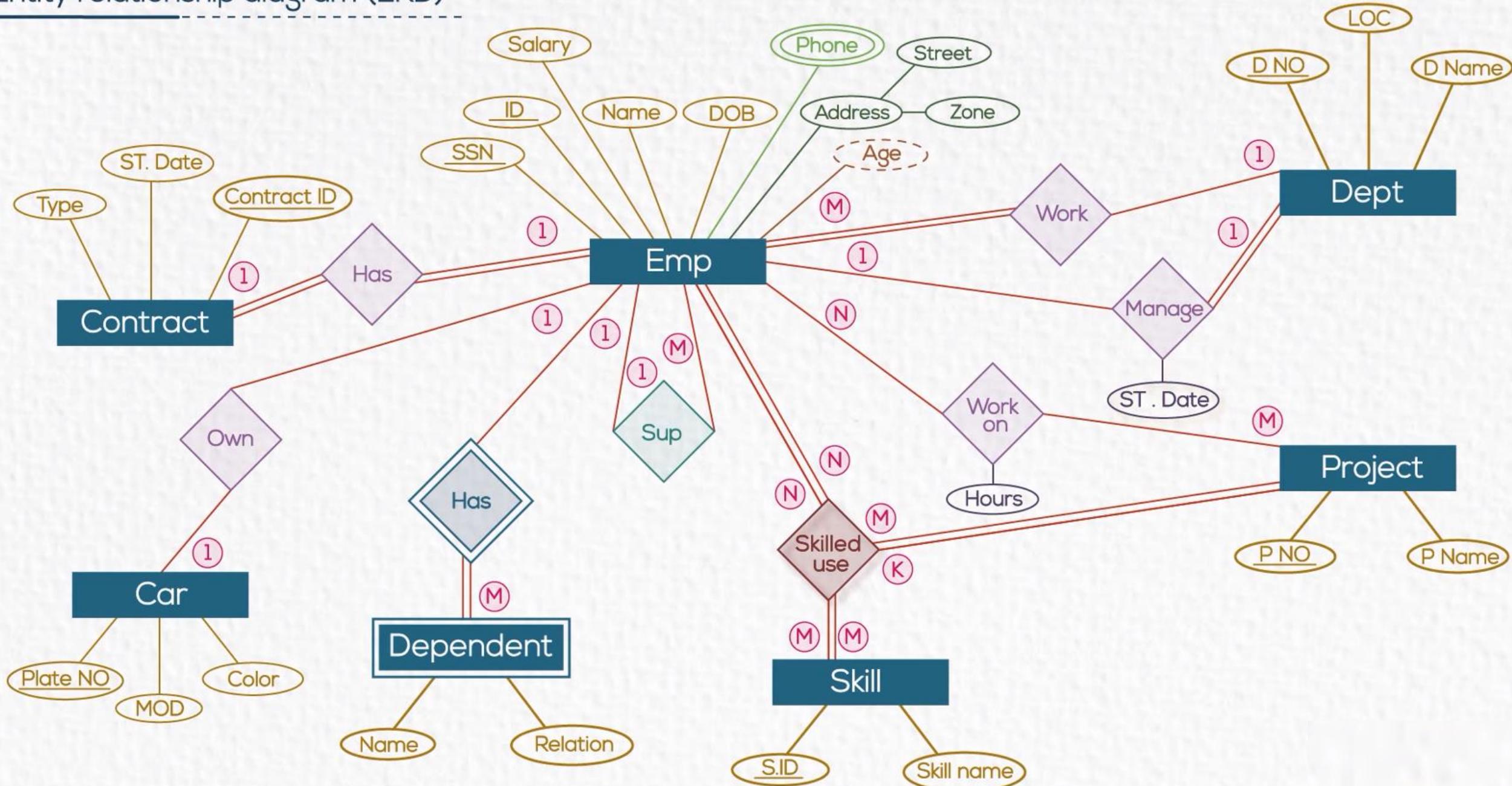
Skill (Skill_id, Skill_name)

ERD Mapping to Tables

- Step 1: Mapping of Regular Entity Types
- Step 2: Mapping of Weak Entity Types
- Step 3: Mapping of Binary 1:1 Relation Types
- Step 4: Mapping of Binary 1:N Relationship Types.
- Step 5: Mapping of Binary M:N Relationship Types.
- Step 6: Mapping of Multi-valued attributes.
- Step 7: Mapping of N-ary Relationship Types.

Step 3: Mapping of relationship types

Entity relationship diagram (ERD)



Step 3: Mapping of relationship types **Binary / Unary 1:N**

Add FK to N-side table

Emp (**ID**, SSN, Salary, Name, DOB, Street, Zone)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC)

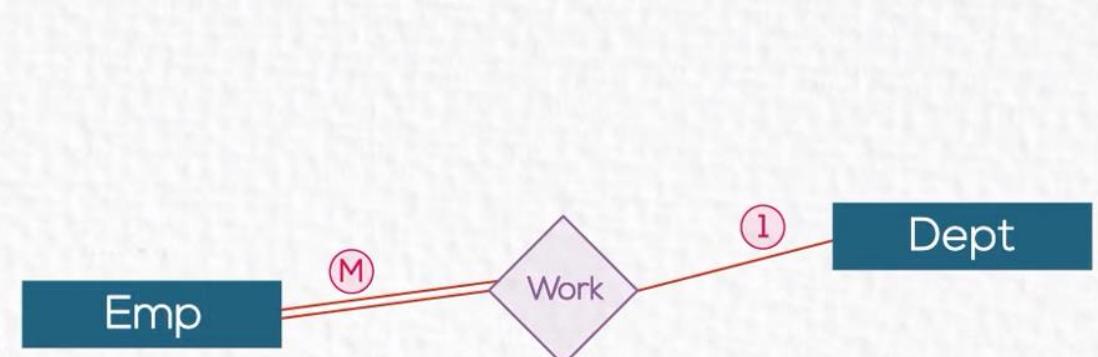
Project (PNO, P Name)

Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

Contract (Contract_ID, Type, Start_date)

Skill (Skill_id, Skill_name)



Step 3: Mapping of relationship types **Binary / Unary 1:N**

Add FK to N-side table

Emp (ID, SSN, Salary, Name, DOB, Street, Zone DNO)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC, ID)

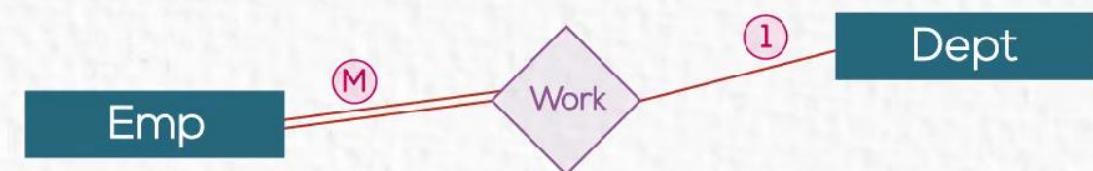
Project (PNO, P Name)

Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

Contract (Contract_ID, Type, Start_date)

Skill (Skill_id, Skill_name)



Step 3: Mapping of relationship types **Binary / Unary 1:N**

Add FK to N-side table

Emp (ID, SSN, Salary, Name, DOB, Street, Zone DNO)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC, ID)

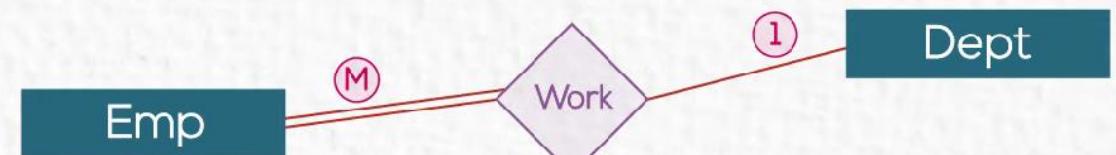
Project (PNO, P Name)

Dependent (SSN, Name, Relation)

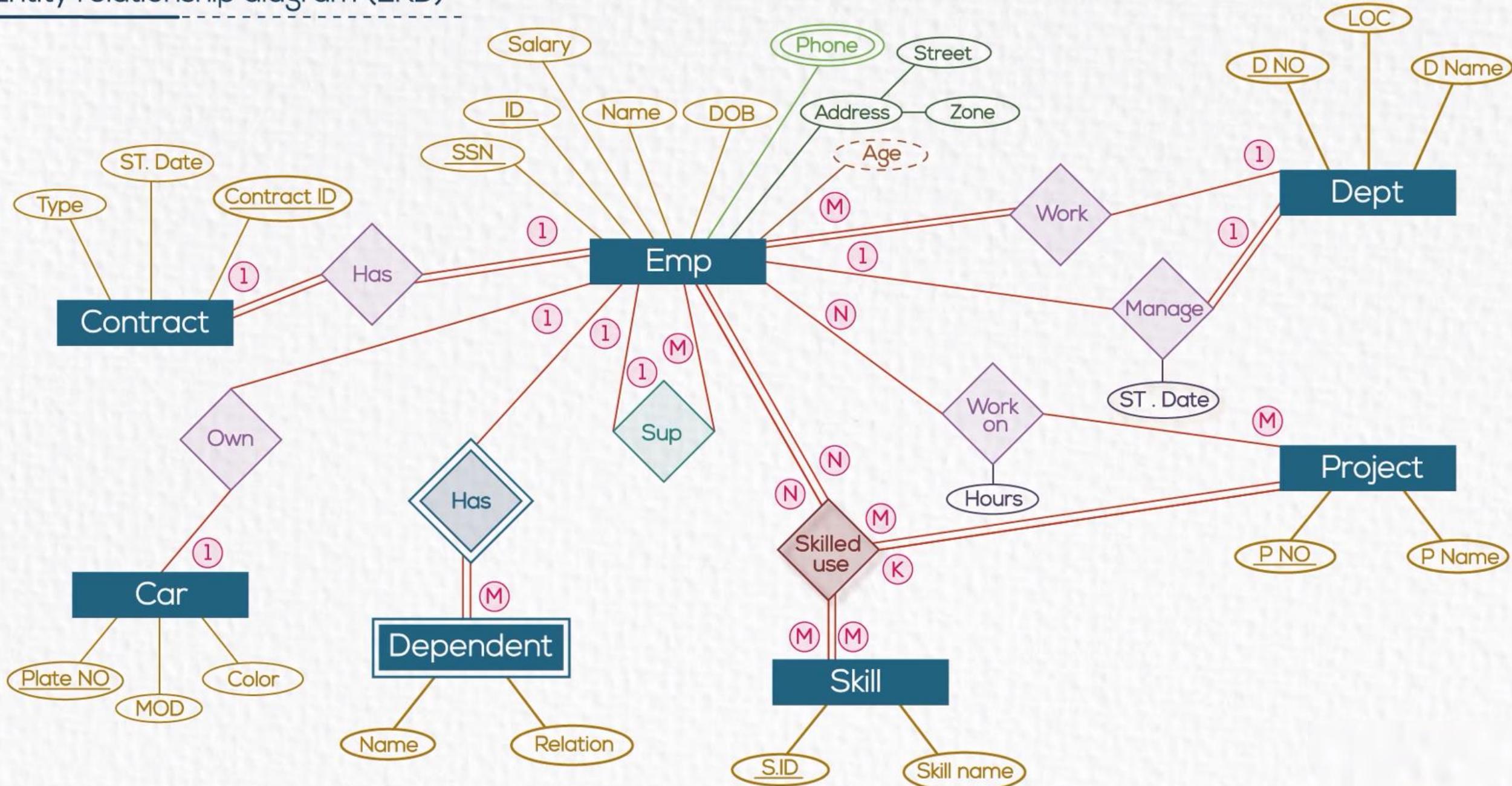
Car (Plate_NO, Model, Color)

Contract (Contract_ID, Type, Start_date)

Skill (Skill_id, Skill_name)



Entity relationship diagram (ERD)



Step 3: Mapping of relationship types **Binary / Unary 1:N**

Add FK to N-side table

Emp (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, SSN)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC)

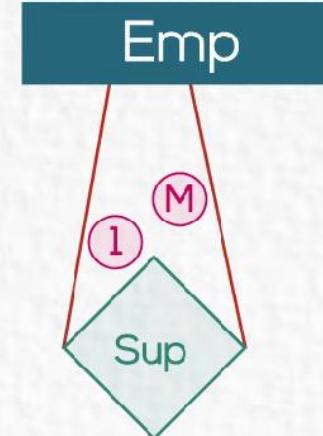
Project (PNO, P Name)

Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

Contract (Contract_ID, Type, Start_date)

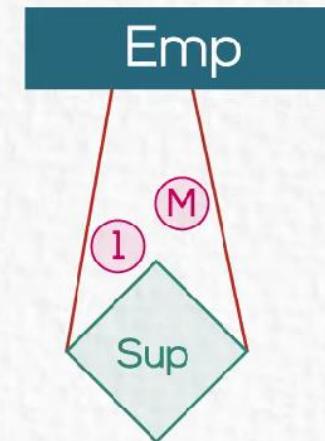
Skill (Skill_id, Skill_name)



Step 3: Mapping of relationship types **Binary / Unary 1:N**

Add FK to N-side table

- Emp (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, Sup-SSN)
- Emp - Phone (SSN, Phone)
- Dept (DNO, D Name, LOC)
- Project (PNO, P Name)
- Dependent (SSN, Name, Relation)
- Car (Plate_NO, Model, Color)
- Contract (Contract_ID, Type, Start_date)
- Skill (Skill_id, Skill_name)



Step 3: Mapping of relationship types **Binary / Unary 1:N**

Add FK to N-side table

Emp (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, Sup-SSN)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC)

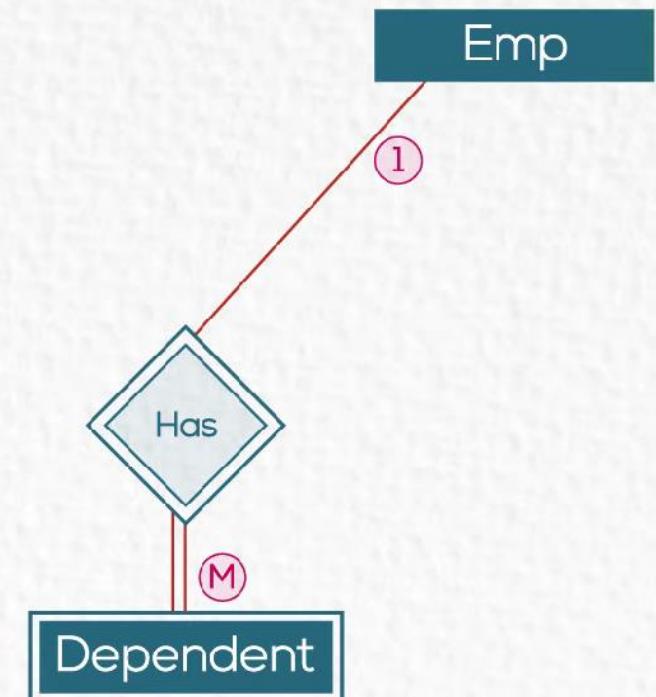
Project (PNO, P Name)

Dependent (SSN, Name, Relation)

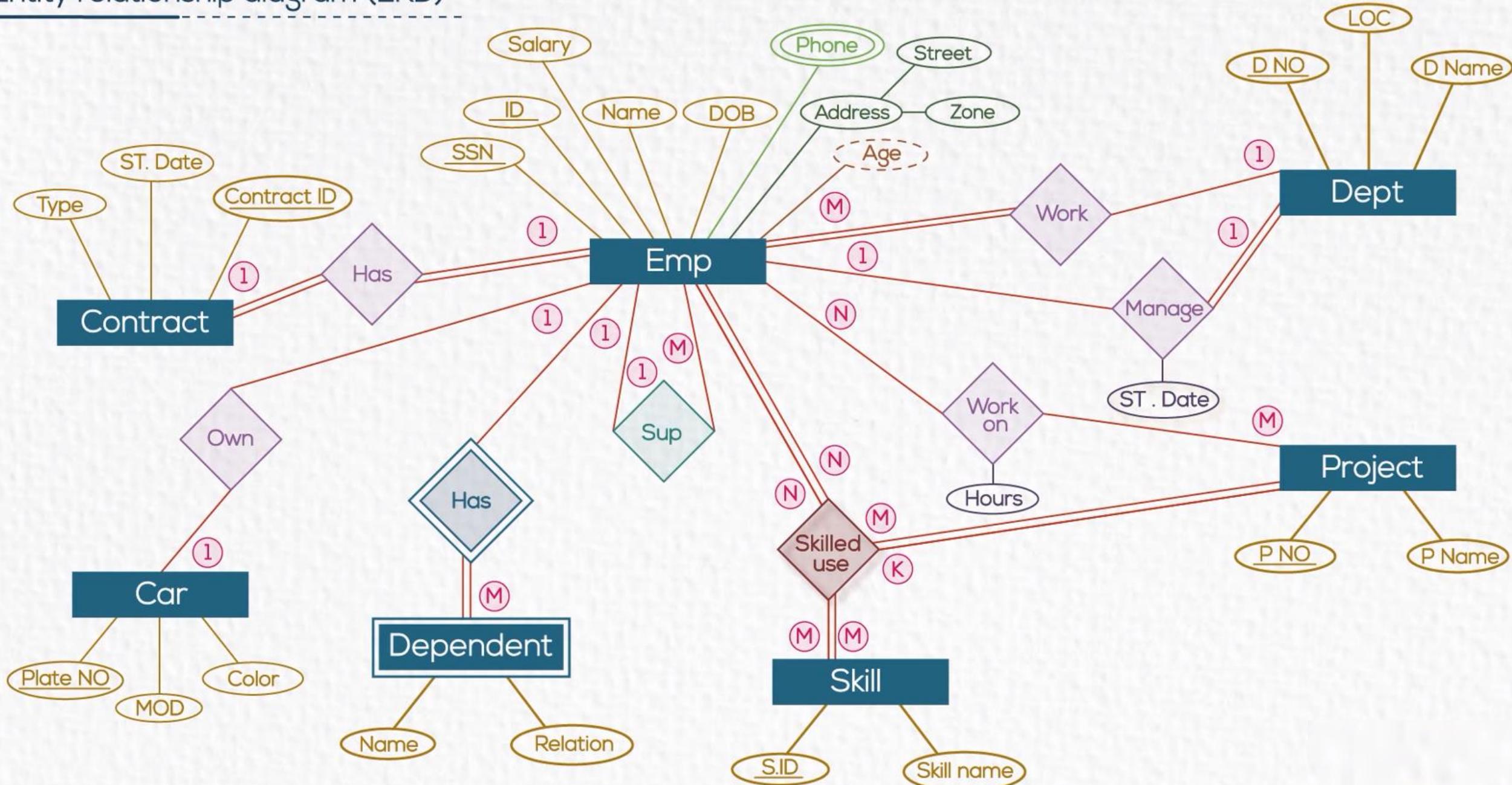
Car (Plate_NO, Model, Color)

Contract (Contract_ID, Type, Start_date)

Skill (Skill_id, Skill_name)



Entity relationship diagram (ERD)



Step 4: Mapping of relationship types **Binary / Unary M:N**

Add FKs to the new table for both parent tables

Emp (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, Sup-SSN)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC)

Project (PNO, P Name)

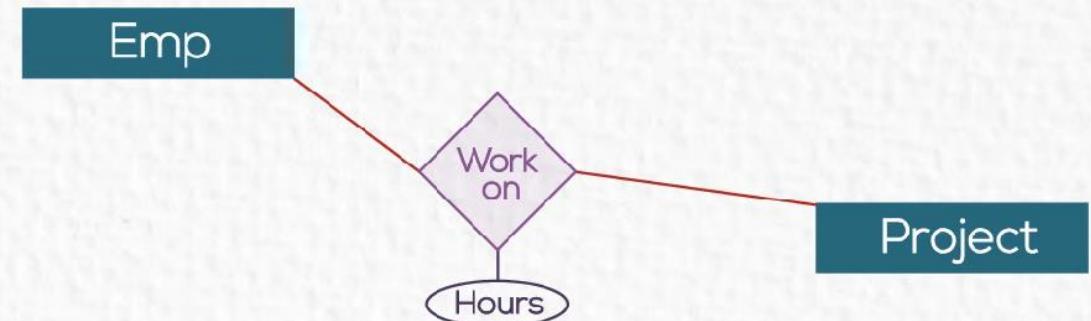
Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

Contract (Contract_ID, Type, Start_date)

Skill (Skill_id, Skill_name)

Work_On (



Emp (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, Sup-SSN)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC)

Project (PNO, P Name)

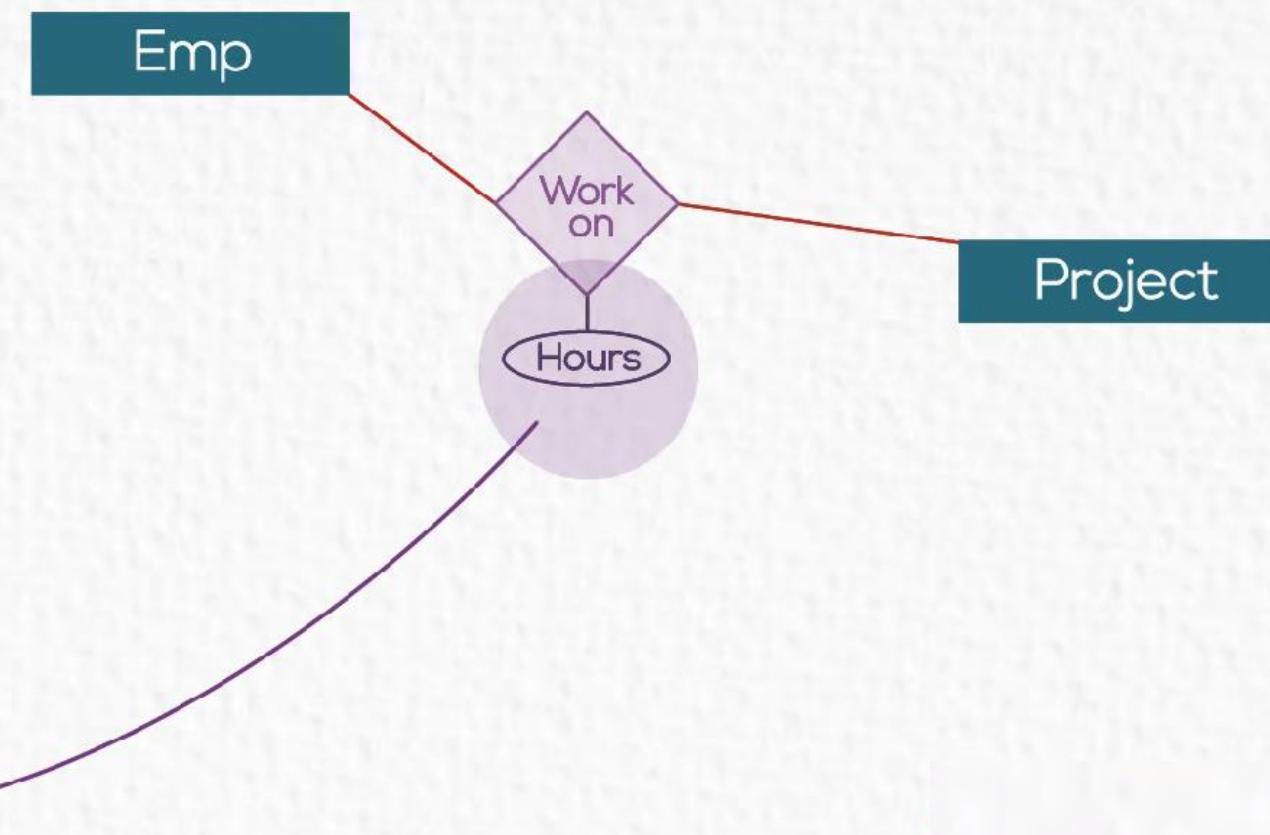
Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

Contract (Contract_ID, Type, Start_date)

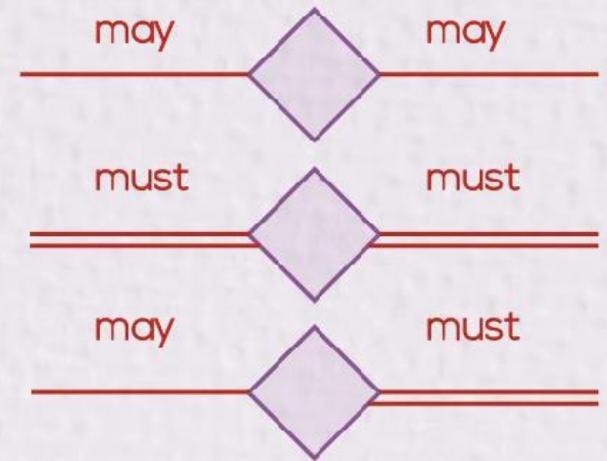
Skill (Skill_id, Skill_name)

Work_On (SSN, PNO, Hours)

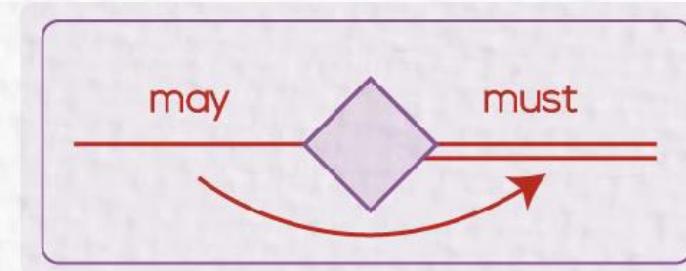




Step 5: Mapping of relationship types **Binary / Unary 1:1**



Step 5: Mapping of relationship types **Binary / Unary 1:1**



Emp (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, Sup-SSN)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC,

Project (PNO, P Name)

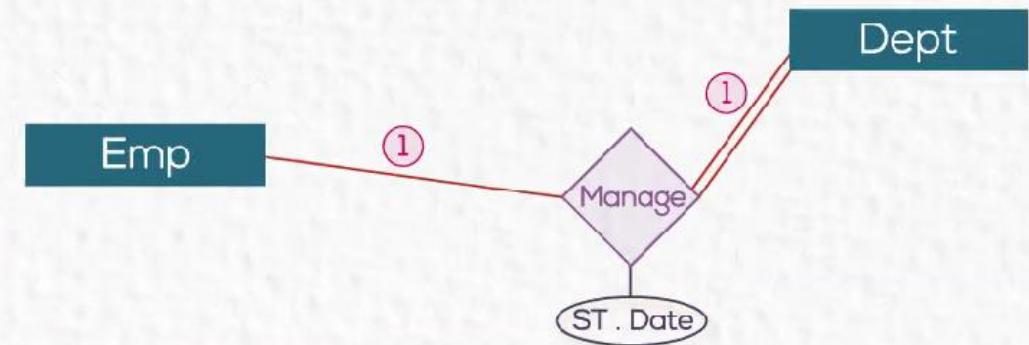
Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

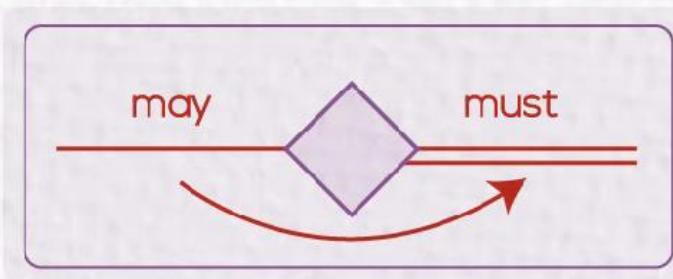
Contract (Contract_ID, Type, Start_date)

Skill (Skill_id, Skill_name)

Work_On (SSN, PNO, Hours)



Step 5: Mapping of relationship types **Binary / Unary 1:1**



Emp (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, Sup-SSN)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC, SSN)

Project (PNO, P Name)

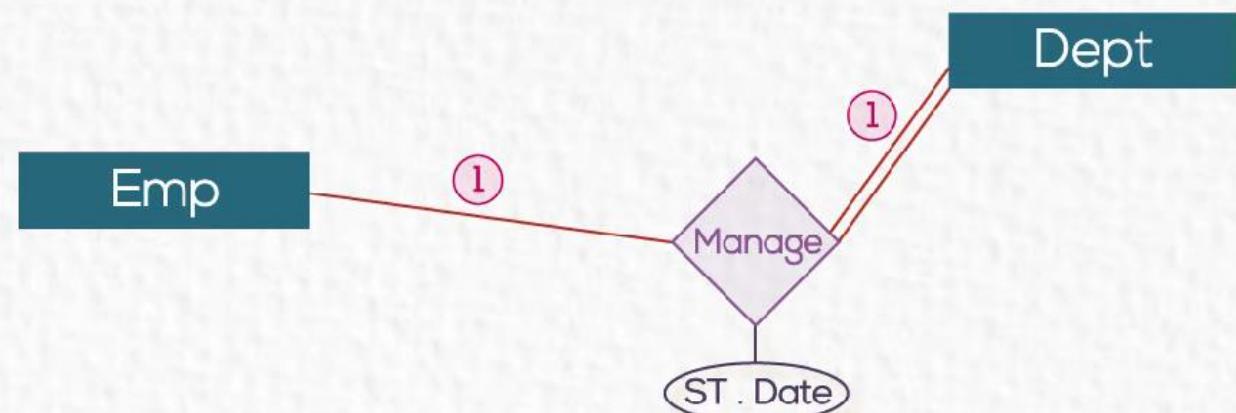
Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

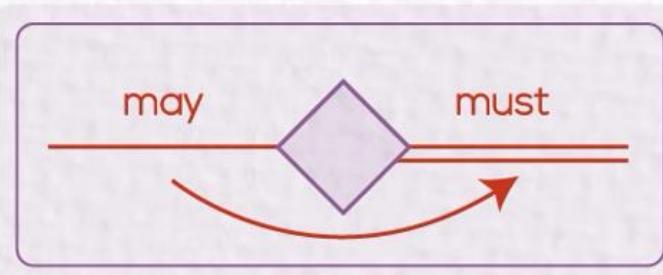
Contract (Contract_ID, Type, Start_date)

Skill (Skill_id, Skill_name)

Work_On (SSN, PNO, Hours)



Step 5: Mapping of relationship types **Binary / Unary 1:1**



Emp (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, Sup-SSN)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC, MGR _SSN ST. Date)

Project (PNO, P Name)

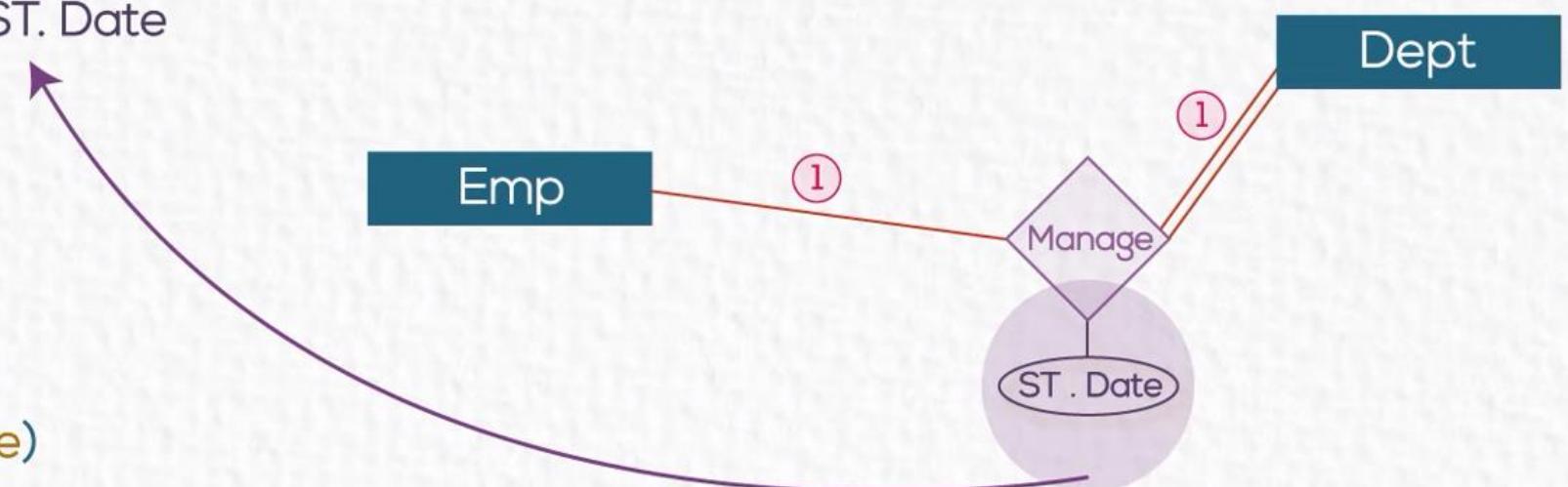
Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

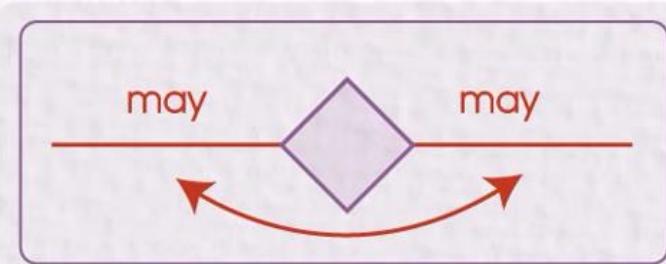
Contract (Contract_ID, Type, Start_date)

Skill (Skill_id, Skill_name)

Work_On (SSN, PNO, Hours)



Step 5: Mapping of relationship types **Binary / Unary 1:1**



Emp (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, Sup-SSN,

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC, MGR _SSN, ST. Date

Project (PNO, P Name)

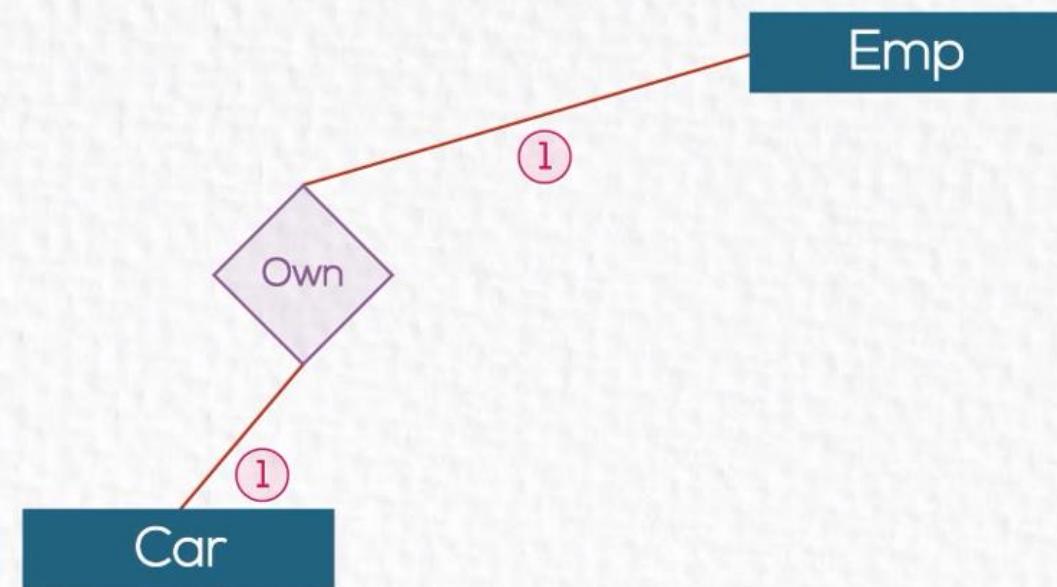
Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color

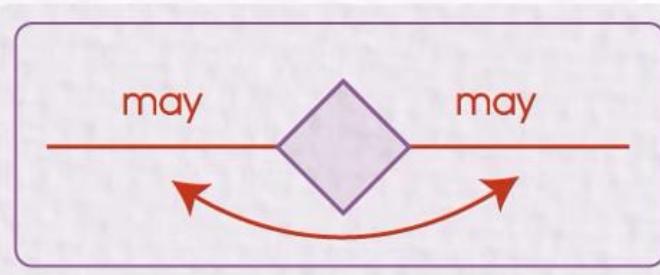
Contract (Contract_ID, Type, Start_date)

Skill (Skill_id, Skill_name

Work_On (SSN, PNO, Hours)



Step 5: Mapping of relationship types **Binary / Unary 1:1**



Emp (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, Sup-SSN, Plate_NO)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC, MGR _SSN, ST. Date)

Project (PNO, P Name)

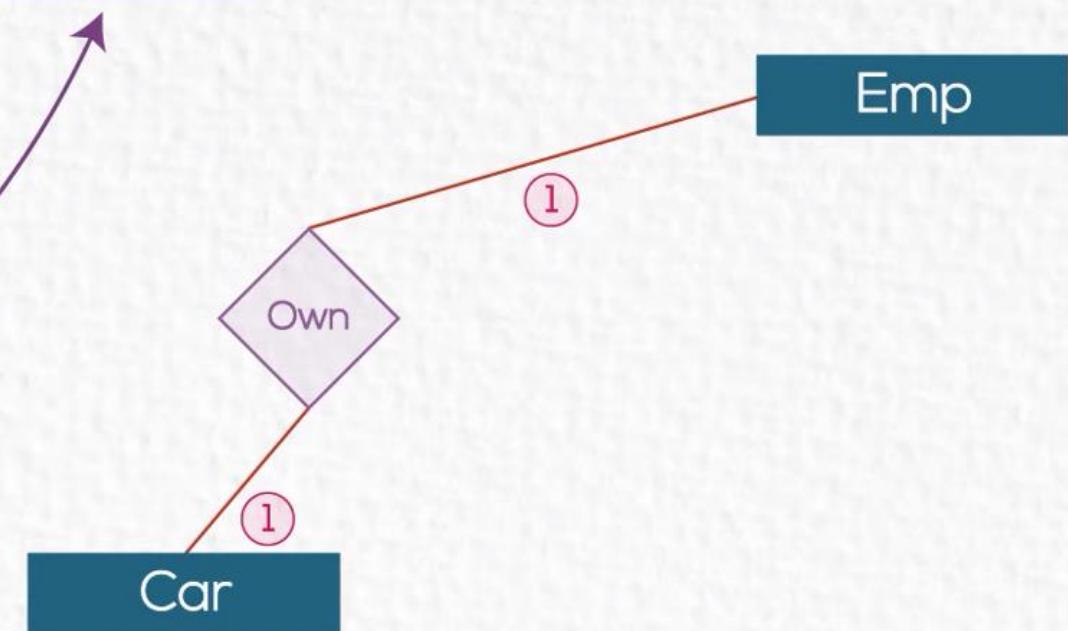
Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

Contract (Contract_ID, Type, Start_date)

Skill (Skill_id, Skill_name)

Work_On (SSN, PNO, Hours)



Step 5: Mapping of relationship types **Binary / Unary 1:1**

Emp (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, Sup-SSN, Plate_NO)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC, MGR_SSN, ST, Date)

Project (PNO, P Name)

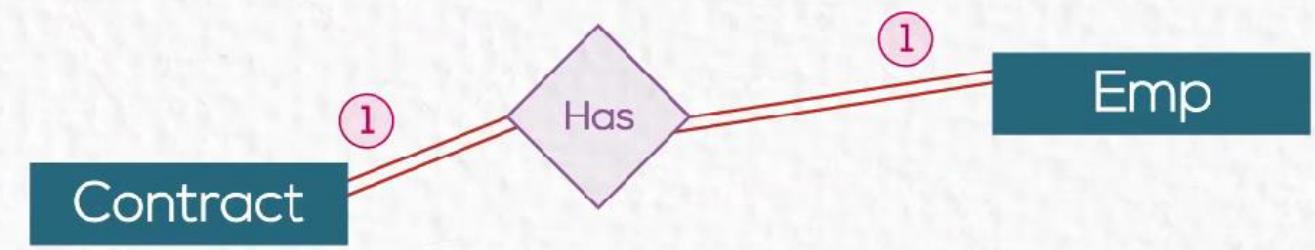
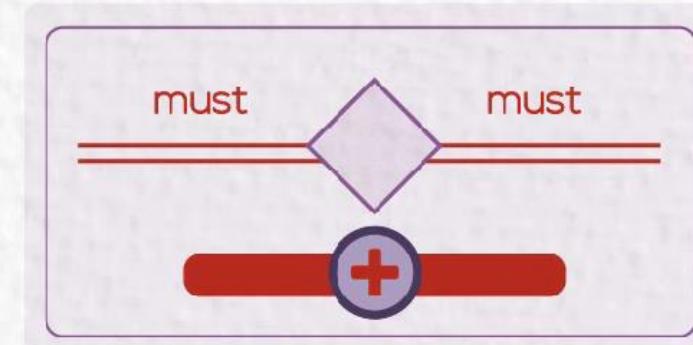
Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

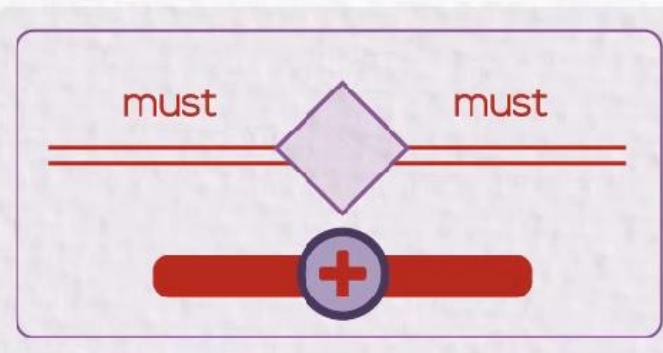
Contract (Contract_ID, Type, Start_date)

Skill (Skill_id, Skill_name)

Work_On (SSN, PNO, Hours)



Step 5: Mapping of relationship types **Binary / Unary 1:1**



Emp (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, Sup-SSN, Plate_NO)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC, MGR _SSN, ST, Date)

Project (PNO, P Name)

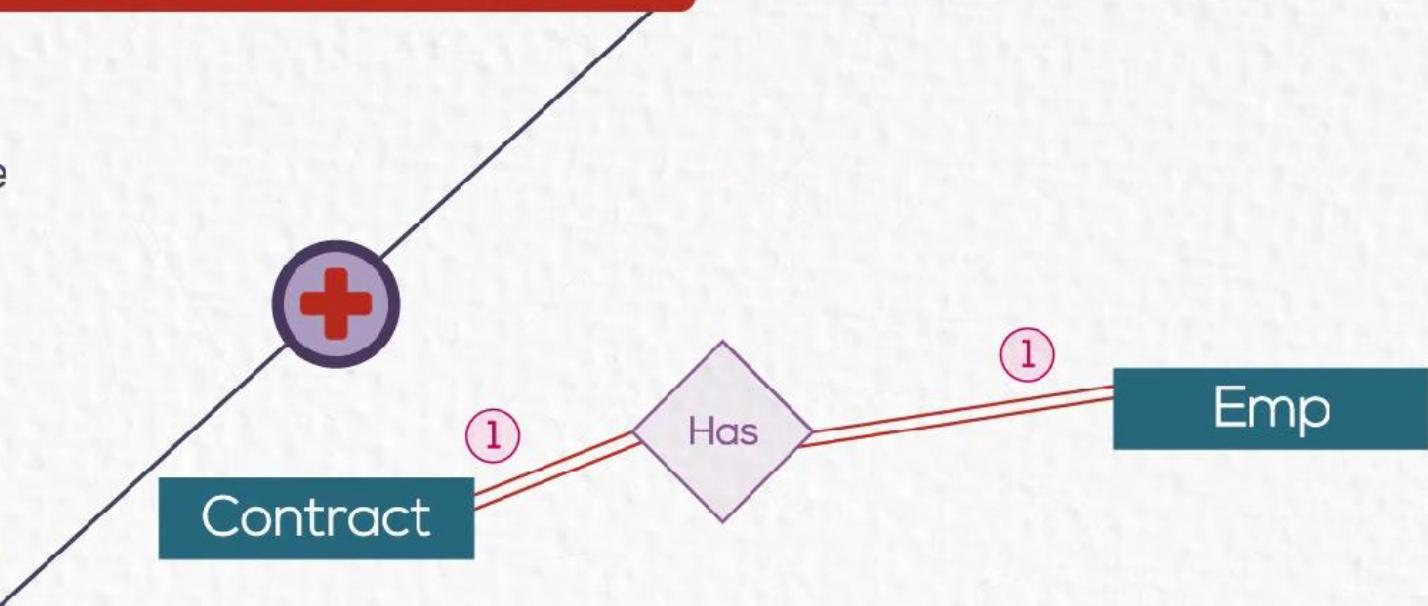
Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

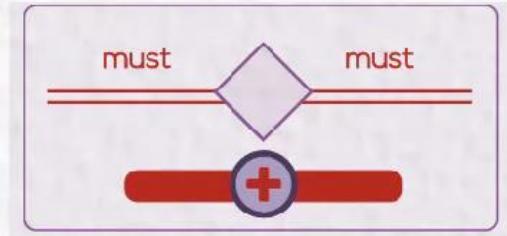
Contract (Contract_ID, Type, Start_date)

Skill (Skill_id, Skill_name)

Work_On (SSN, PNO, Hours)



Step 5: Mapping of relationship types **Binary / Unary 1:1**



Emp (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, Sup-SSN, **+ Contract_ID**, Type, Start_date)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC, MGR _SSN, ST, Date)

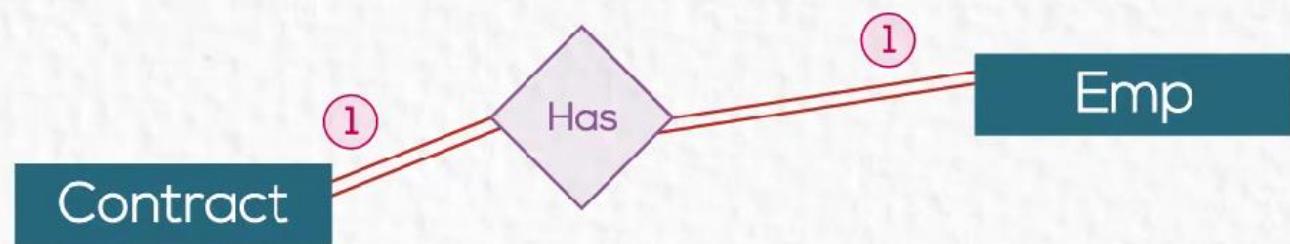
Project (PNO, P Name)

Dependent (SSN, Name, Relation)

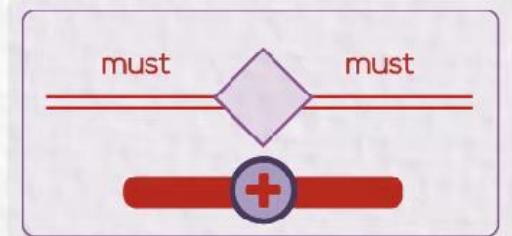
Car (Plate_NO, Model, Color)

Skill (Skill_id, Skill_name)

Work_On (SSN, PNO, Hours)



Step 5: Mapping of relationship types **Binary / Unary 1:1**



Emp- Contract (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, Sup-SSN, Plate_NO, Contract_ID, Type, Start_date)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC, MGR_SSN, ST, Date)

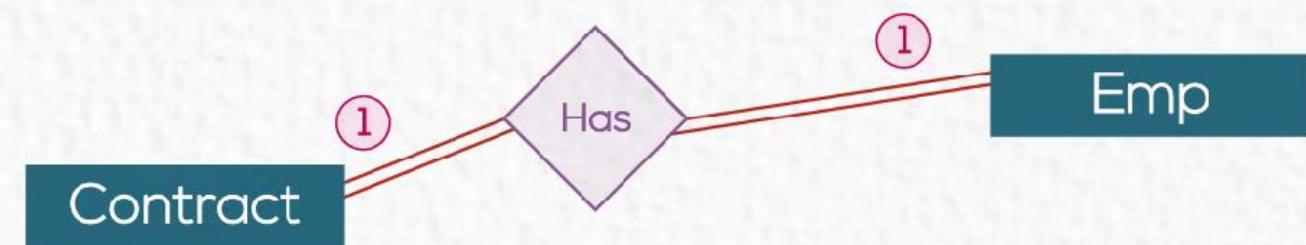
Project (PNO, P Name)

Dependent (SSN, Name, Relation)

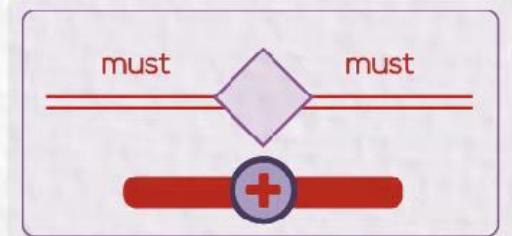
Car (Plate_NO, Model, Color)

Skill (Skill_id, Skill_name)

Work_On (SSN, PNO, Hours)



Step 5: Mapping of relationship types **Binary / Unary 1:1**



Emp- Contract (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, Sup-SSN, Plate_NO, Contract_ID, Type, Start_date)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC, MGR_SSN, ST, Date)

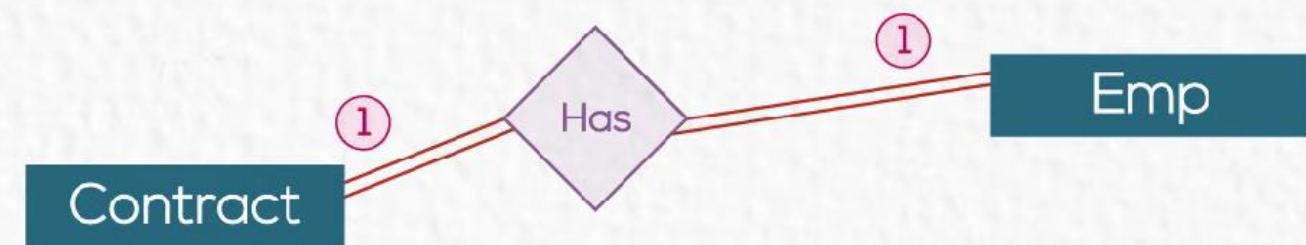
Project (PNO, P Name)

Dependent (SSN, Name, Relation)

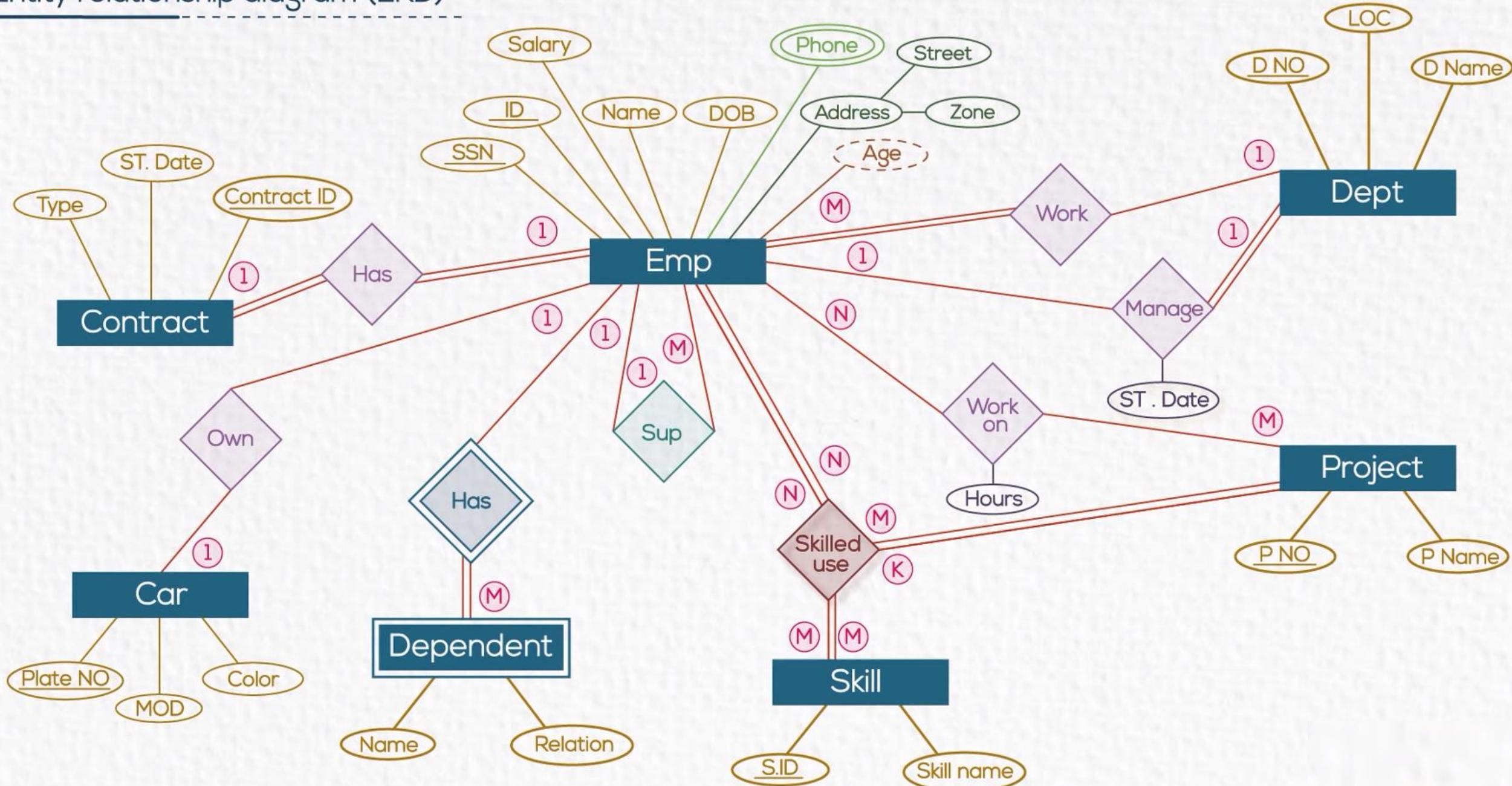
Car (Plate_NO, Model, Color)

Skill (Skill_id, Skill_name)

Work_On (SSN, PNO, Hours)



Entity relationship diagram (ERD)



Step 6: Mapping of ternary relationship types

Add FKs to the new table for all parent tables

Emp- Contract (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, Sup-SSN, Plate_NO, Contract_ID, Type, Start_date)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC, MGR _SSN, ST, Date)

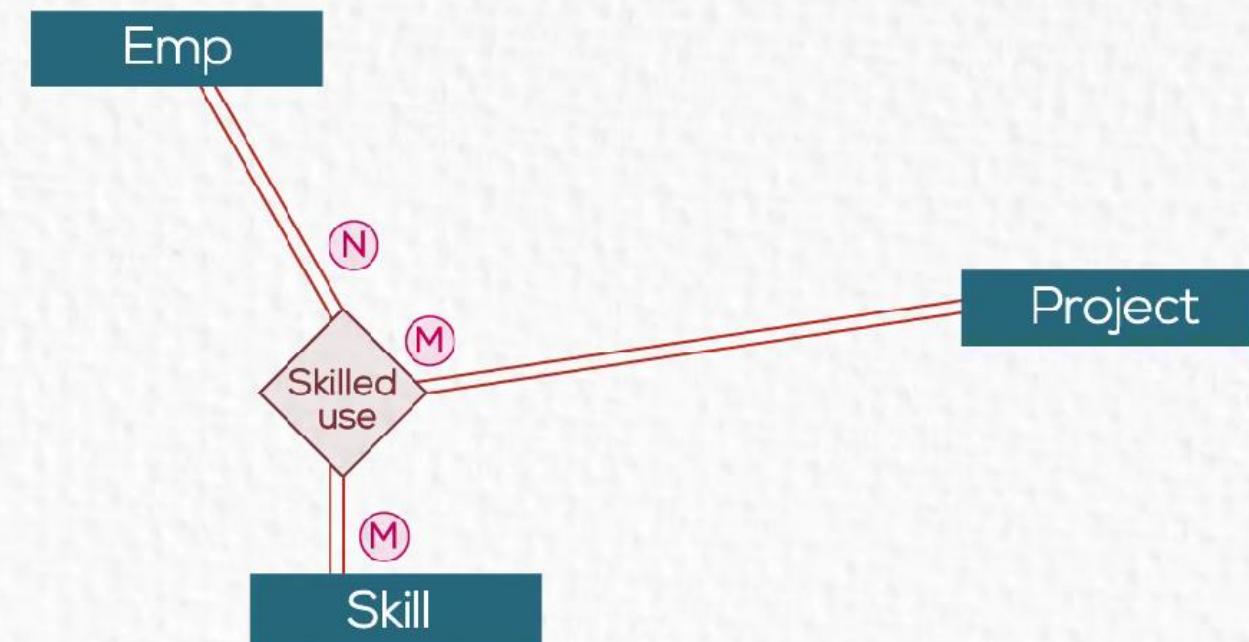
Project (PNO, P Name)

Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

Skill (Skill_id, Skill_name)

Work_On (SSN, PNO, Hours)



Step 6: Mapping of ternary relationship types

Add FKs to the new table for all parent tables

Emp- Contract (ID, SSN, Salary, Name, DOB, Street, Zone, DNO, Sup-SSN, Plate_NO, Contract_ID, Type, Start_date)

Emp - Phone (SSN, Phone)

Dept (DNO, D Name, LOC, MGR _SSN, ST. Date)

Project (PNO, P Name)

Dependent (SSN, Name, Relation)

Car (Plate_NO, Model, Color)

Skill (Skill_id, Skill_name)

Work_On (SSN, PNO, Hours)

Skills Used (SSN, PNO, Skill_id)

