

Question 5

Give the FDs for the constraints in the ER diagram.

5.1) The FDs are as follows

Album (album_no, song_id*, title, rel_date, format, track*)

Song (song_id, title, track*)

Musician(musician_id, album_no*, name, address)

Genre(genre_id,name)

An album has one or many songs

A musician has one or many songs

A musician has one or many albums

A song has only one type of genre

5.2) ER to relational mapping steps

1. Map Regular entity types

For each regular entity type E in the ER schema, create a relation R that includes all simple attributes of E

Choose one of the key attributes of E as the primary key for R

If the chosen key of E is composite, the set of simple attributes that form it will together for the primary key of R

Album (album_no, , title, rel_date, format)

Song (song_id, title,)

Musician (musician_id, name, address)

Genre (genre_id,name)

2. Map weak entity types

For each weak entity type W in the ER schema with owner entity of type E, create a relation R and include all simple attributes of W as attributes of R

Also include as foreign attribute of R the primary key attribute of the relation that correspond to the owner entity type

The primary key of R is the combination of the primary keys of the owner and the partial key of the weak entity type W if any

Album (album_no, song_id*, title, rel_date, format, track*)

Song (song_id, title, track*)

Musician(musician_id, album_no*, name, address)

Genre(genre_id,name)

3. Map binary 1:1 relation types

For each binary 1:1 relationship type R in the ER schema, identify the relations S and T that correspond to the entity types participating in R

Choose one of the relations-say S-and include a foreign key in S the primary key of T.

Musician(musician_id, album_no*, name, address)

4. Map binary 1:N relationship types

For each regular binary 1:N relationship type R, identify the relation S that represent the participating entity type at the N-side of the relationship type.

Include as foreign key in S the primary key or the relation T that represents the other entity type participating in R

Incude any simple attributes of the 1:N relation type as attributes of S

Album (album_no, song_id*, title, rel_date, format, track*)

Song (song_id, title, track*)

5. Map Binary M:N relationship types

For each regular binary M:N relationship type R, create a new relation S to represent R.

Inlcude as foreign key attributes in S the primary keys of the relations that represent the participating entity types. Their combination will form the primary key of S.

Also include any simple attributes of the M:N relationship type as of S

6. Map multivalued attributes

For each multivalued attribute A, create a new relation R. this relation R will include an attribute corresponding to A plus the primary key attribute K as a foreign key in R of the relation that represents the entity type of relationship type that has A as an attribute

The primary key of R is the combination of A and K. If the multivalued attribute is composite, we include its simple components.

7. Map N-ary relationship types

For each n-ary relationship type R where $N > 2$ create a new relationship S to represent R

Include as foreign key attributes in S the primary keys of the relations that represent the participating entity types.

Also include any simple attributes of the n-ary relationship as attributes of S

Album (album_no, song_id*, title, rel_date, format, track*)

Song (song_id, title, track*)

Musician (musician_id, album_no*, name, address)

Genre (genre_id,name)