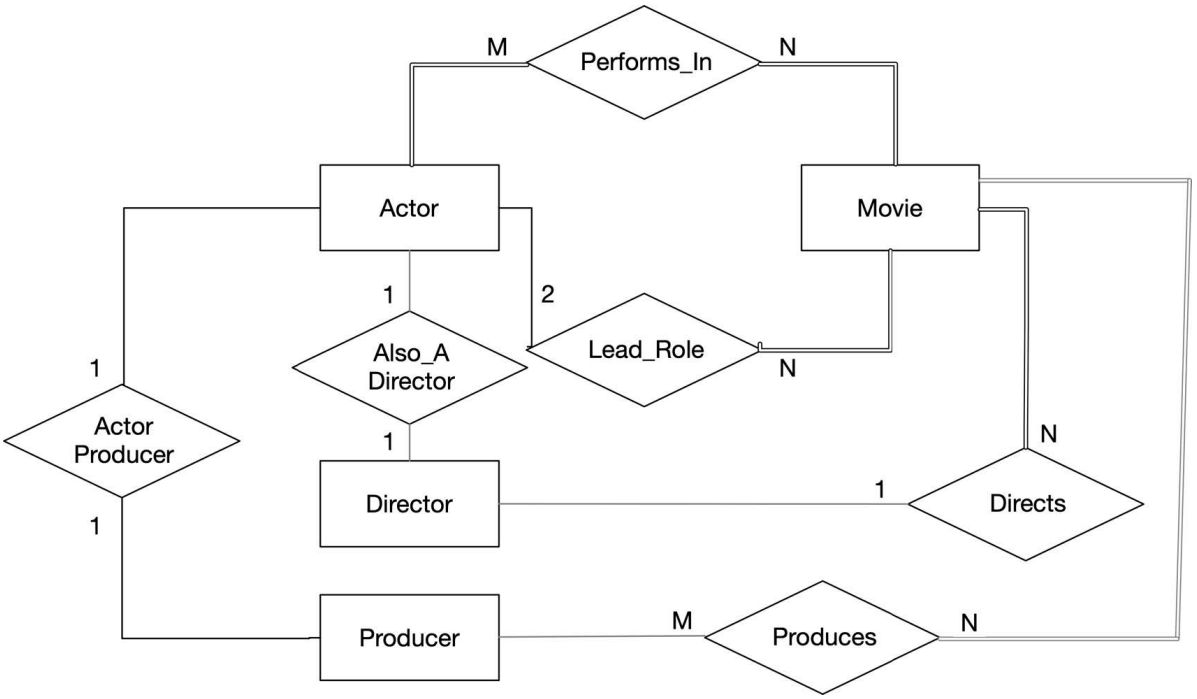
Question 1: Using the step-by-step mapping process, create a relational schema from the ER diagram below. Your schema should identify all primary keys and foreign keys. Use the standard format for logical relational schemas as covered in class. An example of the standard format is on the next page. **Hand-written submissions will not be accepted.**



Solution
Assumptions:

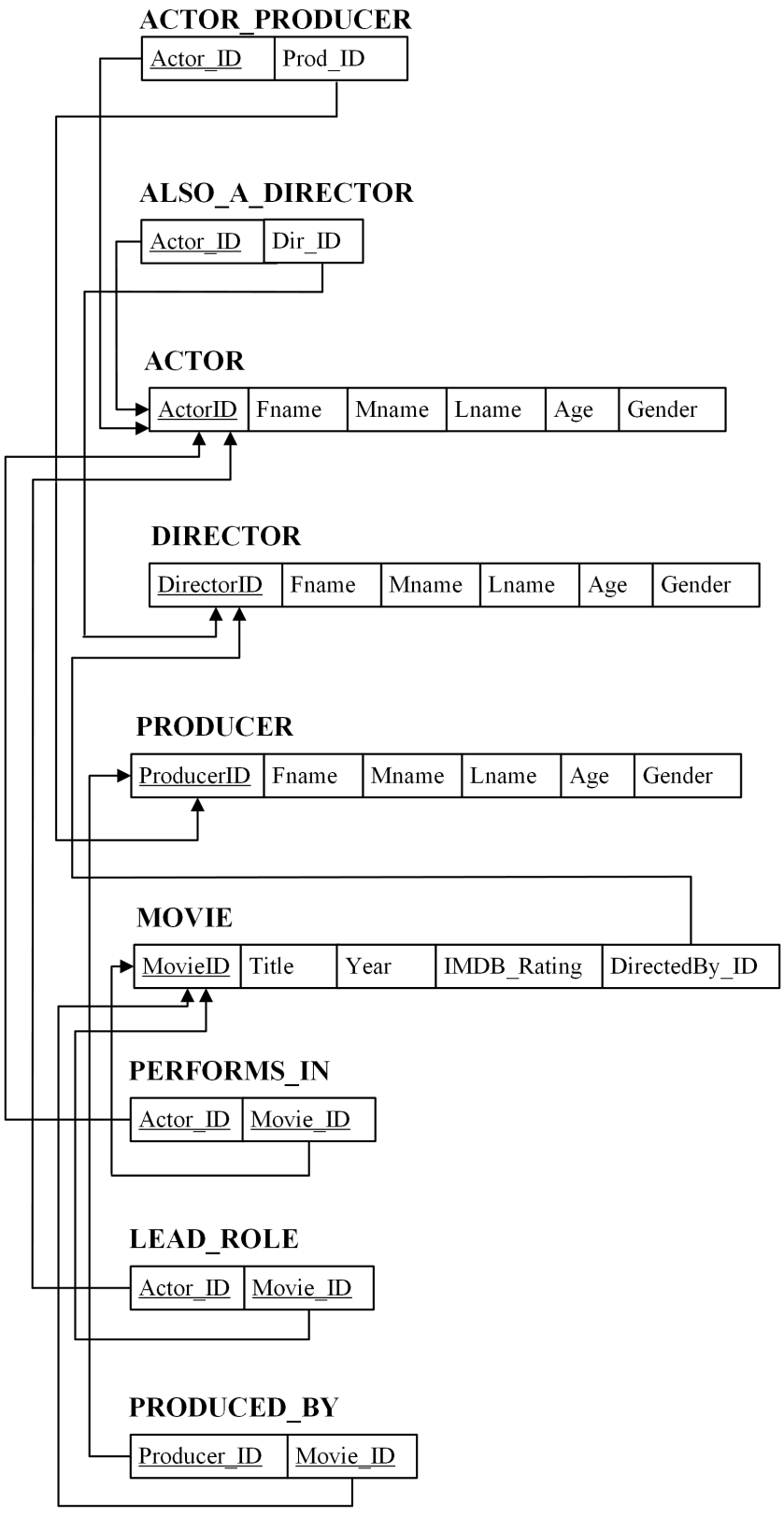
1. We represent each entity with its unique id (primary key).

2. Actor entity type is represented as a relation ACTOR with attributes ActorID (primary key), FirstName, MiddleName, LastName, Age and Gender. A similar schema represents Director and Producer entities with corresponding primary keys, DirectorID and ProducerID respectively.

3. Each movie has a unique ID, MovieID, which is the PK of the relation, MOVIES, because different movies may have the same Title. Other attributes include Year (year of release) and IMDB_rating. It has a foreign key, Directed_By to represent its N:1 relationship (many movies can be director by a director but each movie has only one director) with DIRECTOR.

4. Other Corresponding foreign keys in each relation is represented in Relation_ID format.

5. We've not utilized the procedure to transform EER diagrams (step 8) because of the given nature of the ER diagram. However, it is to be noted that ACTOR, PRODUCER, and DIRECTOR can be generalised as a PERSON which has the following attributes - SSN (primary key), FirstName, MiddleName, LastName, Age, Gender, and is specialised based on the attribute Role_Played.


ACTOR_PRODUCER
Actor_ID
Prod_ID
ALSO_A_DIRECTOR
Actor_ID
Dir_ID
ACTOR
ActorID
Fname
Mname
Lname
Age
Gender
DIRECTOR
DirectorID
Fname
Mname
Lname
Age
Gender
PRODUCER
ProducerID
Fname
Mname
Lname
Age
Gender
MOVIE
MovieID
Title
Year
IMDB_Rating
DirectedBy_ID
PERFORMS_IN
Actor_ID
Movie_ID
LEAD_ROLE
Actor_ID
Movie_ID
PRODUCED_BY
Producer_ID
Movie_ID