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Project 5 – Design Write Up
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For this design exercise, the entities I created were "Movie", "Director", "Actor", "Movie Writer", and "Production Company", and "Extra". "Extra" was the additional entity I decided to include in the diagram per the Project 5 instructions. The relationships between these entities are "Produces", "Acts In", "Wrote", "Directs", "Is Extra In", and "Has Sequel", the last of which is a recursive relationship between Movie and it.

Beginning with Production Company, the relationship between Production Company and Movie is many to many because there are cases in which more than one Production Company produces the same movie. This relationship does not require total participation because there are instances of movies that are not produced by any given Production Company (e.g., independent films), and there are Production Companies that have not produced any movies (either because they have yet to do so or because they are a shell company that will never do so). Additionally, every Production Company can produce more than one Movie. The key for Production Company is its Name, because company names are trademarked, there cannot be more than one Production Company with any given name. Production Company also has a Corporate Address attribute.

The Movie entity is the only entity to share a relationship with each other entity. Movie has the attributes "Title" (which is a key), "Rating", "Release Year", and "Genre", which is a multi-valued attribute. Title is the key because Movie titles are trademarked and therefore must be unique. Movie also has the recursive relationship Has Sequel, which is a one to many relationship, because one movie can have more than one sequel, however there cannot be a sequel without a prequel.

The Actor entity shares the Acts In relationship with Movie which is many to many because many actors act in any given movie and any given actor can act in one or more movies. There is total participation in this relationship because there cannot be a movie without an actors and one cannot be an actor without acting in any movies. Actor has the attributes Actor Name, Residence, Age, DOB, and Actor ID. Actor ID is the key, which will be created in the database to be unique to any given actor. An Actor ID is needed because a given Actor may also be a Director, a writer, or an Extra, for another movie. It is also needed because Actor names are not unique, nor are birthdays, ages, or residences (yes, in theory there could be two different actors with the same name, same DOB, living at the same residence, it's a small chance, but there is still a chance).

The Movie Writer entity shares the relationship Wrote with Movie. This relationship is many to many because more than one writer can work on any given

movie and a writer may write many movies. This relationship requires total participation in either direction because every movie must have a writer and one cannot be a movie writer without having written a movie. The attributes of Movie Writer are Writer ID (which is the key) and Writer Name. Writer ID is the key for the same reasons mentioned in the description of the Actor entity.

The Director entity shares the Directs relationship with Movie. This relationship is many to many because more than one Director can direct any given movie and a Director can direct many movies. This relationship also requires total participation on both ends because every movie has a Director, and one cannot be a Director with out actually directing a movie. The Director entity has Director ID as it's key, a unique identifier within the database for the same reason as Actor ID. Director also has Director Name as an attribute.

Our final entity, Extra, is one that I created. It shares the relationship Is Extra In with movie which is many to many because a movie can have many extras and an extra can be an extra in many movies. Extra has partial participation from movie to Extra because not every movie has extras but has total participation from Extra to Movie because one can not be an Extra without having been an extra in a movie. Extra has attributes Extra ID and Extra Name, of which Extra ID is the key for the same reasons as Actor, Director, and Movie Writer.