For #1–3, indicate what specifically in the diagram supports your answer e.g. "genre has a double circle, for multivalued" and not just "genre is multivalued".

Cardinality establishes the max (upper bound). Participation establishes the min (lower bound). For questions like #2e ("Every movie has a producing studio."), "required" means looking at the lower bound — does every movie have to have a producing studio? For #2f ("A movie is produced by two different studios."), "allowed" means looking at the upper bound — can a movie have more than one producing studio, or is it limited to one?

For #2h, the question is asking about an actor playing multiple characters *in the same movie*, not just whether an actor can play multiple characters.

For #2m, `theater` and `datetime` are together only a partial key because `SCREENING` is a weak entity, so there can be multiple screenings with the same theater, date, and time as long as something in the rest of the key is different.

Cardinality in ternary relationships is about how many instances of a entity type can participate in relationships with a *pair* of the other entity types e.g. the 1 on `ACTOR` in `NOMINATED_FOR` means that there can only be one actor paired with a particular movie and award, making #2o ("Two different actors in a movie are nominated for the same award.") forbidden.

A number of the statements in #3 get at the independence of separate elements in the diagram. For example, #3d ("Some producers have also been directors.") is about specific entities in `PRODUCER` and `DIRECTOR` — these are separate entity types and there's nothing that precludes the same person being listed in both. The link through `ACTOR` is irrelevant.

A PlantUML note — when writing the links between entity types and relationship types, writing them as they are read can lead to better layouts. For example, for `STUDIO`, `PRODUCES`, and `MOVIE`:

```
STUDIO -1- PRODUCES
PRODUCES =N= MOVIE
```

Reversing the order of either line (e.g. `PRODUCES -1- STUDIO`) is still valid, but may lead to a less-nice layout.

For #4–5, be sure to list constraints not captured in the diagram. These commonly relate to domains (e.g. regions are Northeast, Midwest, Southeast, Southest, West and parties are Republican, Democrat, Independent, Other), date ranges (start date $\leq$ end date) and other date orderings (e.g. the date ranges for different Congresses should not overlap, a bill's introduction date should be within the date range of the Congress it was introduced in), and consistencies between relationships (e.g. those sponsoring and voting on a bill should be serving in the Congress the bill was introduced in).

For #4–5, also be sure to list assumptions made. For example, if you introduced an

ID as a primary key for Representatives, be sure to state the underlying assumption that names are not unique as neither that nor an ID are mentioned in the description given in the problem.

You can mix the two notations for denoting cardinality — 1:N and (min,max) — in one diagram but not within a single relationship. This is because of how the labels apply — for a relationship involving entity types A and B, a 1 on B's line specifies how A participates with B (an instance of A can be paired with at most one instance of B), while (1,3) on B's line specifies how B participates with A (B must be paired with at least one and at most three different instances of A).

Be careful when specifying lower bounds on participation, either through total participation or (min,max) where min ≥ 1 — this requires that there be instance(s) of the relationship for any occurrence of the entity. Keep timing in mind! For example, papers are assigned between two and four reviewers – but when are those reviewers assigned? If `PAPER` is assigned a (2,4) cardinality in the `REVIEWED_BY` relationship, it is not valid to have a paper recorded in the database without at least two reviewers assigned — this doesn't allow a paper to be entered into the system when it is submitted to the conference and then reviewers assigned in a later step.