CS 775/875 **Database Management Systems**

Spring 2021

Jeffrey Fernandes **Assignment #10**

Due: Monday, April 26, 11:59 PM.

Submit Instructions: Submit hw10.pdf on MyCourses
Write your answers in order by question number.

Objective: Practice analyzing requirements for database systems and developing conceptual models expressed as Entity-Relationship (ER) schemas

Submission: 1 day late: 2 points off; 2 days late: 4 points off.

Question 1) (15)

The following ER diagram has been created for a database that will store information about motion pictures. The diagram illustrates entities and relationships (with constraints). Attributes are omitted so that we can solely focus on the relationships between the entities.

Using this ER diagram for reference, respond to the following statements:

* Suppose an actor can play a lead role in at most 2 movies, and there are 2 actors:

a) what is the minimum number of movies? 2

b) what is the maximum number of movies? 4

* Suppose there are 2 movies:

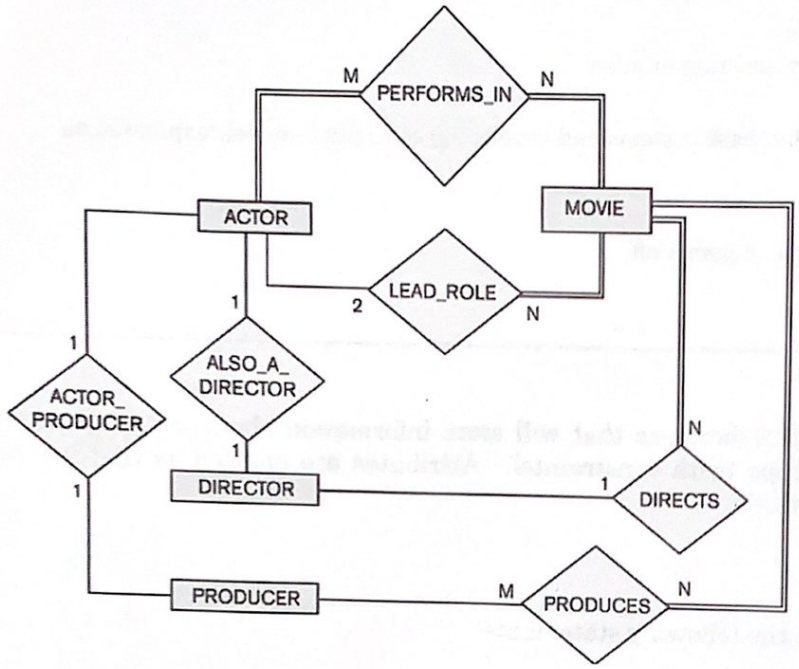
c) what is the minimum number of actors that can play lead roles? 1

d) what is the maximum number of actors that can play lead roles? 2

*Suppose there are 2 movies:

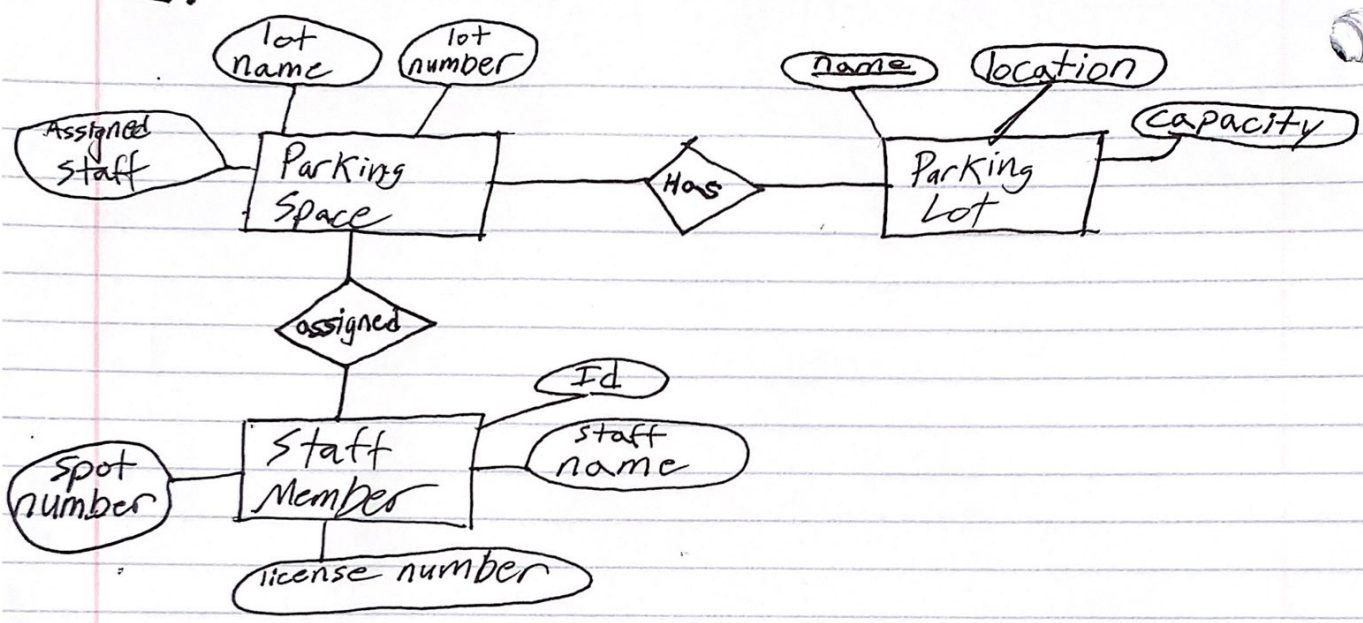
e) what is the minimum number of directors? 1

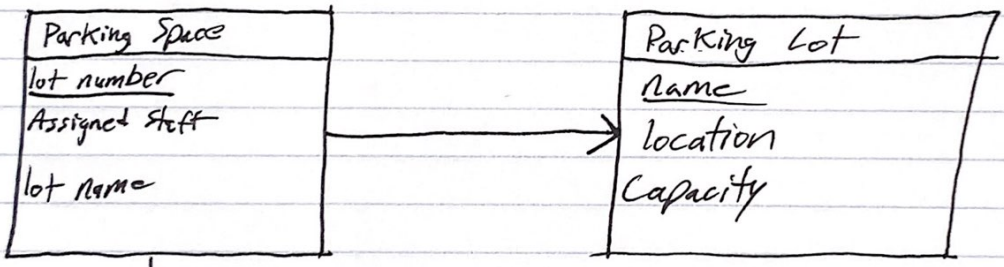
Using this ER diagram for reference, respond to the following statements with TRUE, FALSE, or MAY
Assign a response of MAYBE to statements that, while not explicitly shown to be TRUE, cannot be pr
FALSE based on the diagram.

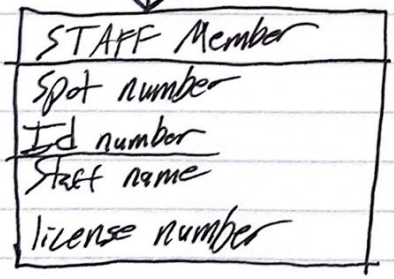


STATEMENT	TRUE	FALSE	MAYBE
f) There are actors that have no movies.		✓	
g) Every movie has exactly one director.	✓		
h) An actor may be the lead in at most two movies.	✓		
i)If there are no movies, then there are no directors.	✓		
j) If there are no actors, then there are no movies.		✓	
k) A movie can have at most two lead actors	✓		
l) An actor who is also a director can direct at most one movie.	✓		
m) A movie may have no producers.			✓
n) There are producers with no movies.		✓	
o) A producer may act in several movies.			✓

2.



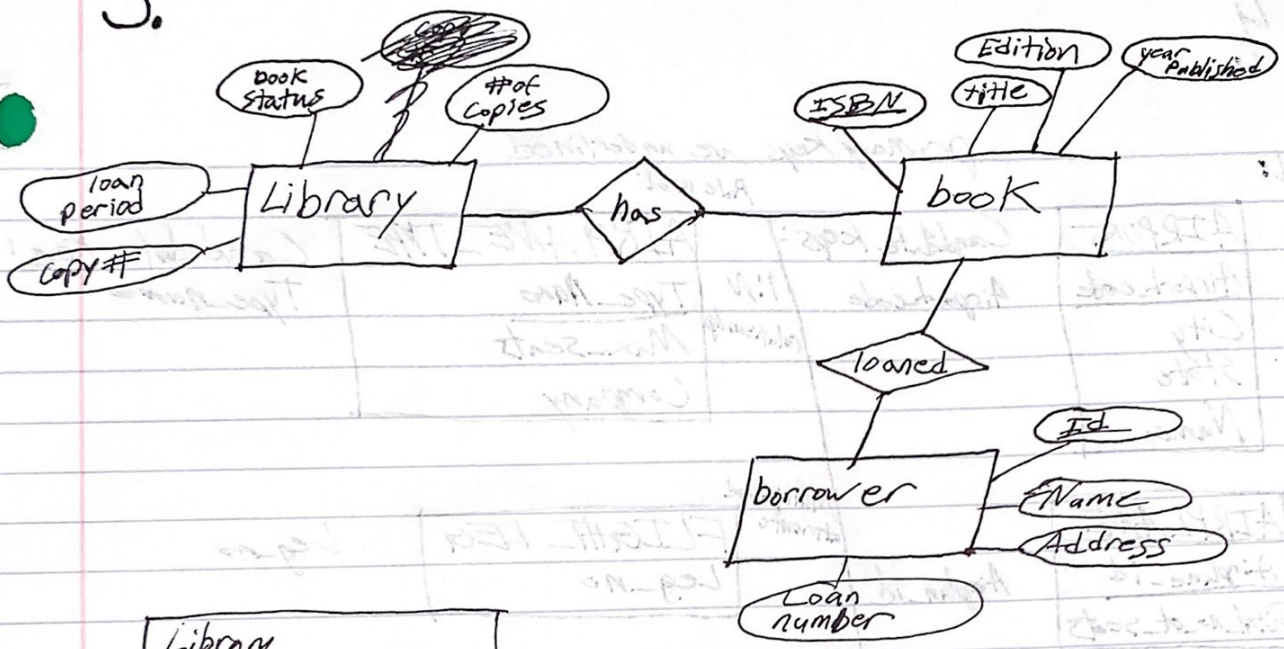


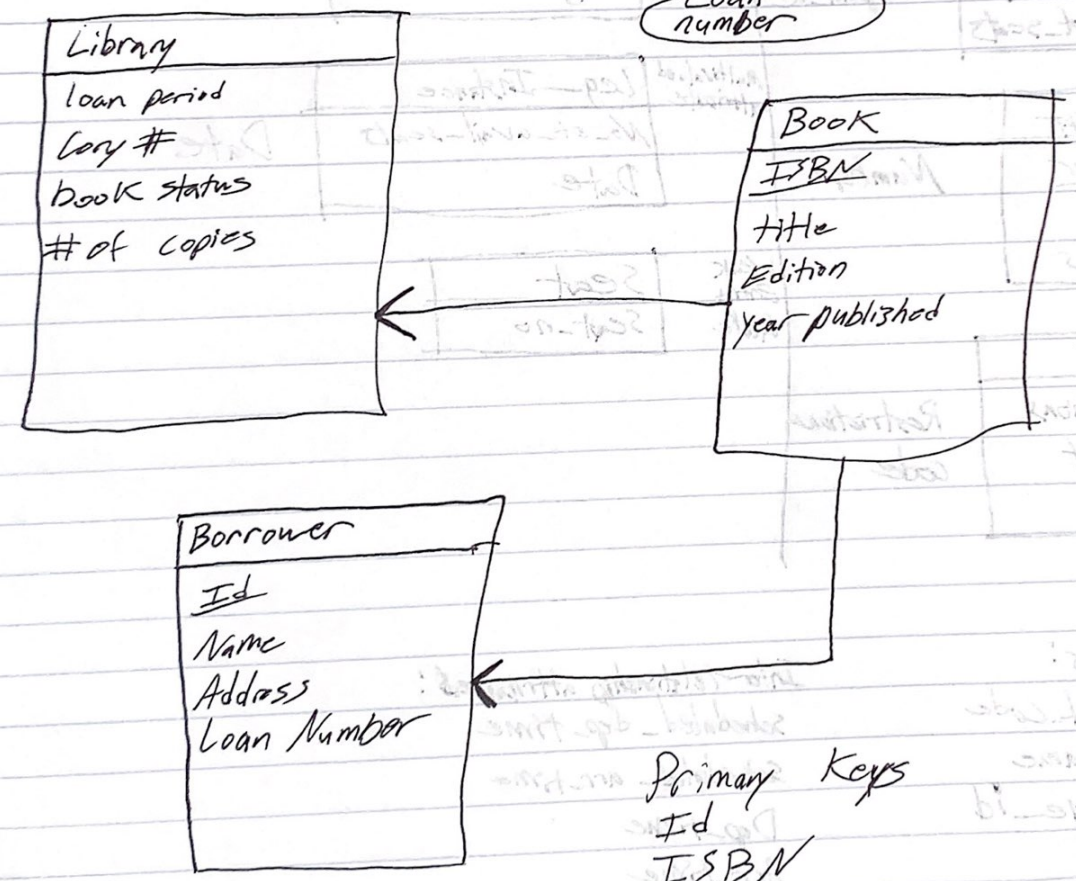


Primary Key:
lot number
name
Id number

Candidate Key:
spot number
Assigned Staff

3.





Primary Keys
Id
ISBN
book status

Candidate Keys:
loan period
loan number
title

4.

primary keys are underlined

Rule used: Strong Entity Rule

AIRPORT
- Airport_code
- City
- State
- Name

Candidate keys: Airport_code

Rule used: 1:N relationship

AIRPLANE_TYPE
- Type_Name
- Max_seats
- Company

Candidate keys: Type_name

Rule used: 1:1 relationship

AIRPLANE
- Airplane_id
- Total_no_of_seats

Aipplan_id

Rule used: Multivalued attribute

FLIGHT_LEG
- Leg_no

Leg_no

Rule used: Multivalued attribute

Leg_Instance
- No_of_avail_seats
- Date

Date

Rule used: 1:1 relationship

FLIGHT
- Number
- Airline
- Weekdays

Number

Rule used: Weak Entity Rule

Seat
- Seat_no

Rule used: Weak Entity Rule

FARE
- Restrictions
- Amount
- Code

Restrictions code

All keys:
- Airport_code
- Type_name
- Airplane_id
- Name

Foreign keys:
- Seat_no
- Leg_no
- Code

Inter-relationship attributes:
- scheduled_dep_time
- scheduled_arr_time
- Dep_time
- Arr_time
- Customer_name
- Cphone