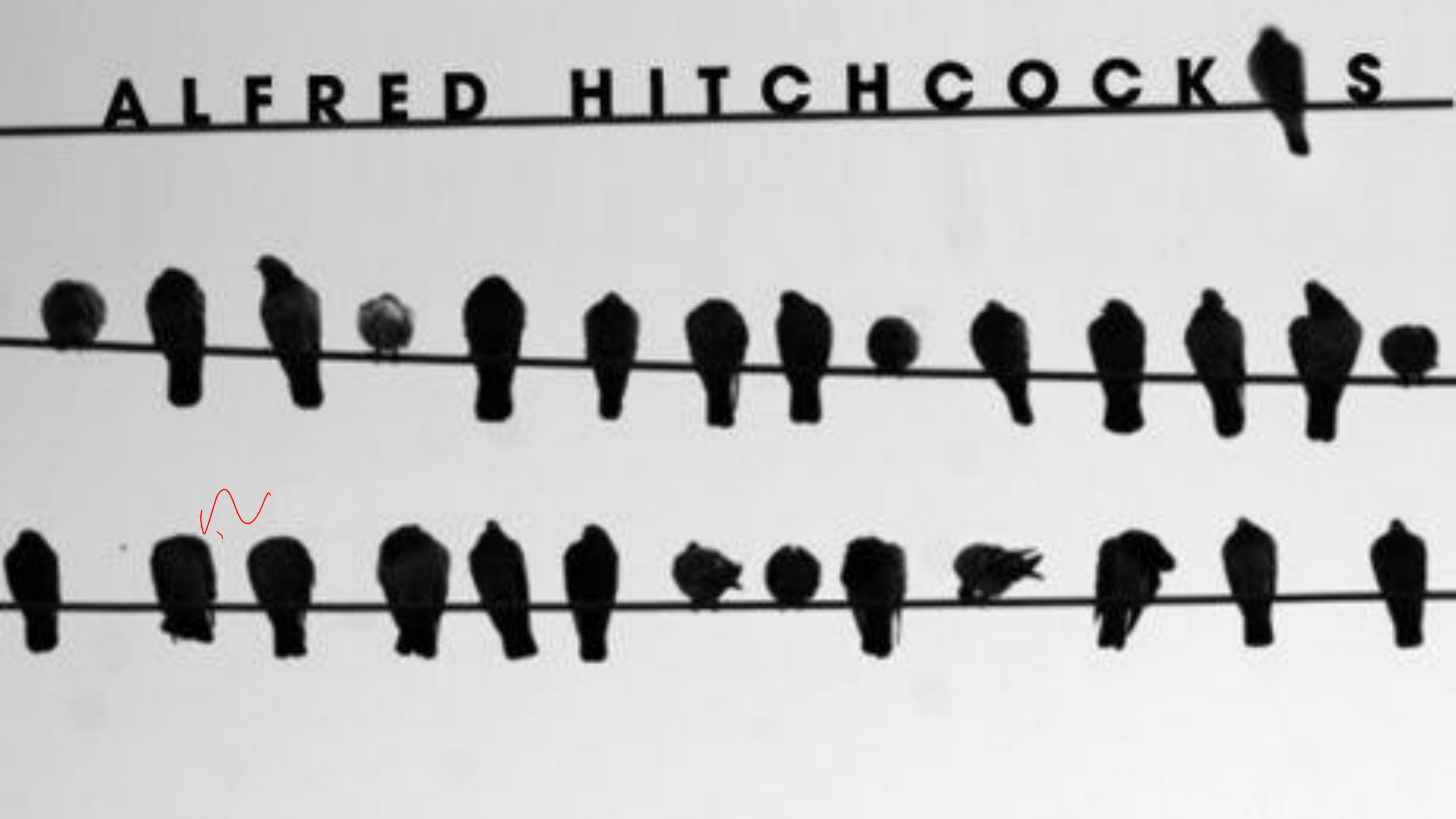
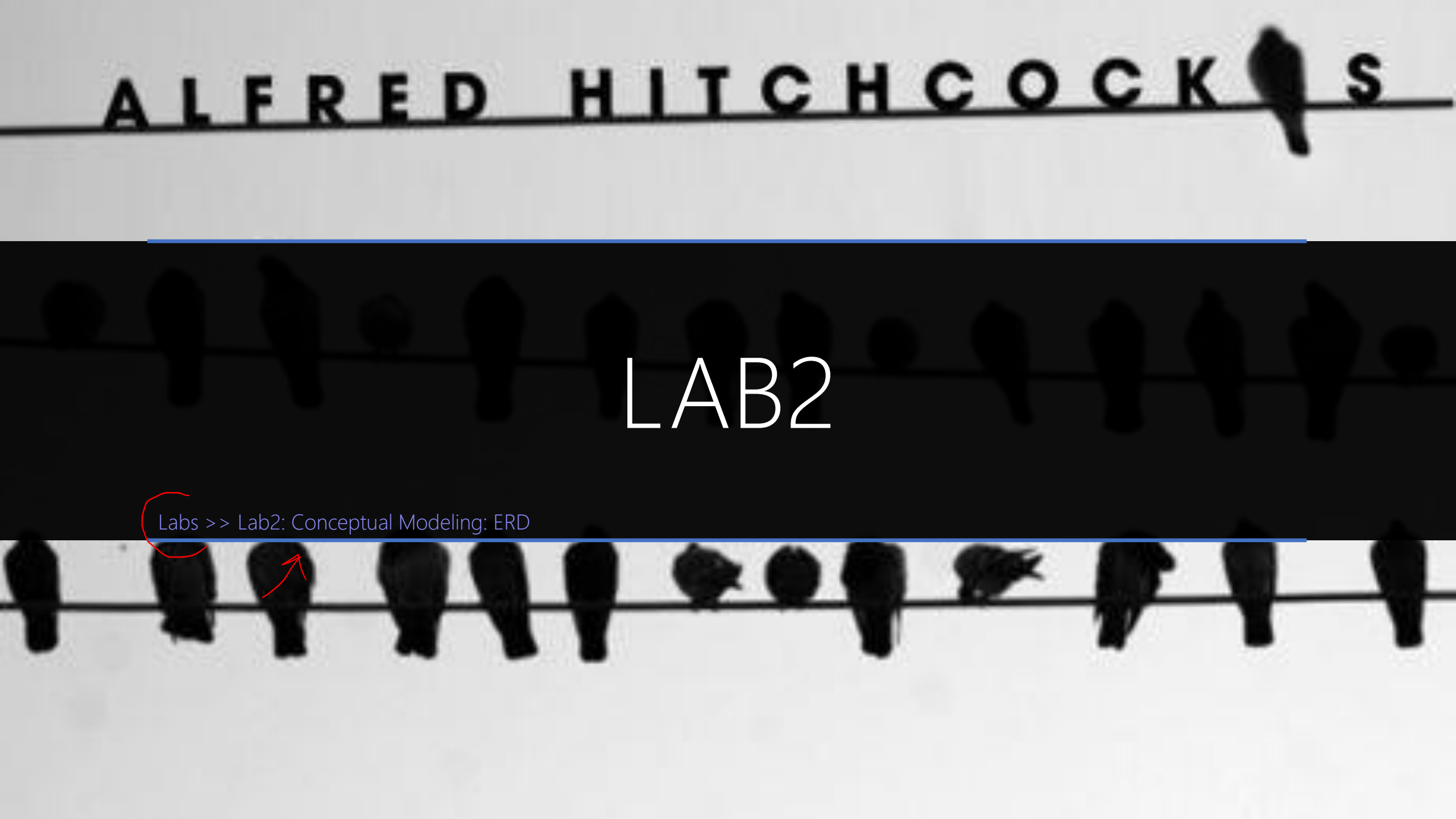
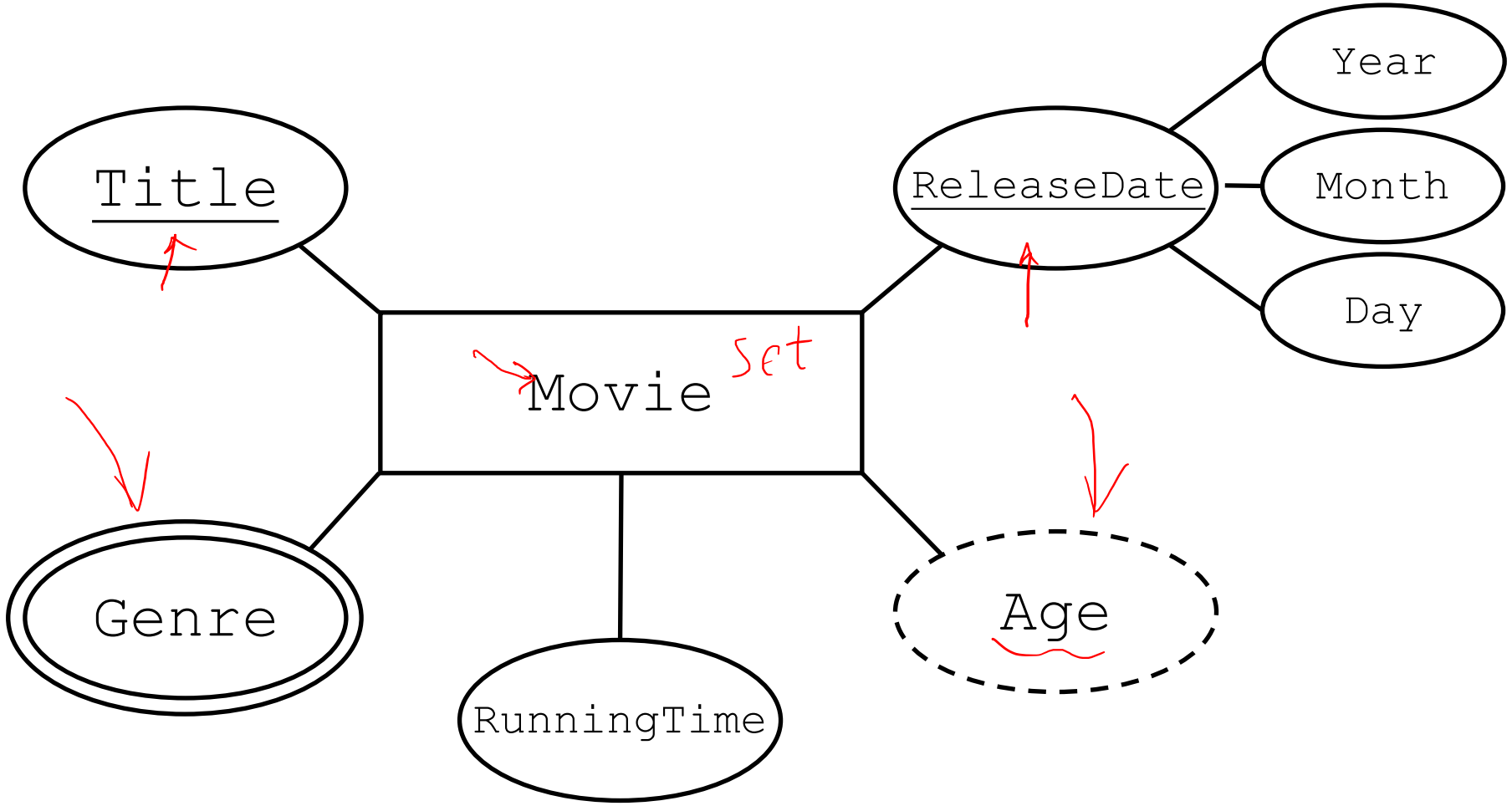

ALFRED HITCHCOCKS



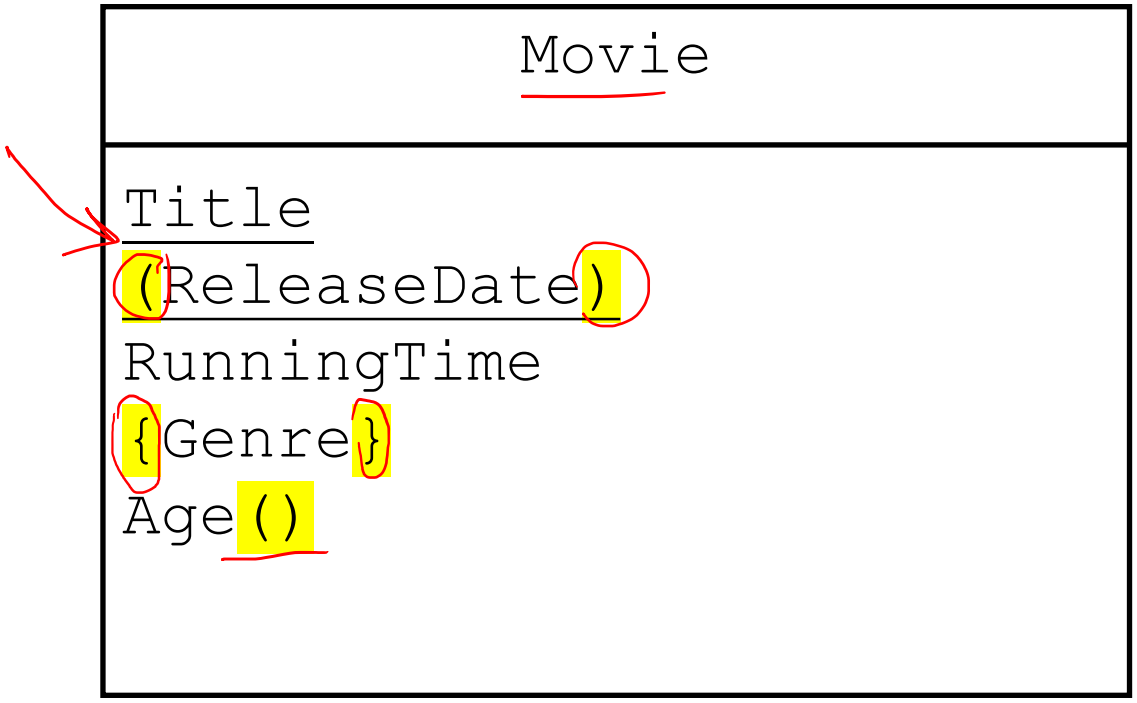
LAB2

Labs >> Lab2: Conceptual Modeling: ERD

E/R × Movie Schema



E/R × Attribute



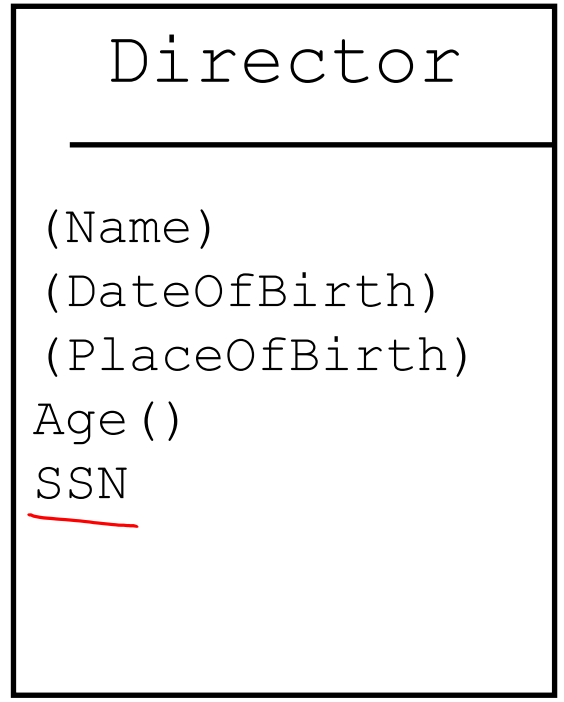
E/R × Attribute × Multiple Keys

Standard E/R model does not have!

K_1={Name, DateOfBirth}

K_2={SSN}

Choose?

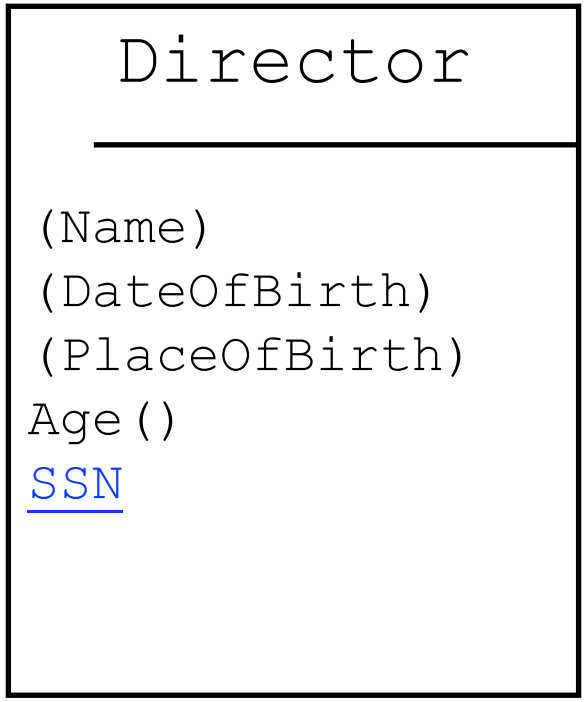


E/R × Attribute × Multiple Keys

Standard E/R model does not have!

K_1={Name, DateOfBirth}
K_2={SSN}

Choose?
Simplicity counts!
K_2 is called Primary Key (PK)

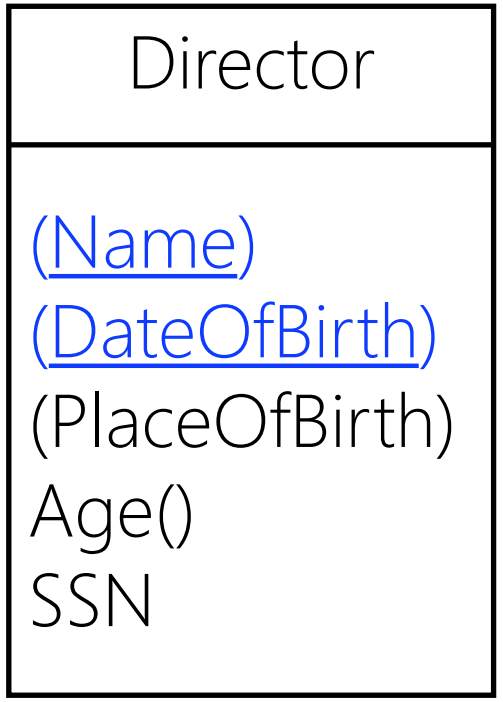


E/R × Attribute × Multiple Keys

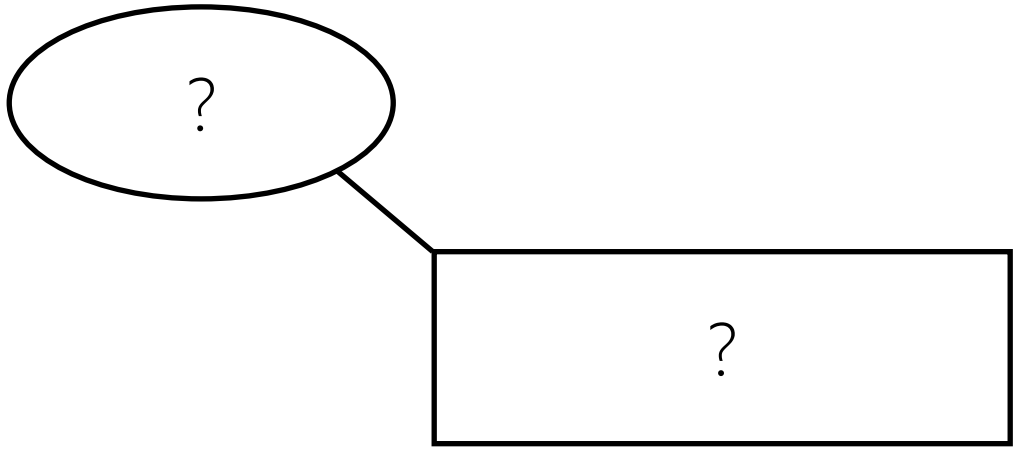
Standard E/R model does not have!

K_1={Name, DateOfBirth}
K_2={SSN}

Choose?
Real world matters as well!
SSN is not available for all Directors!
K_1 is called Primary Key (PK)



E/R × Your System (5mins)



E/R × Relationship (r)

An association among entities

Movie (E_1)

e_1.Title=`The Birds'

e_1.ReleaseDate=March 28, 1963

e_1.RunningTime=119

e_1.Genre={`Drama', `Horror', `Mystery '}

e_1.Age=51

Director (E_2)

e_2.Name=`Alfred Hitchcock'

e_2.DateOfBirth=August 13, 1899

e_2.PlaceOfBirth=England

e_2.SSN=NULL

$r = (e_1, e_2)$ = ({`The Birds', `March 28, 1963'}, {`Alfred Hitchcock', `August 13, 1899'})

E/R × Relationship (r)

An association among entities

Movie (E_1)

e'_1.Title=`Rosemary's Baby'

e'_1.ReleaseDate=June 12, 1968

e'_1.RunningTime=136

e'_1.Genre={`Drama', `Horror'}

e'_1.Age=51

Director (E_2)

e'_2.Name=`Roman Polanski'

e'_2.DateOfBirth=August 18, 1933

e'_2.PlaceOfBirth=France

e'_2.SSN=NULL

$r' = (e'_1, e'_2)$ = ({`Rosemary's Baby', `June 12, 1968'}, {`Roman Polanski', `August 18, 1933'})

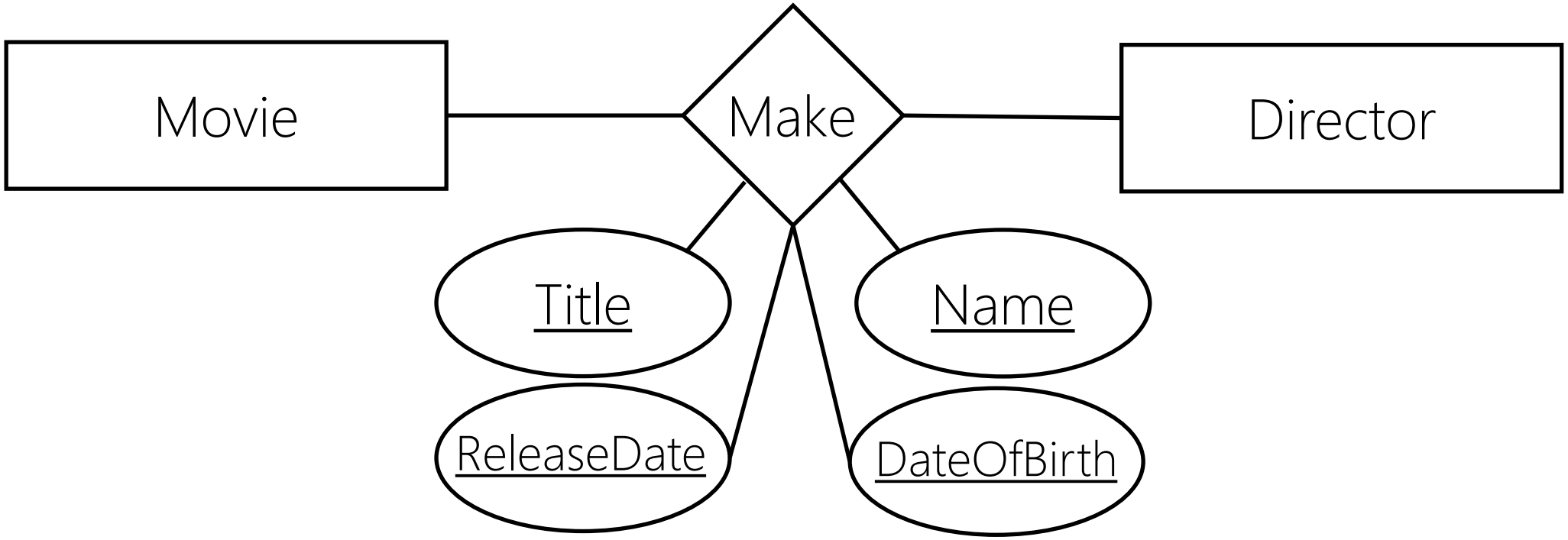
E/R × Relationship Set (R)

$r = (e_1, e_2) = (\{`The\ Birds', `March\ 28,\ 1963'\}, \{`Alfred\ Hitchcock', `August\ 13,\ 1899'\})$
$r' = (e'_1, e'_2) = (\{`Rosemary's\ Baby', `June\ 12,\ 1968'\}, \{`Roman\ Polanski', `August\ 18,\ 1933'\})$

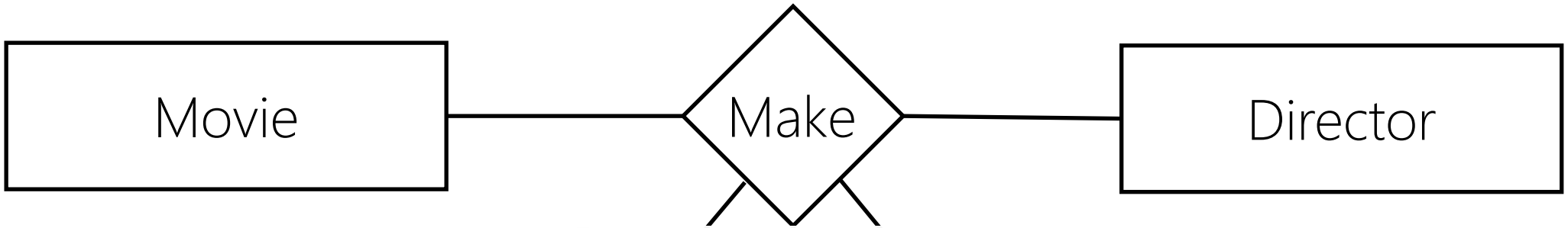
$R = \{r, r', \ldots\}$

Binary Relationships

E/R × Relationship Set (R)

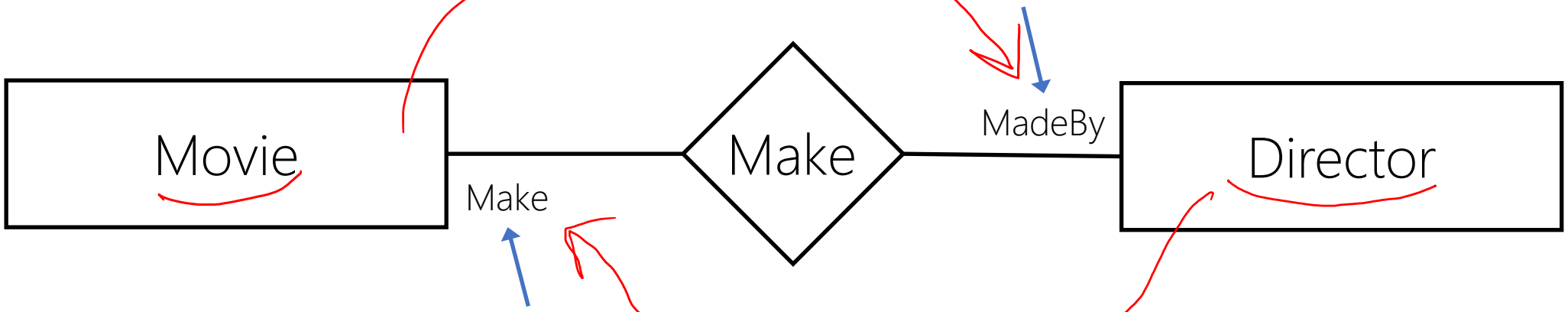


E/R × Relationship Set (R)



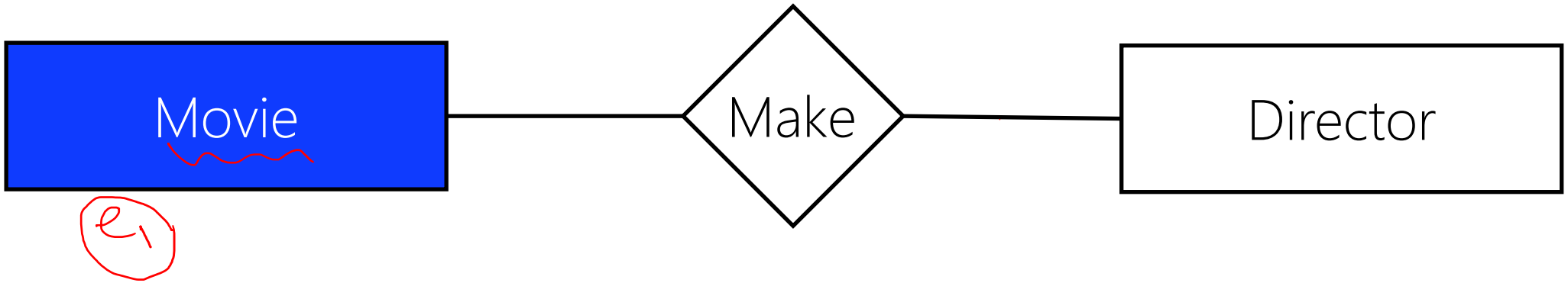
WE DO NOT SHOW THE KEYS FROM PARTICIPATING ENTITY SETS!

E/R × Relationship Set × Role



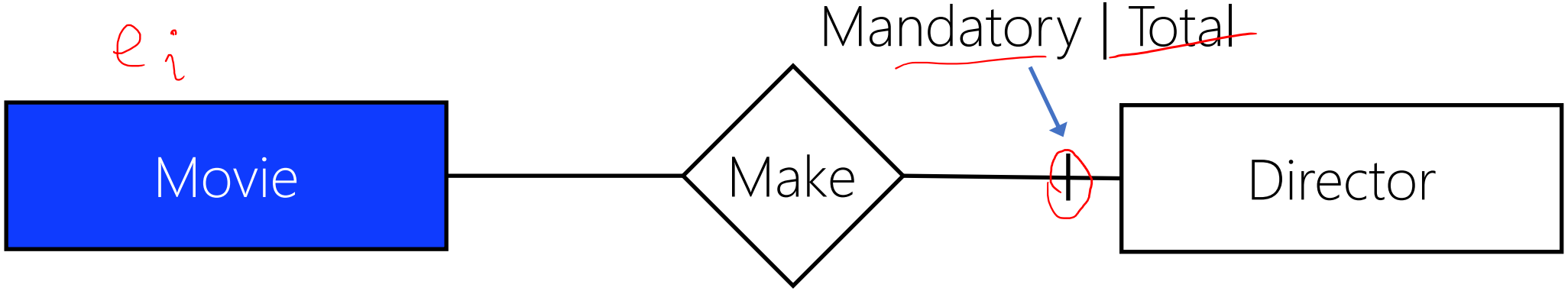
When not clear, the role in relationship SHOULD be mentioned

E/R × Relationship Set × Participation



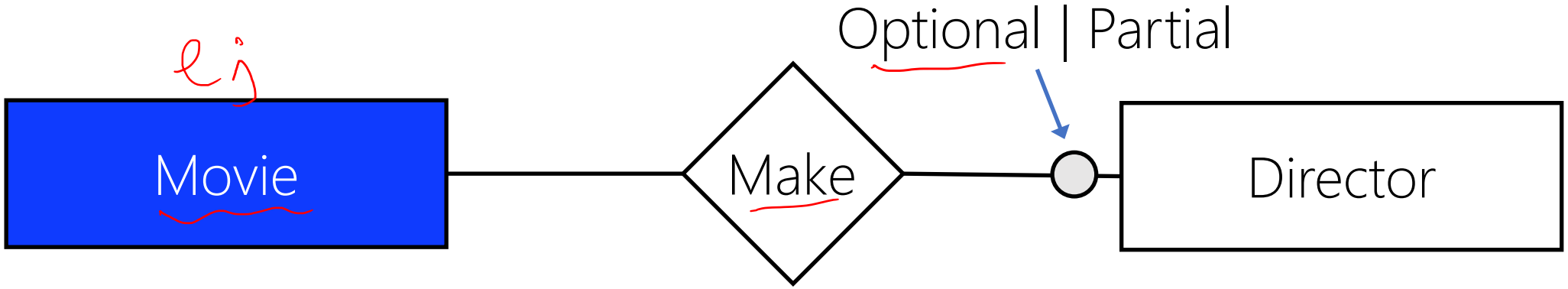
A Movie MUST participate in Make relationship?
A Movie MUST have Director?
Is there a Movie in the system without Director?

E/R × Relationship Set × Participation



A Movie MUST participate in Make relationship? Yes.
A Movie MUST have Director? Yes.
Is there a Movie in the system without Director? No!

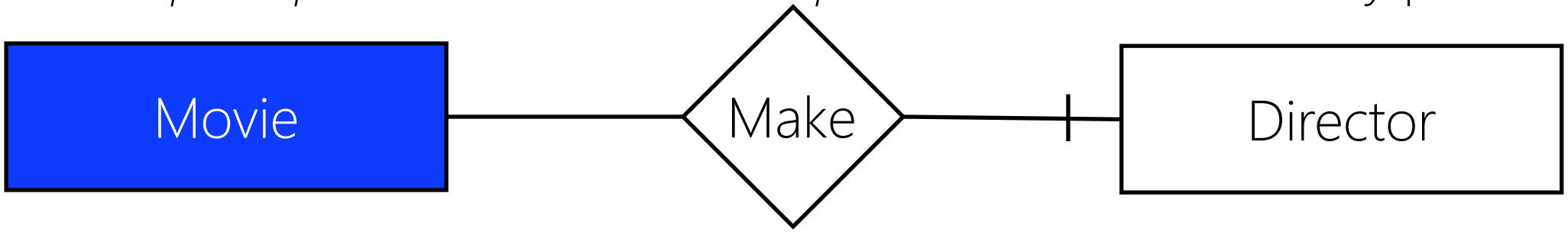
E/R × Relationship Set × Participation

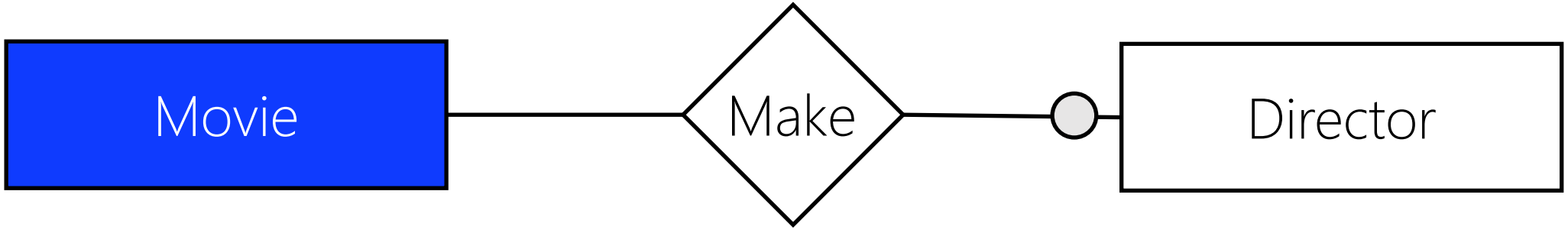


A Movie MUST participate in Make relationship? No!
A Movie MUST have Director? No!
Is there a Movie in the system without Director? Yes.

E/R × Relationship Set × Participation

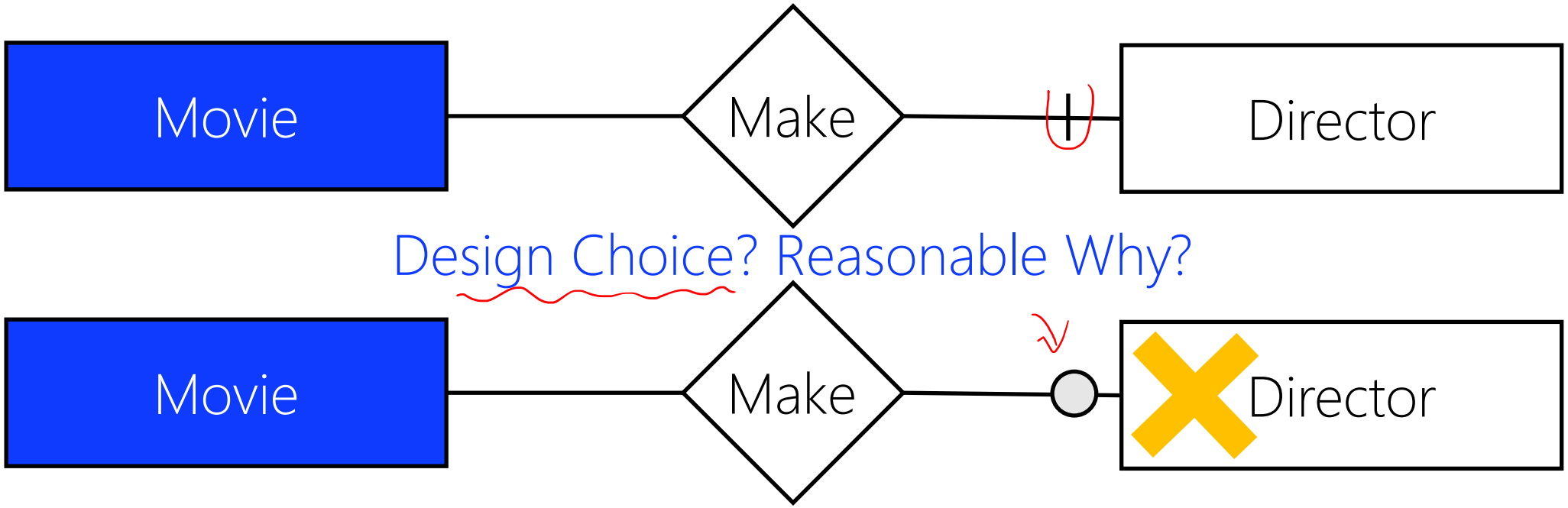
Movie's participation in Make relationship with Director is mandatory | total.



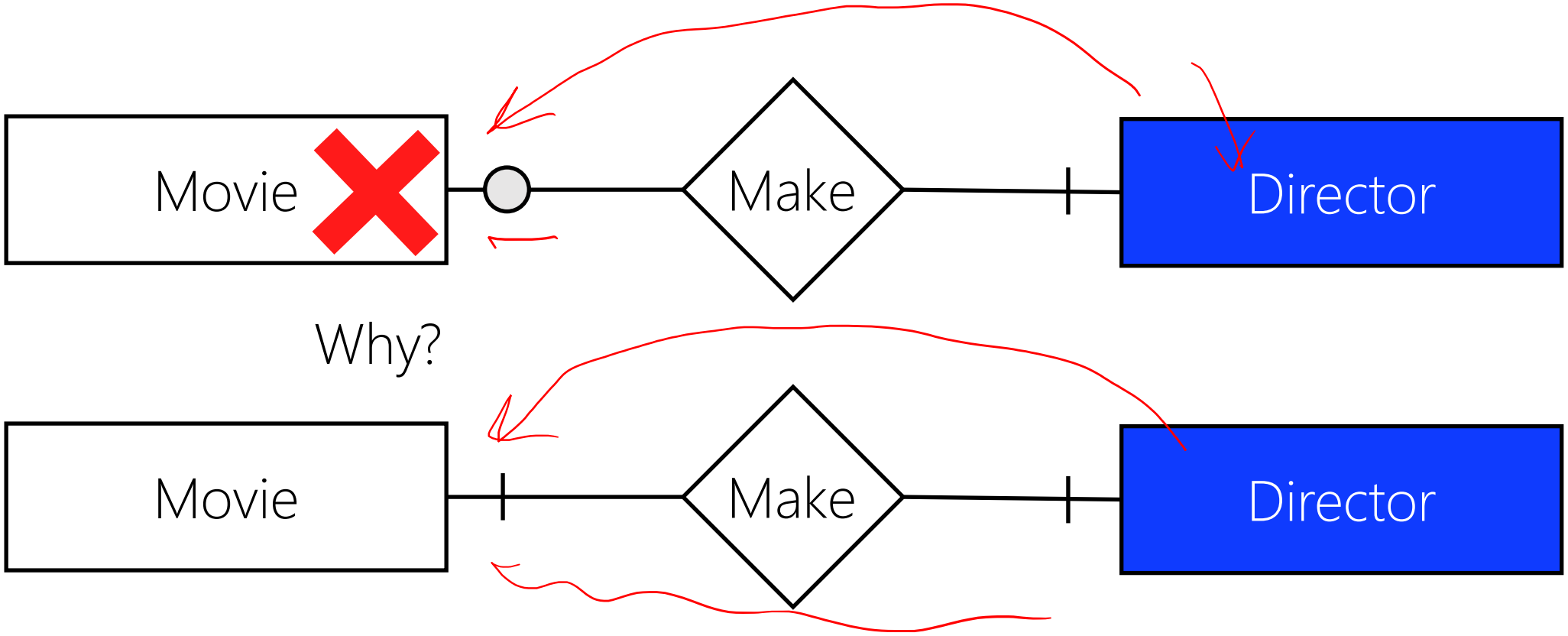


Movie's participation in Make relationship with Director is optional | partial.

E/R × Relationship Set × Participation



E/R × Relationship Set × Participation



E/R × Relationship Set × Participation

Participation is the minimum number of times an entity in one entity set can be associated with an entity in the related entity set.

Either 0 or 1

Participation also called Ordinality

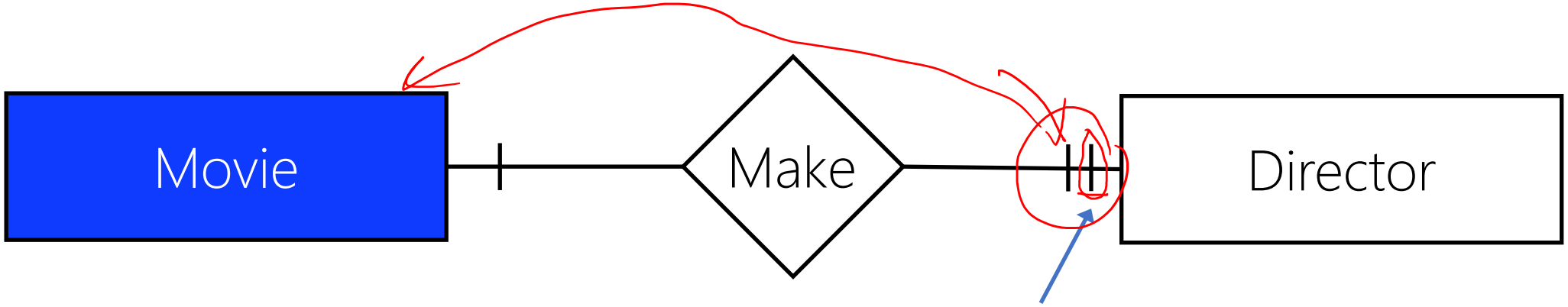
E/R × Relationship Set × Multiplicity

Multiplicity is the maximum number of times an entity in one entity set can be associated with an entity in the related entity set.

Either 1 or Many

Multiplicity also called Cardinality

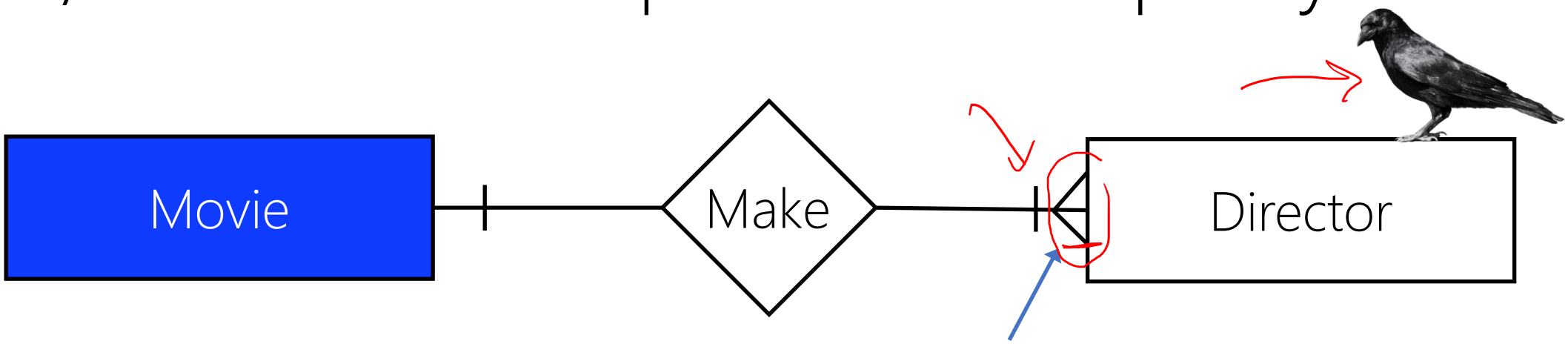
E/R × Relationship Set × Multiplicity



A Movie participate in Make relationship with 1 Director at max

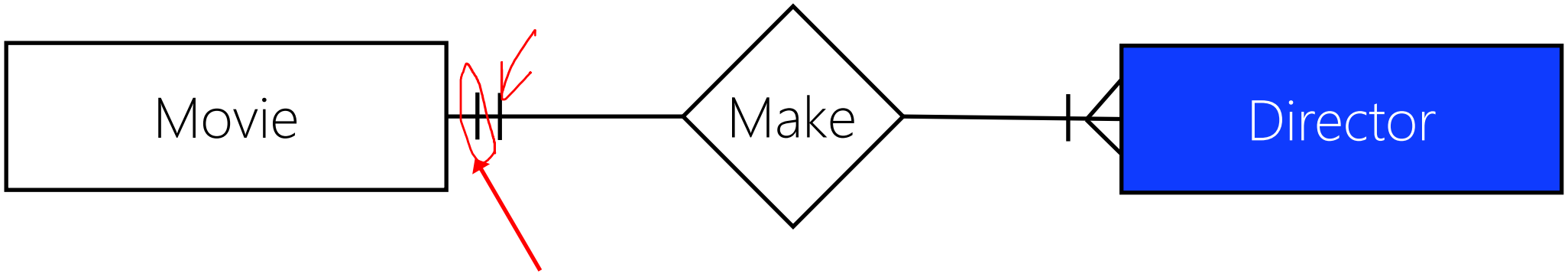
Barton Fink
Fargo
O Brother, Where Art Thou?
The Man Who Wasn't There
No Country for Old Man
Burn After Reading
A Serious Man
True Grit
Inside Llewyn Davis
Unbroken
Bridge of Spies
Hail, Caesar!

E/R × Relationship Set × Multiplicity



A Movie participate in Make relationship Many (More than 1) Director at max

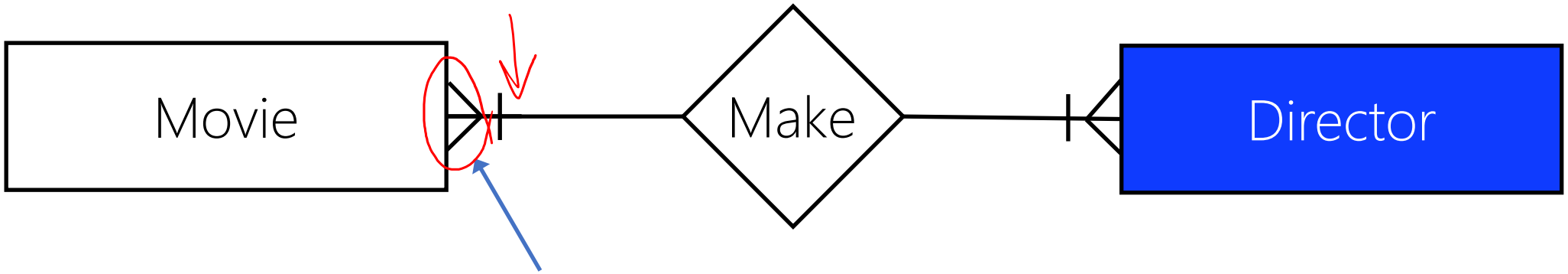
E/R × Relationship Set × Multiplicity



How about Director multiplicity (cardinality) in Make relationship? 1

A Director entity is not able to Make more than one Movie entity!

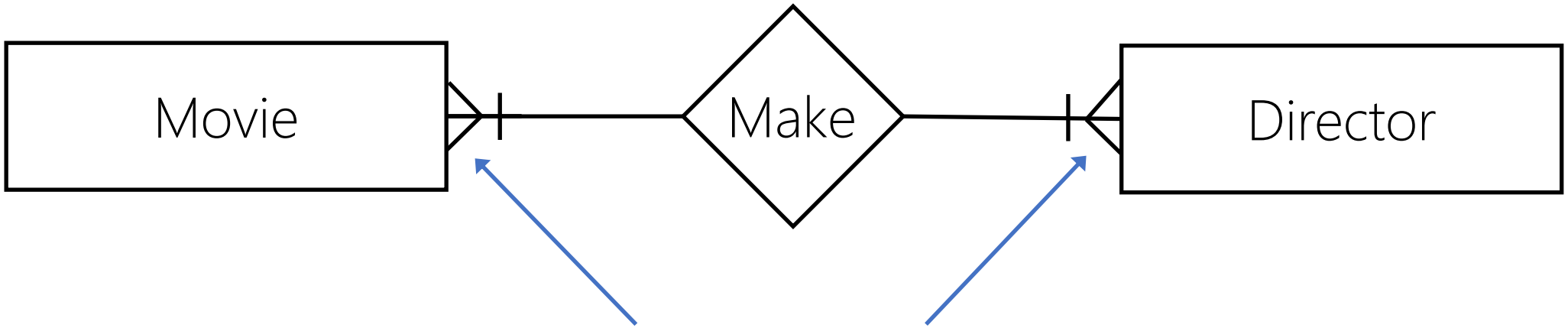
E/R × Relationship Set × Multiplicity



How about Director multiplicity (cardinality) in Make relationship? Many

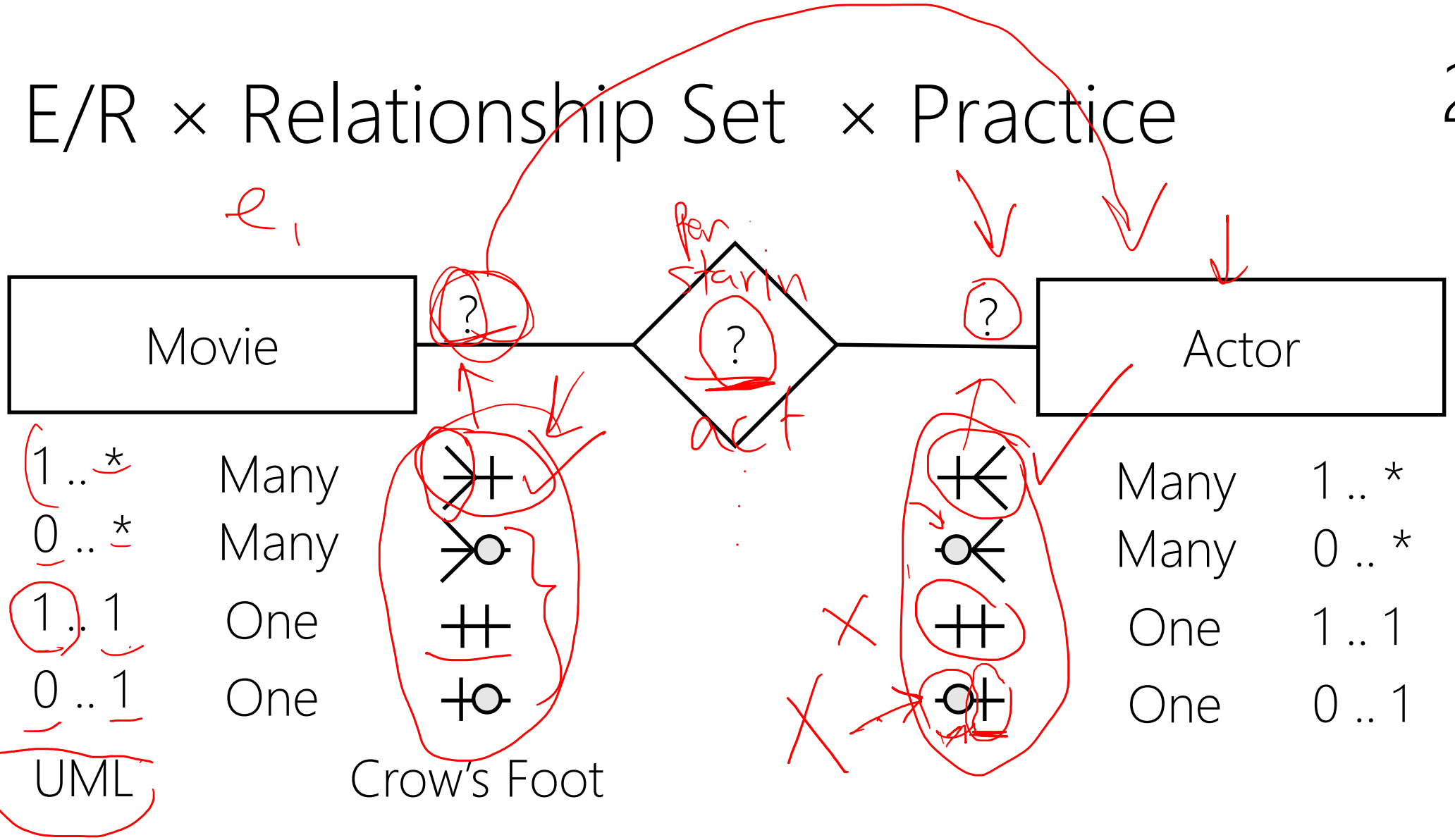
A Director entity is able to Make more than one Movie entity.

E/R × Relationship Set × Multiplicity

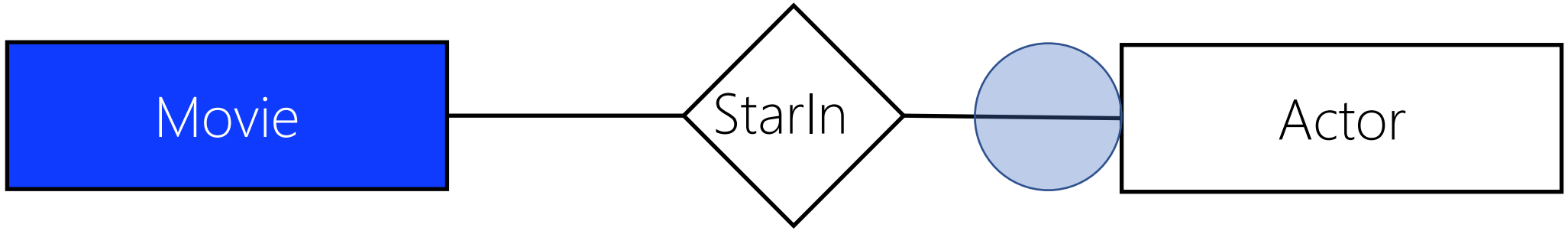


Make is a Many-Many Relationship (Set)

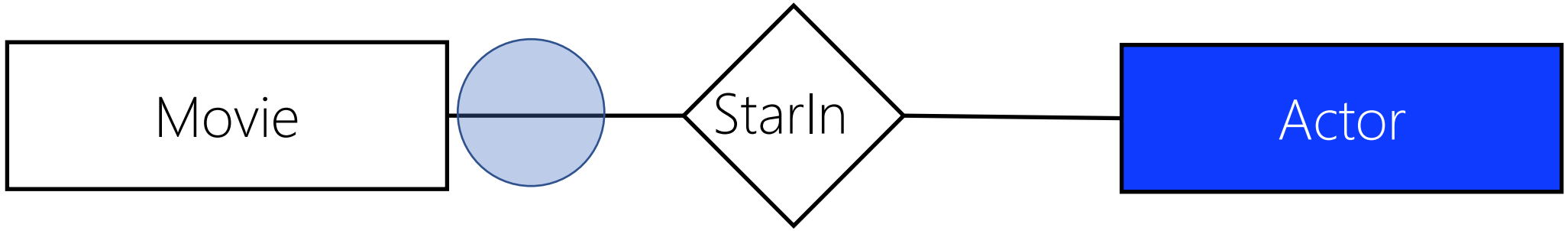
E/R × Relationship Set × Practice



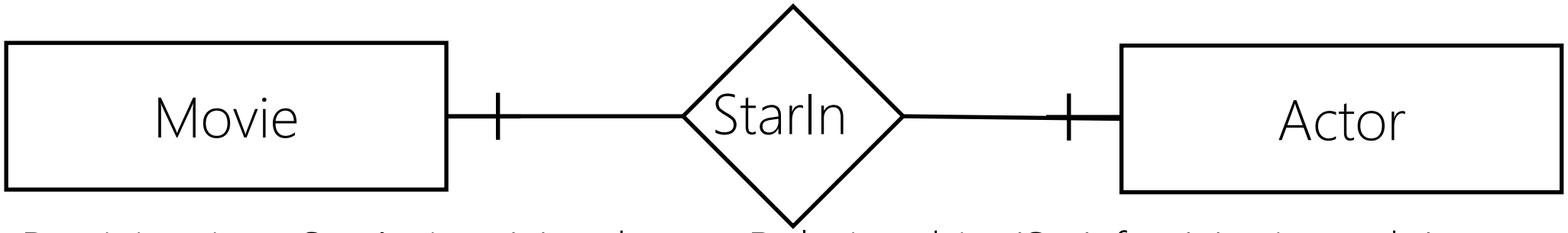
E/R × Relationship Set × Practice



E/R × Relationship Set × Practice



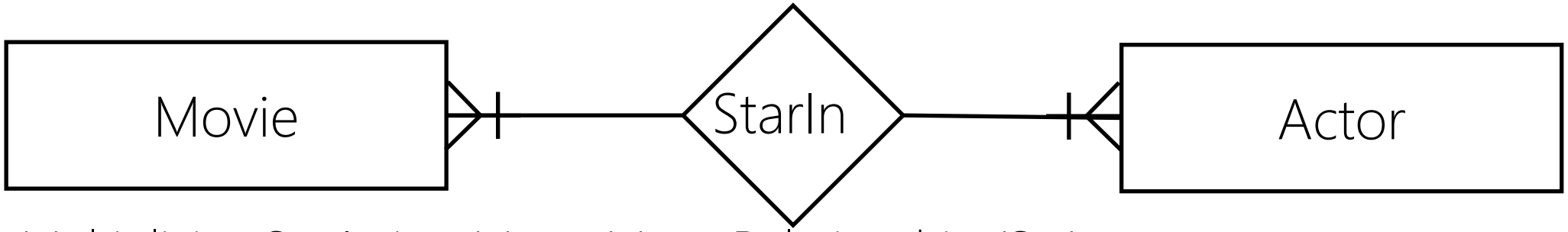
E/R × Relationship Set × Practice



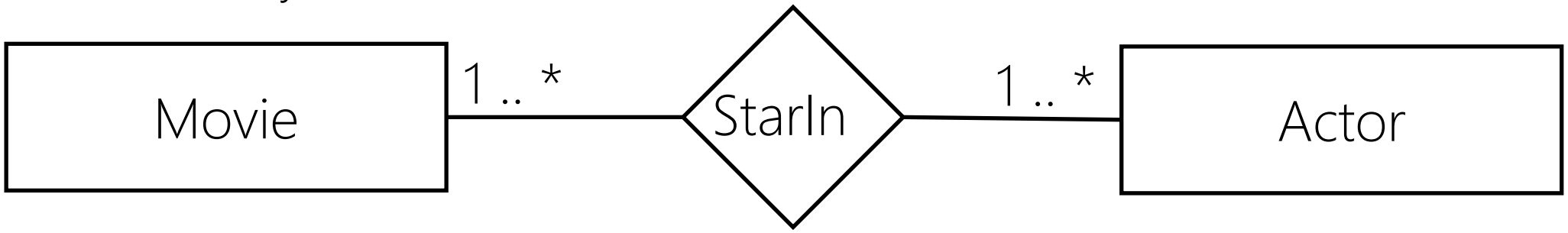
Participation: StarIn is a Mandatory Relationship (Set) for Movie and Actor

A Movie must have at least one Actor entity
An Actor must StarIn at least one Movie entity

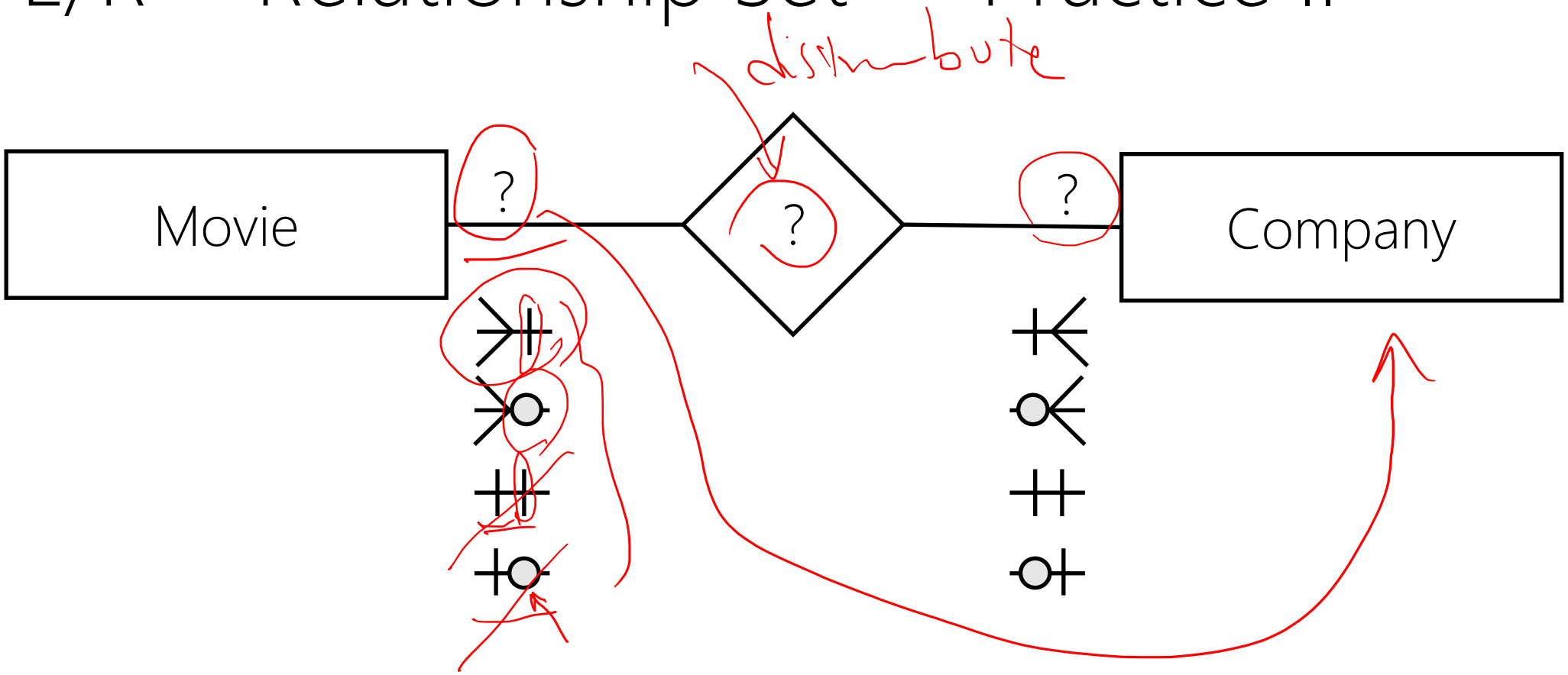
E/R × Relationship Set × Practice



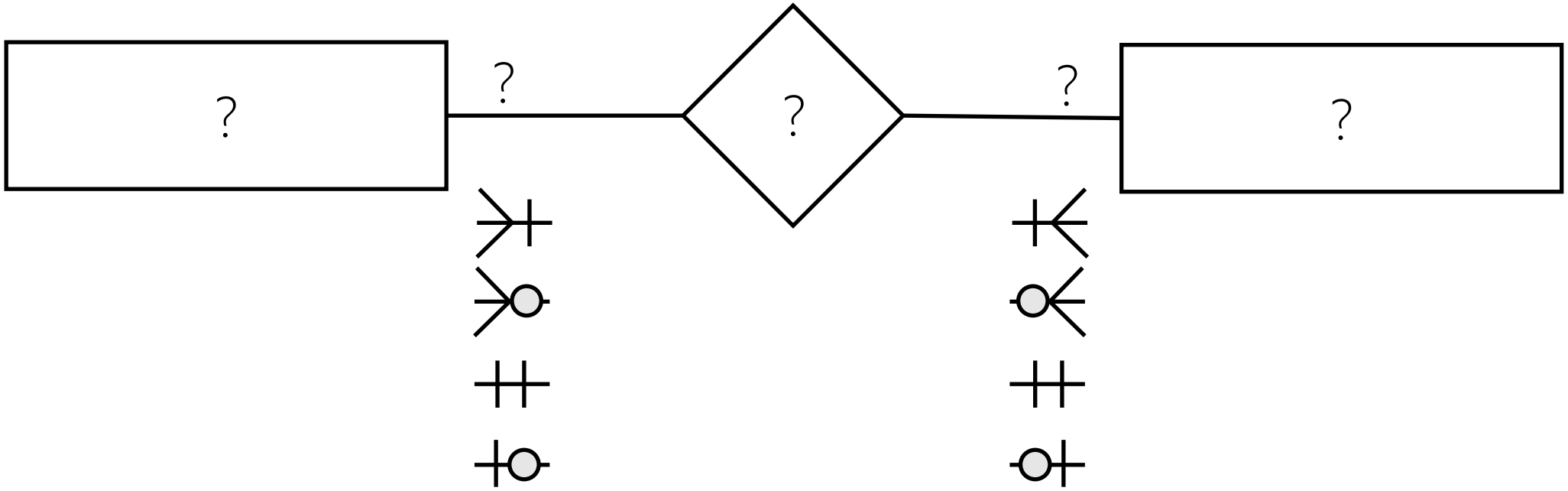
Multiplicity: StarIn is a Many-Many Relationship (Set)
A Movie may have more than one Actor entities
An Actor may StarIn more than one Movie entities



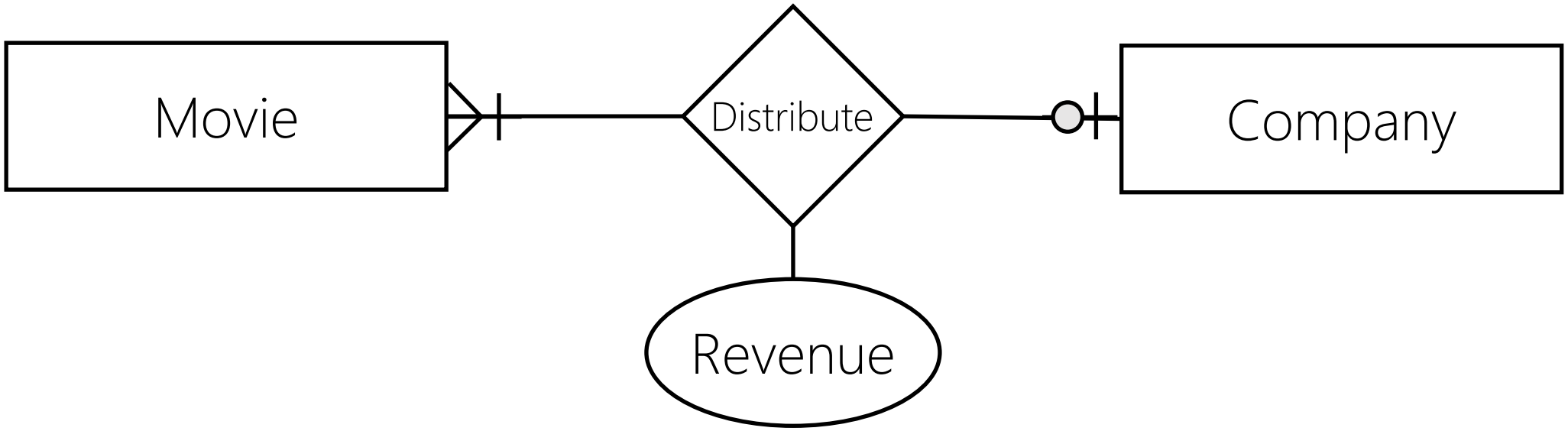
E/R × Relationship Set × Practice II



E/R × Your System (5mins)



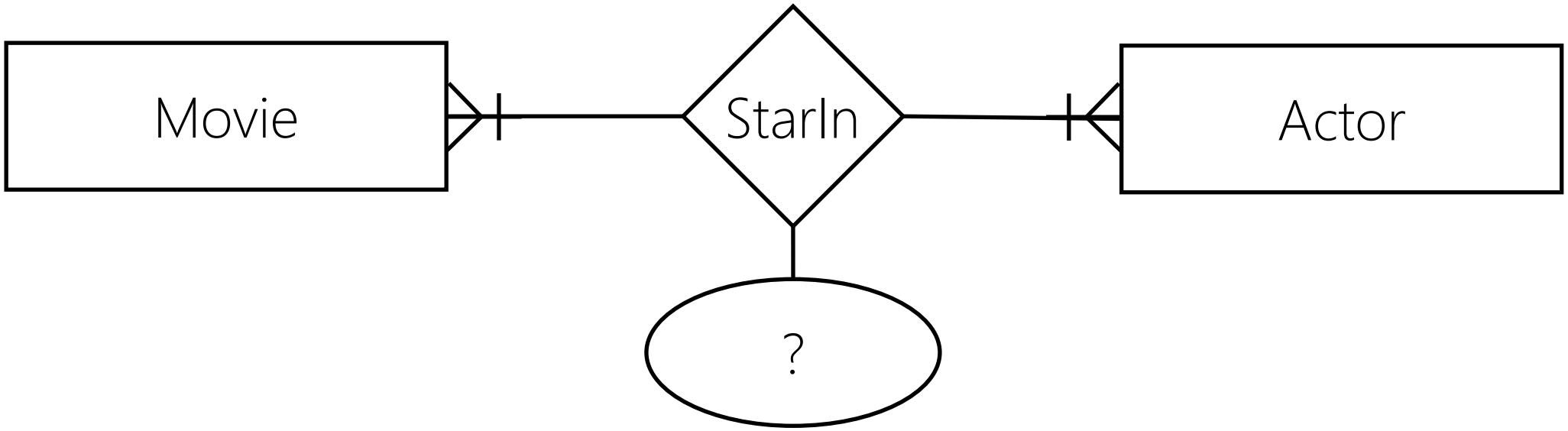
E/R × Relationship Set × Attribute



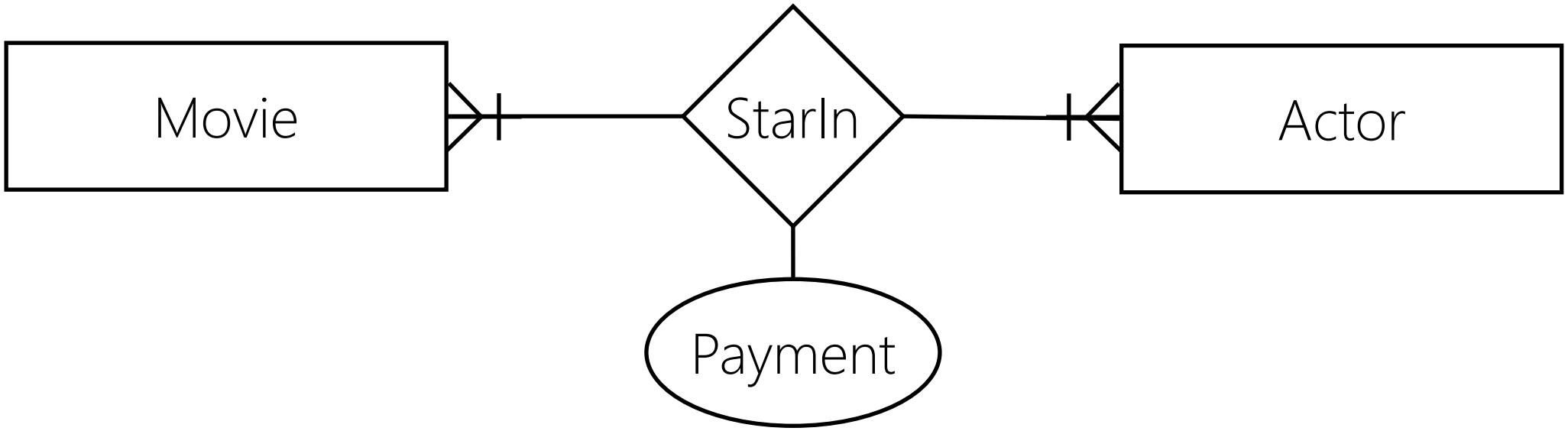
Revenue exist if and only if there is a relationship between a Movie entity and a Company entity.

e.g., *`Universal Pictures' made `$11.4 million' by distributing `The Birds'.*

E/R × Relationship Set × Attribute



E/R × Relationship Set × Attribute



Payment exist if and only if there is a relationship between a Movie entity and an Actor entity.

e.g., *`Tippi Hedren' was paid `$X' by starring in `The Birds'.*