

Last Week × Q4Me

-2

Book on D2L

The First 10%: In Progress

Book vs. Slides

W03: CH02 (1st Ed.)

Note-taker for the Course

clockwork.ryerson.ca/ClockWork/user/notetakingnotetakers/Login.aspx

Lab

?

Last Weeks

?

Last Week × Q4U

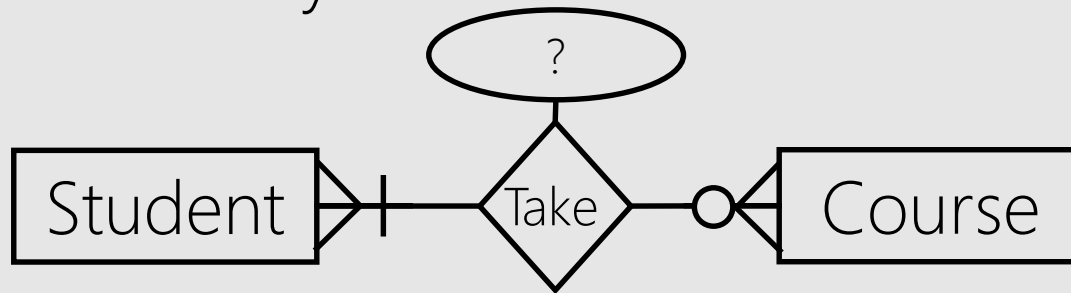
-1

What is ER Diagram for?

Types of attributes for entity set?

Ordinality?

Cardinality?



Marriage (5min)?

Last Week ×Q4U

0

What is ER Diagram for?

W02-3,6

Types of attributes for entity set?

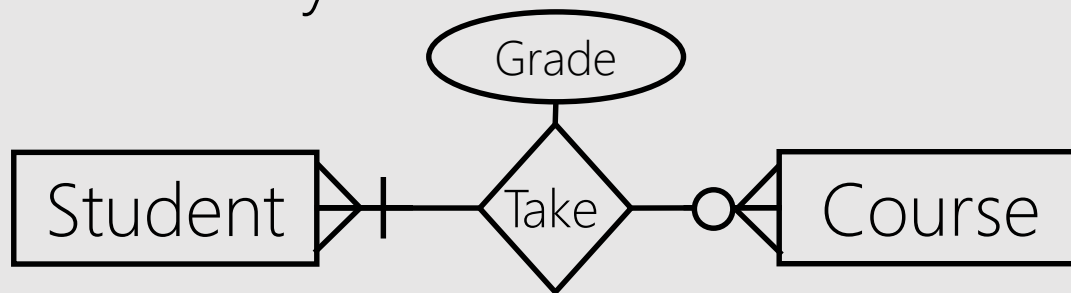
W02-17 to 25

Ordinality?

W02-46

Cardinality?

W02-47



Each course entity must have at least one student, but might have more than one student.

Each student might have no course at all or might have more than one courses.

Marriage (5min)?

Next Week 😊



Conceptual Level | Entity-Relationship Model

Today

2



Data Modeling
in
RDBMS

Real World Entity

Conceptual Level | Entity-Relationship Model (E/R)

| Logical Level | Relational Model

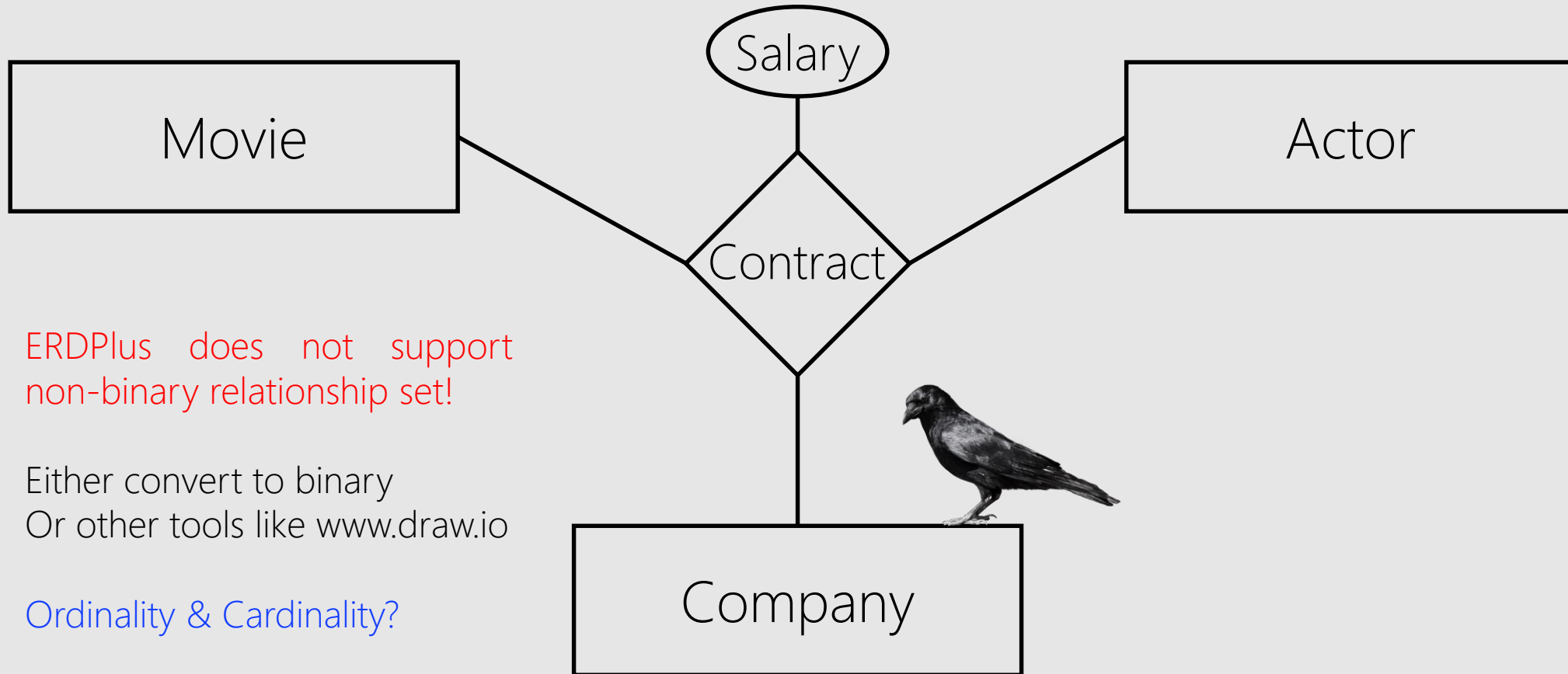
| Physical Level | SQL

Computable Entity

Last Week | Welcome | Entity | Attribute | Relationship | Extended ER (EER)

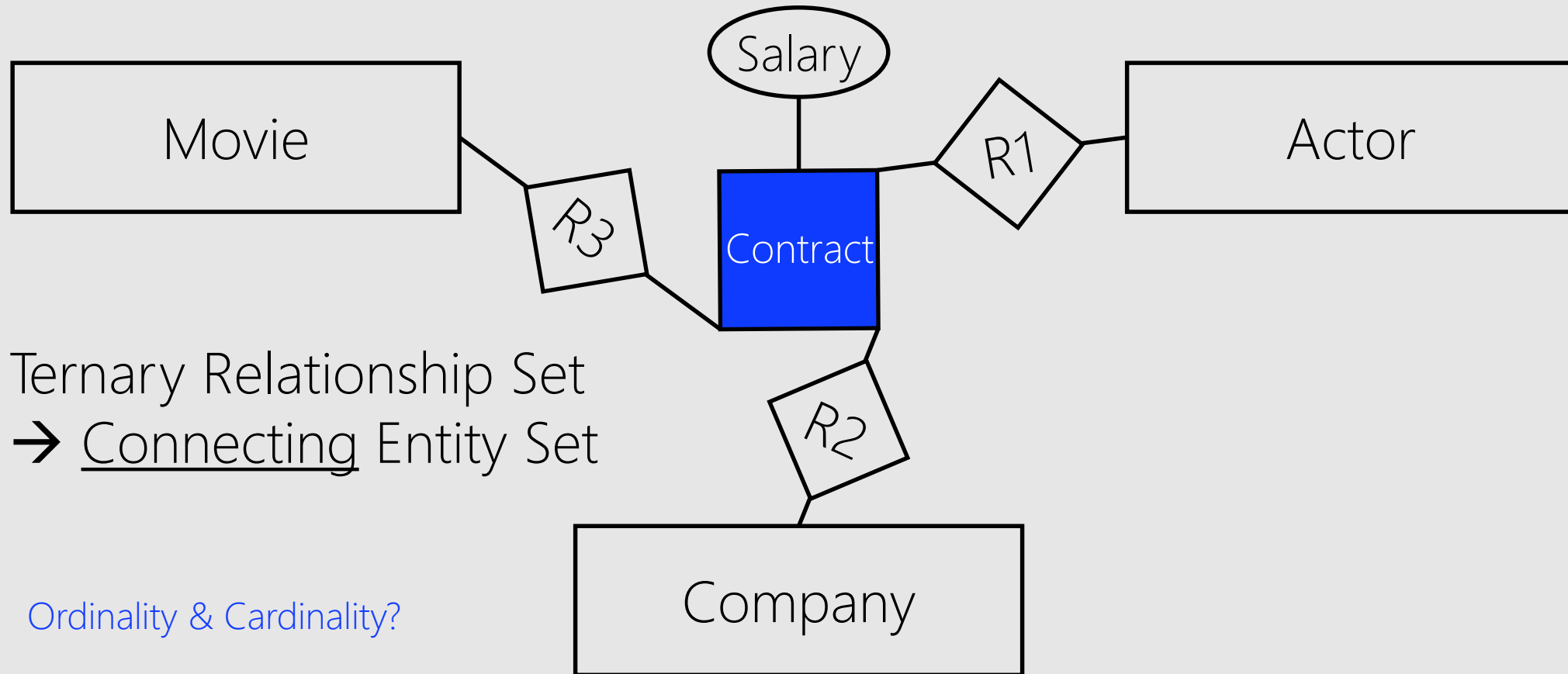
E/R × Ternary Relationship Set

3



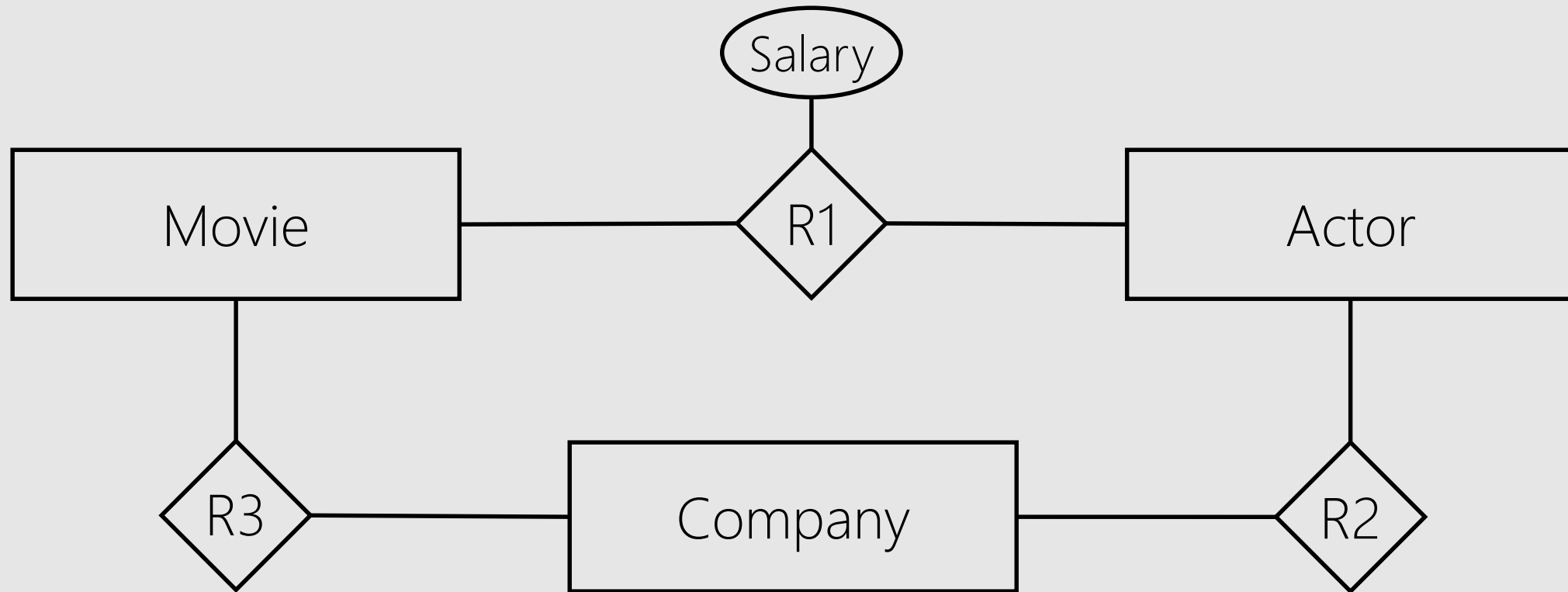
E/R × Ternary-2-Binary

4



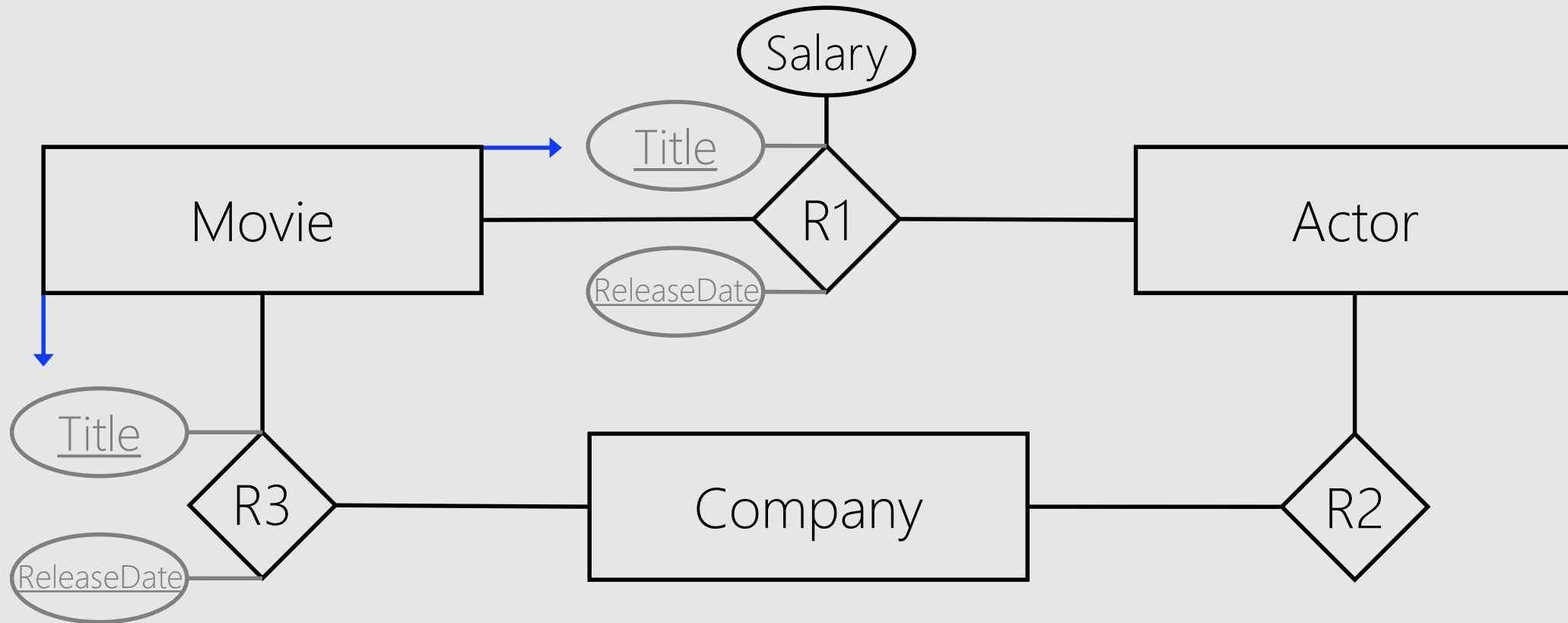
E/R × Circular Relationship Sets

5



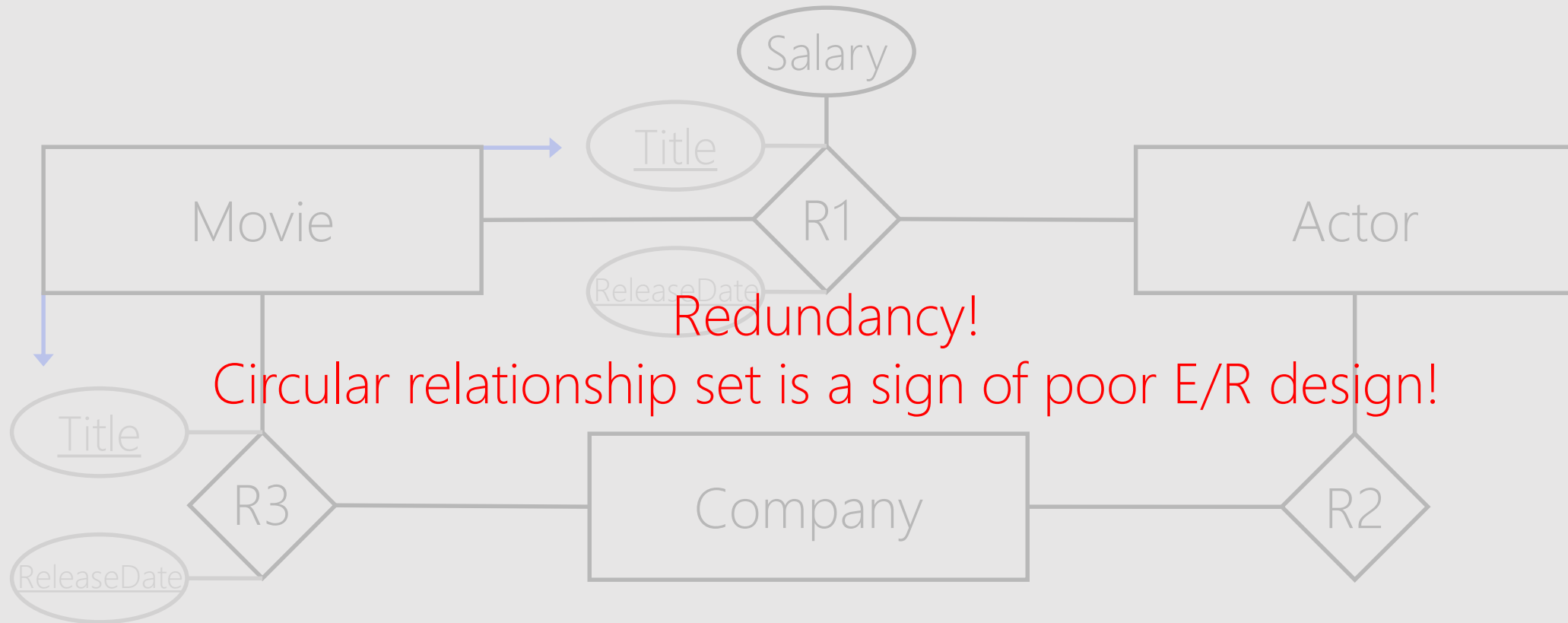
E/R × Circular Relationship Sets

6



E/R × Circular Relationship Sets

7



E/R × Weak Entity Set

8

By definition any entity set MUST have key.

At worst, if there is no key attribute(s), all attributes are in key set.

This guarantees that there is no duplicate entities in entity set.

HOWEVER,

55 King Street West, Suite 700
 Kitchener ON N2G 4W1
 Phone: (800) 556-1971
 Fax: (888) 849-1760

Invoice

*** 20% RESTOCKING FEE ON RETURNED ITEMS***

ALL WARRANTIES ARE MANUFACTURER'S STATED TERMS AND CONDITIONS

NO RETURNS ACCEPTED WITHOUT PRE-AUTHORIZED APPROVAL

Date	Page
5/7/18	1

Invoice Number IN620995

Due Date

PAID BY CREDIT CARD

Sold To:

HOSSEIN FANI

Ship To:

HOSSEIN FANI

Order No.	Order Date	Customer No.	Salesperson	PO Number	Ship Via	Terms
1805043501	May 4, 2018		PCCANADA			Credit Card

Qty. Ord.	Qty. Shp.	Qty. B/O	Item Number	Description	Unit Price	UOM	Extended Price
1	1	0	CYB-CRA50005	CYBERPOWER CARBON CRA50005 RACK SHELF - 19 1U WIDE X 32.70	90.99	EACH	90.99
			PCFRT	SHIPPING FEE			48.99

Comments:

HST 89527 0213 RT001
 QST 1202169020

Tax summary:

Subtotal
Total sales tax

Total amount

Paid in Full

55 King Street West, Suite 700
Kitchener ON N2G 4W1
Phone: (800) 556-1971
Fax: (888) 849-1760

Invoice

Date

5/9/18

Page

1

Invoice Number

IN621412

*** 20% RESTOCKING FEE ON RETURNED ITEMS***

ALL WARRANTIES ARE MANUFACTURER'S STATED TERMS AND CONDITIONS

NO RETURNS ACCEPTED WITHOUT PRE-AUTHORIZED APPROVAL

Due Date

PAID BY CREDIT CARD

Sold To:

HOSSEIN FANI

Ship To:

HOSSEIN FANI

Order No.	Order Date	Customer No.	Salesperson	PO Number	Ship Via	Terms
1805091667	May 9, 2018		PCCANADA			Credit Card

Qty. Ord.	Qty. Shp.	Qty. B/O	Item Number	Description	Unit Price	UOM	Extended Price
1	1	0	CYB-CRA50005	CYBERPOWER CARBON CRA50005 RACK SHELF - 19 1U WIDE X 32.70	90.99	EACH	90.99
			PCFRT	SHIPPING FEE			48.99

Comments:

HST 89527 0213 RT001
QST 1202169020

Tax summary:

Subtotal

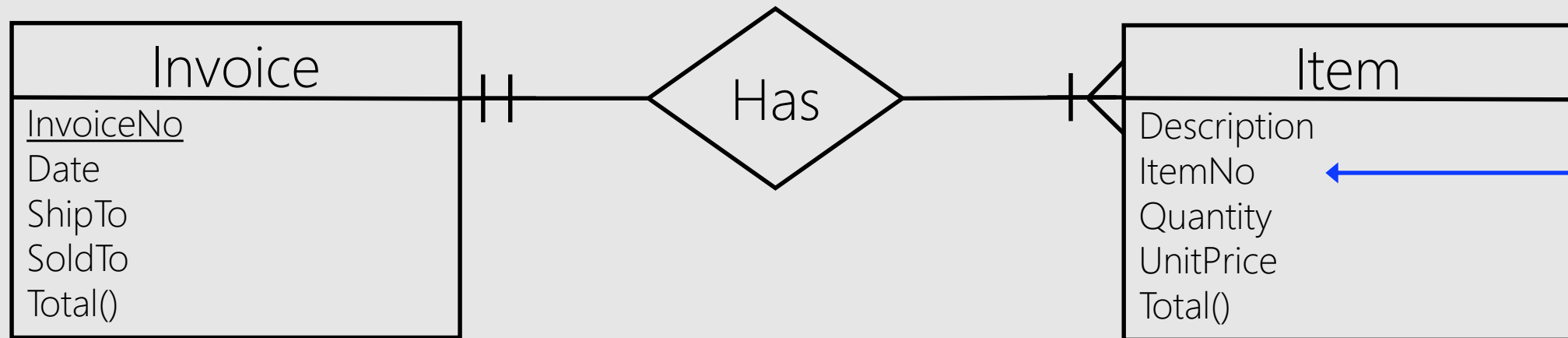
Total sales tax

Total amount

Paid in Full

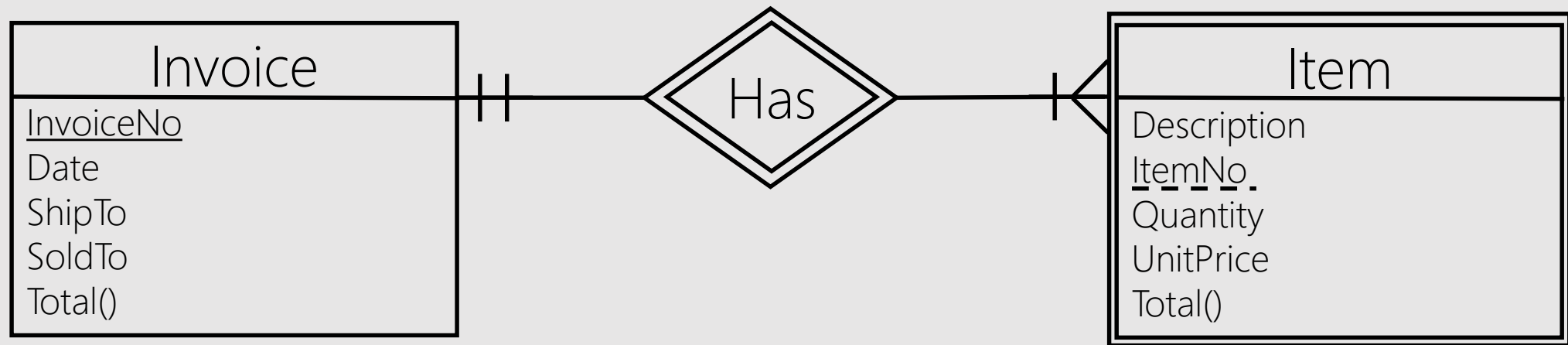
E/R × Weak Entity Set

11



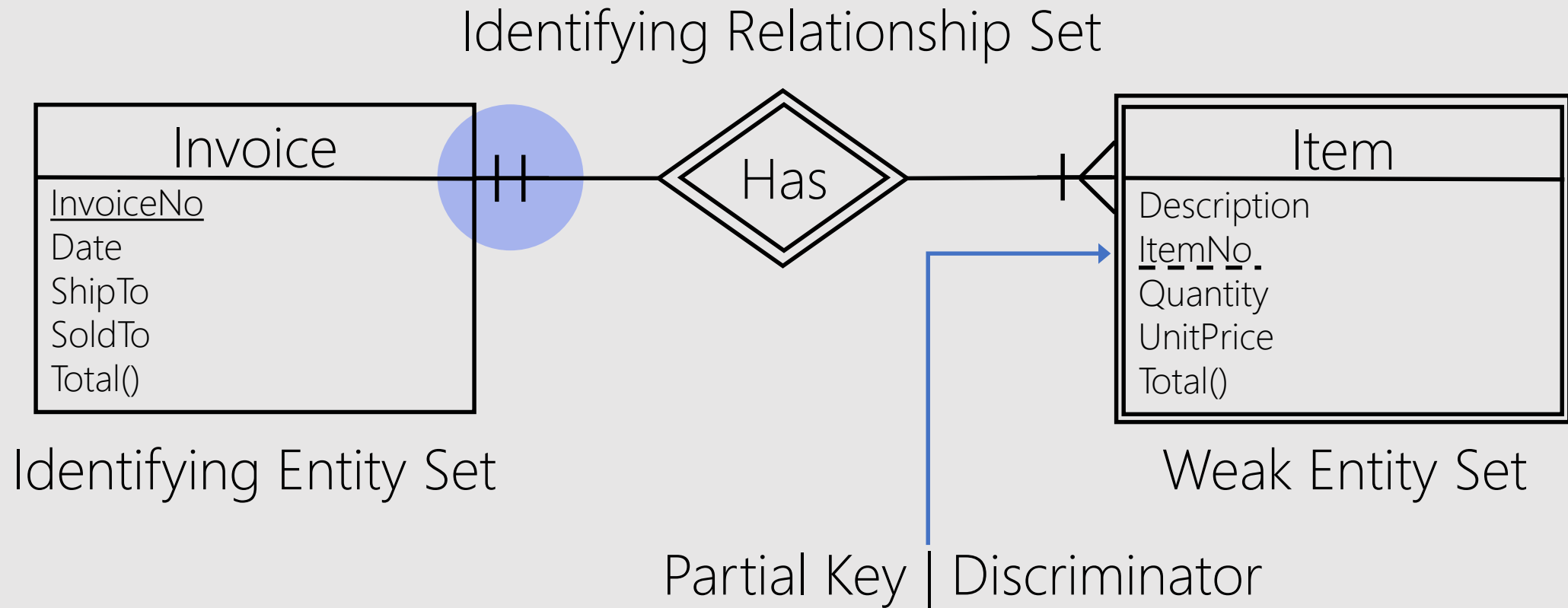
E/R × Weak Entity Set

12



E/R × Weak Entity Set

13



E/R × Weak Entity Set

14

Weak entity set originally does not have key set

Weak entity set might have partial key set or none

The key set of weak entity set is then:

{key set of identifying entity set} \cup {partial key set if any}

E/R × Weak Entity Set

15

Another example in banking?

DATE 2 0
T T T T M M O O

PAY TO THE ORDER OF _____ \$ _____

100 DOLLARS

HSBC

MEMO _____



1: 12345 0161:

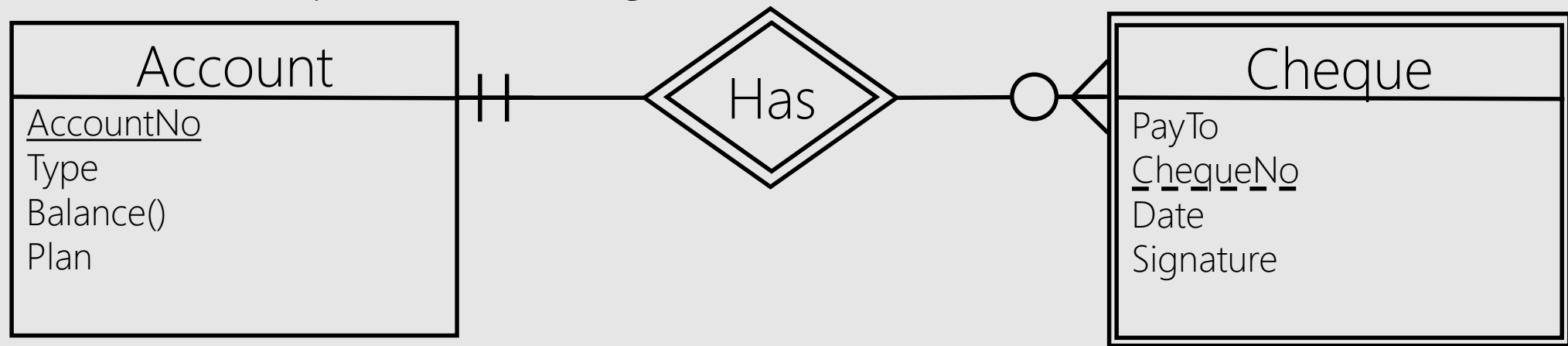


123456 789"

E/R × Weak Entity Set

17

Another example in banking?



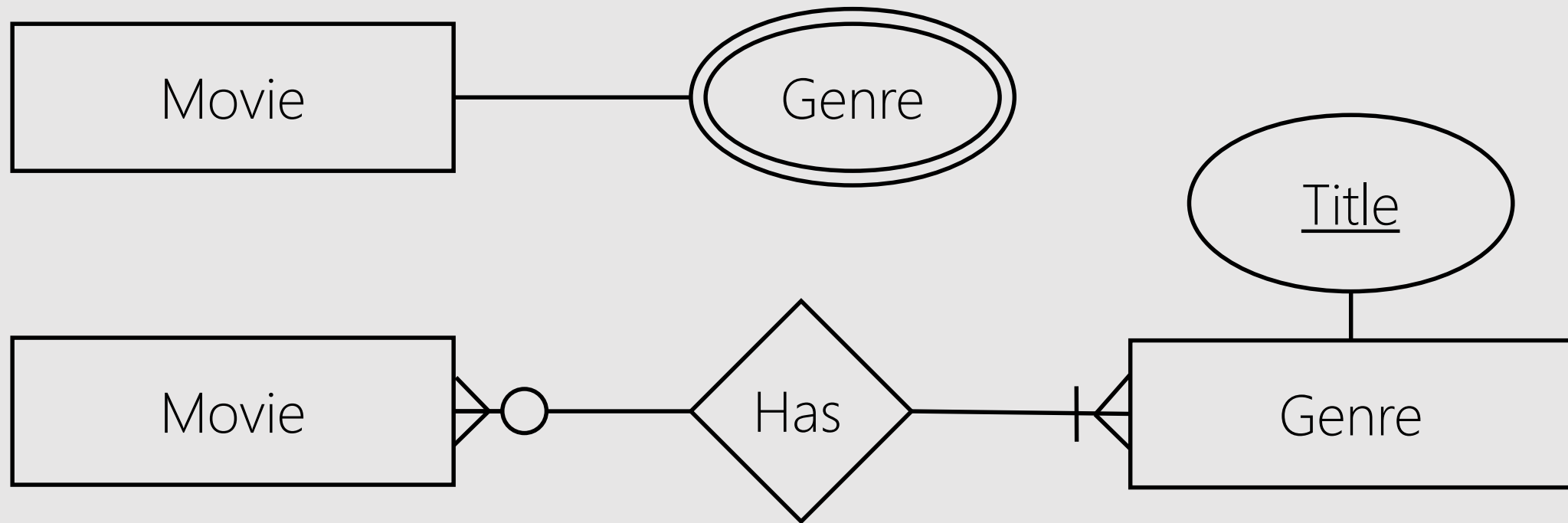
E/R × Design Principles

18

Faithfulness	e.g., entity set attribute acc. system spec.
Redundancy	e.g., circular relationship sets
Simplicity	e.g., single attribute key

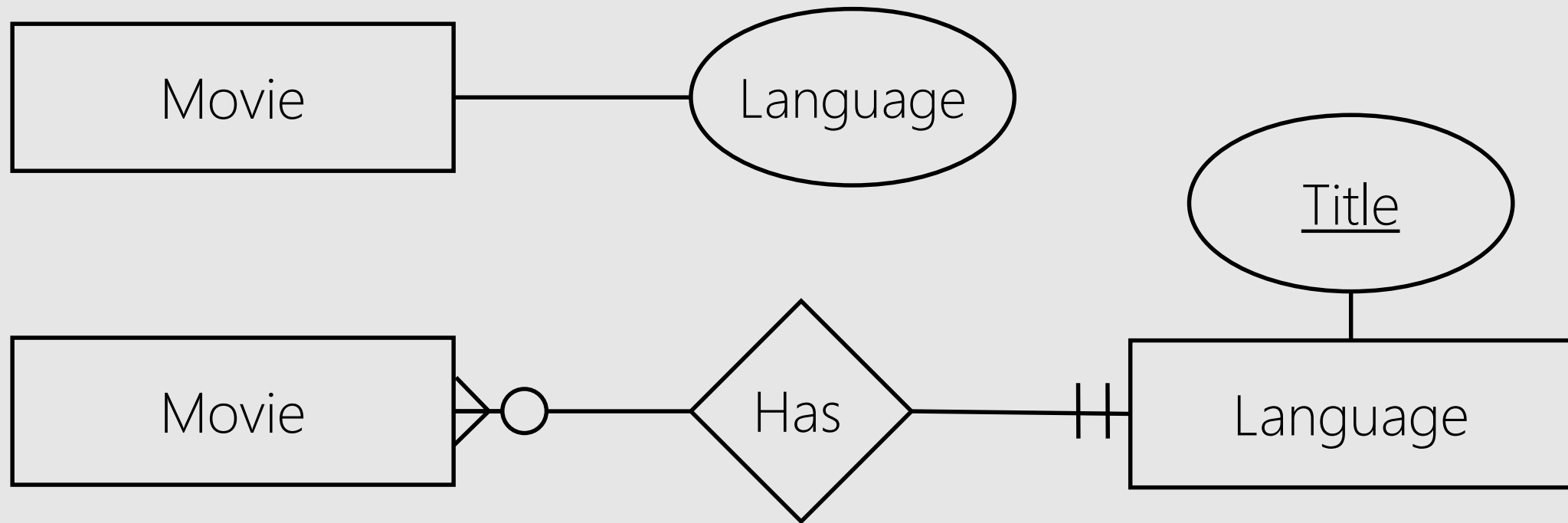
E/R × Design Questions I

19



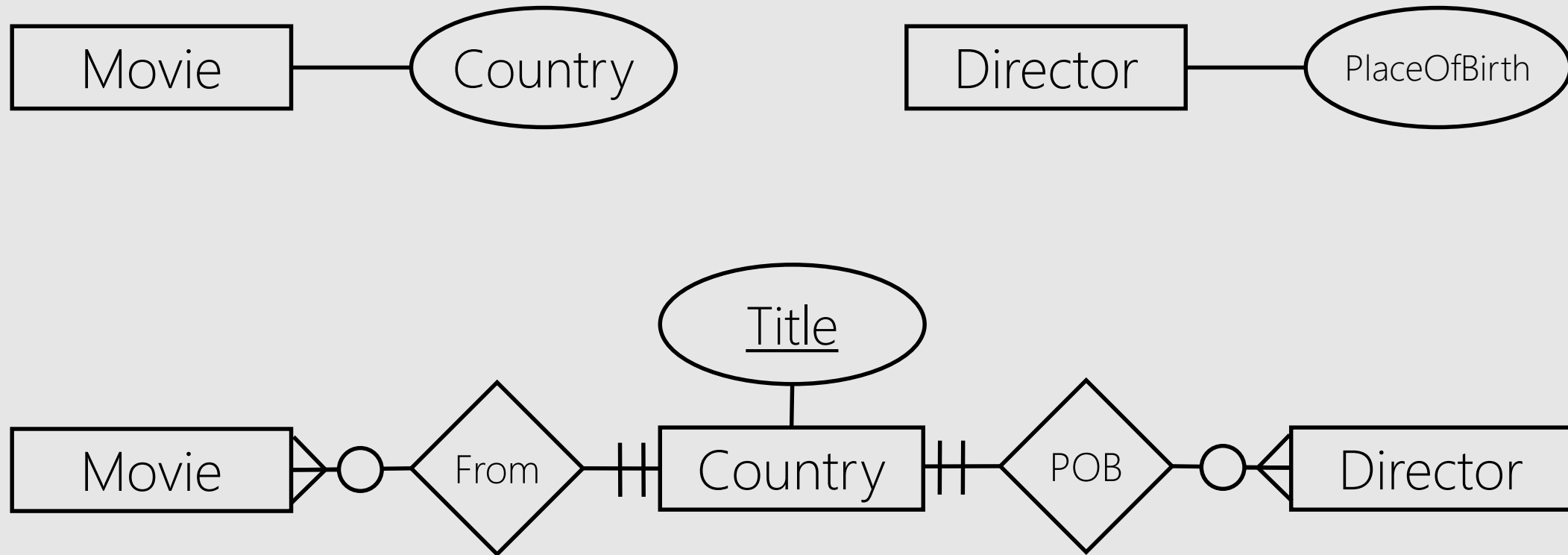
E/R × Design Questions I

20



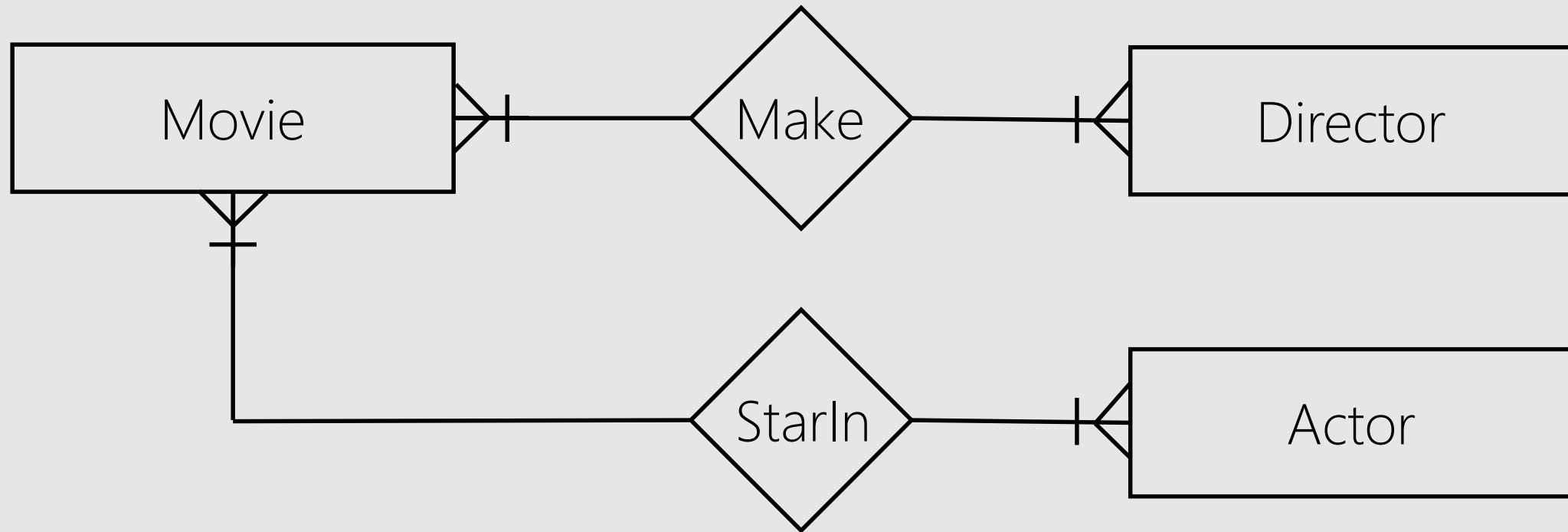
E/R × Design Questions I

21



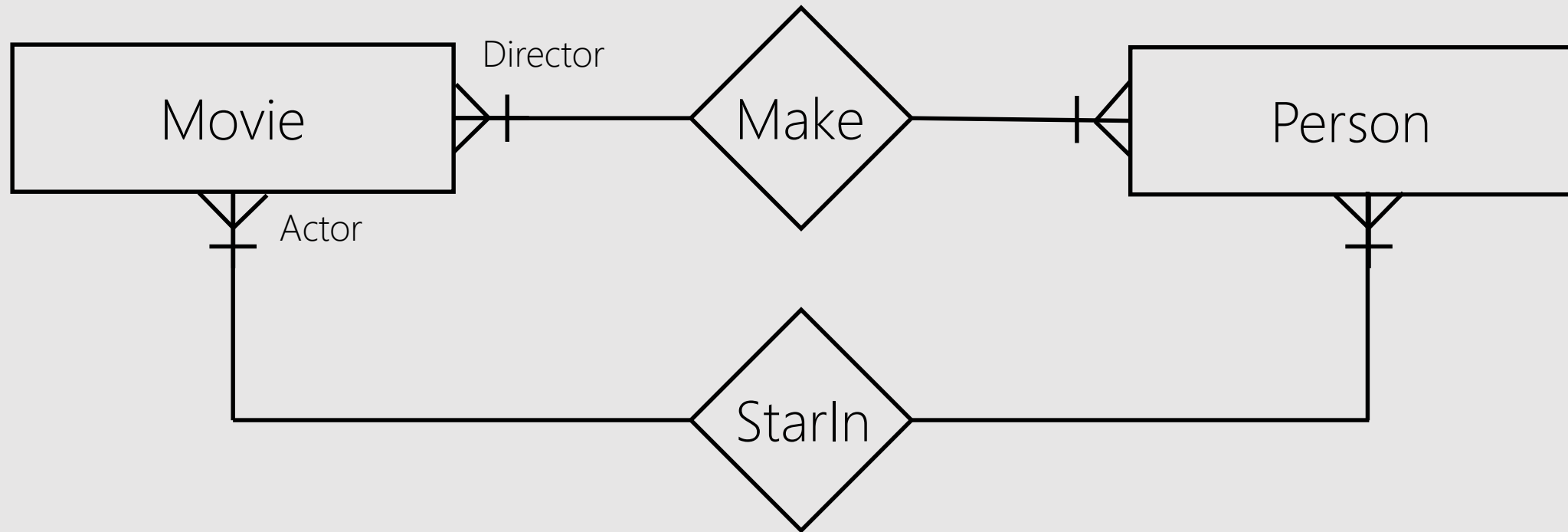
E/R × Design Questions II

22



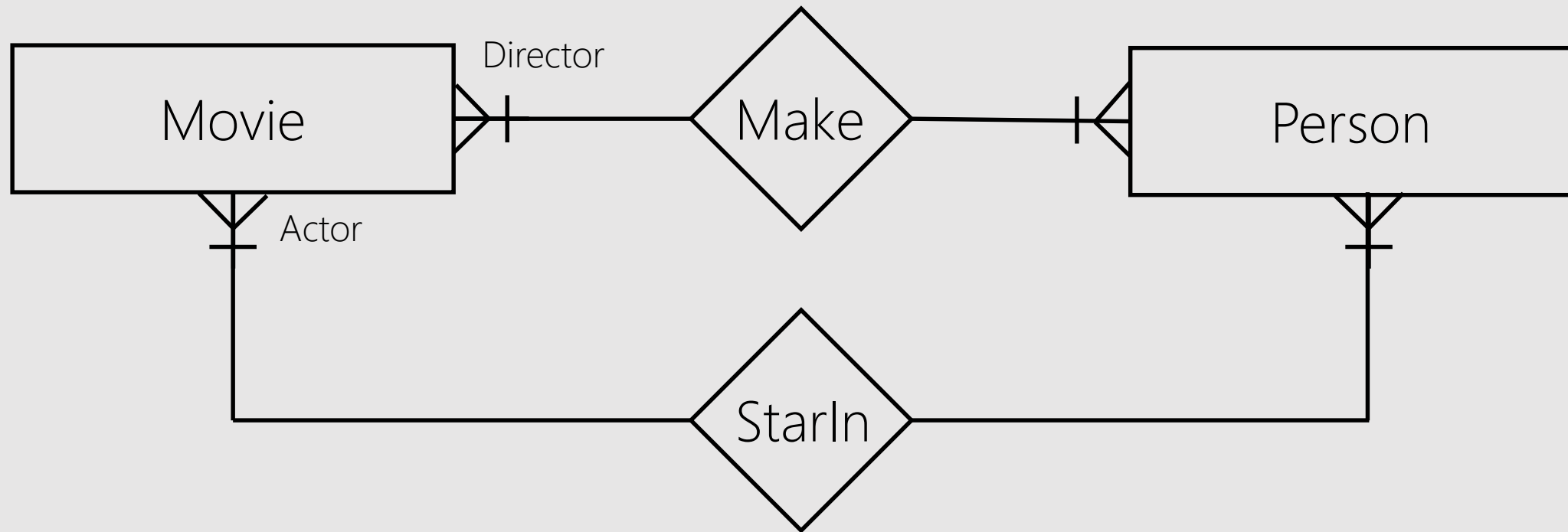
E/R × Design Questions II

23



E/R × Design Questions II

24



Same problem as in Distributor and Producer Companies! W02-62:67

E/R × Design Questions III

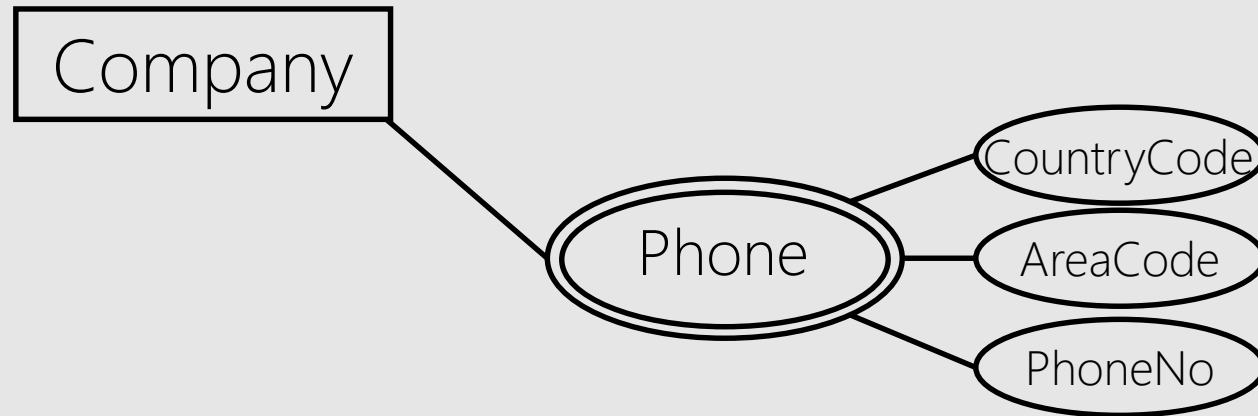
25

Multivalued & Composite Attribute?

E/R × Design Questions III

26

Multivalued & Composite Attribute? Yes.



E/R × Design Questions III

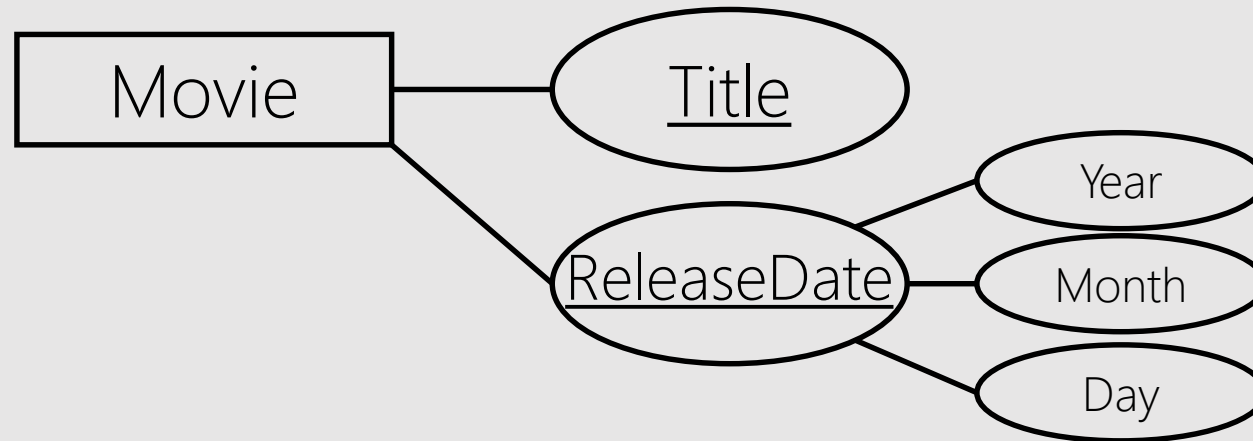
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Key & Composite?

E/R × Design Questions III

28

Key & Composite? Yes.



E/R × Design Questions III

29

Multivalued & Composite Attribute? Yes.

Key & Composite? Yes.

Key & Multivalued? No!

Key & Derived?

Derived & Multivalued?

Derived & Composite?

...

E/R × Extension

30

IS-A

E/R × ISA

31

Actor
(<u>Name</u>)
(<u>DateOfBirth</u>)
(PlaceOfBirth)
Age()
BestLine
MovieCount

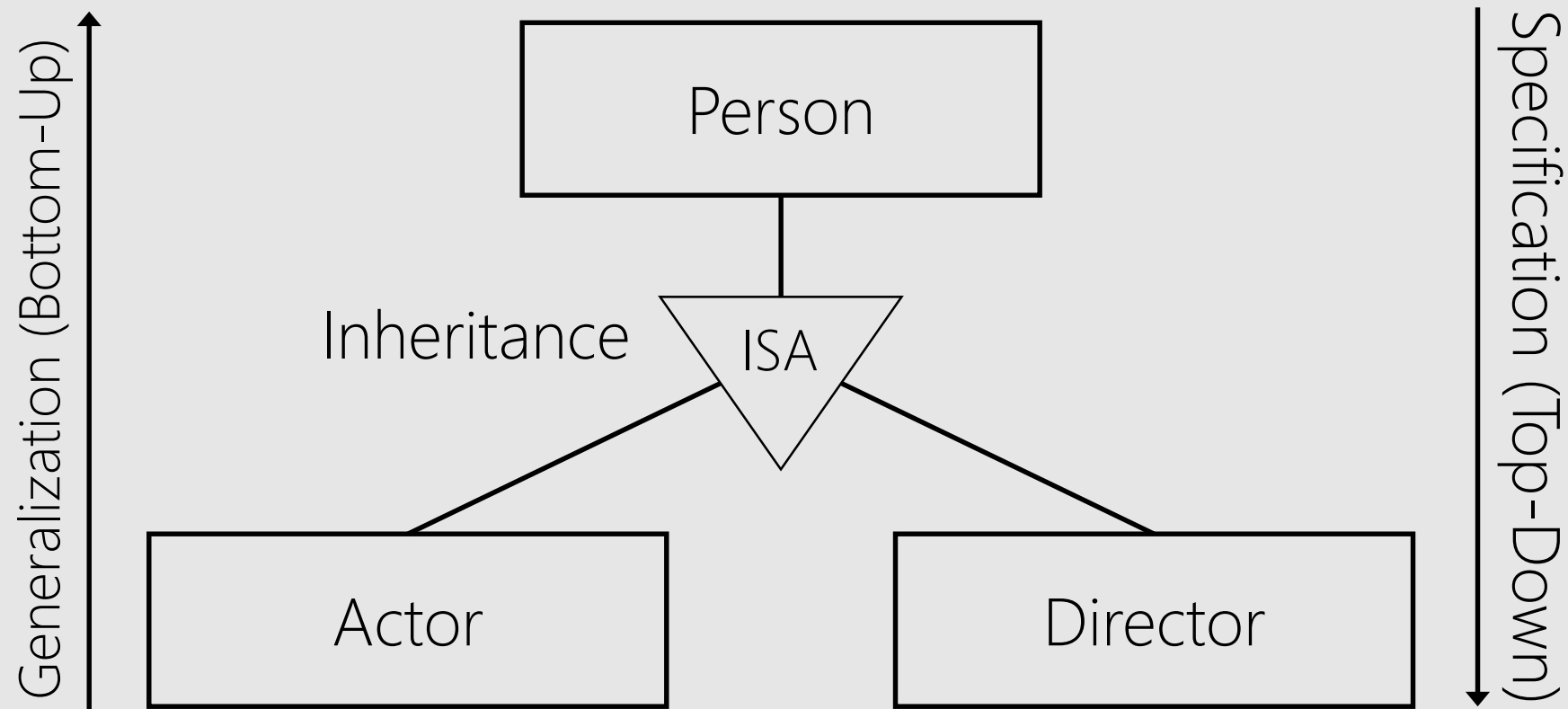
Both are person,
so they have
person's properties
like name, age, ...

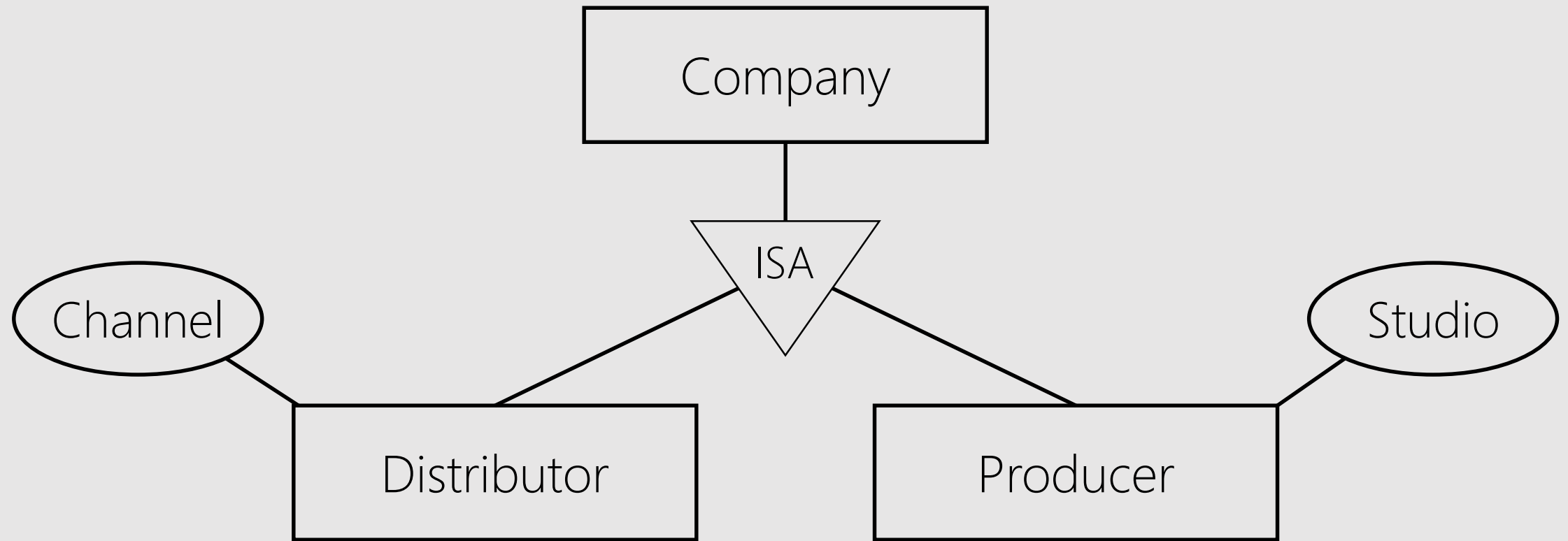
Director
(<u>Name</u>)
(<u>DateOfBirth</u>)
(PlaceOfBirth)
Age()
BestMovie
MovieCount

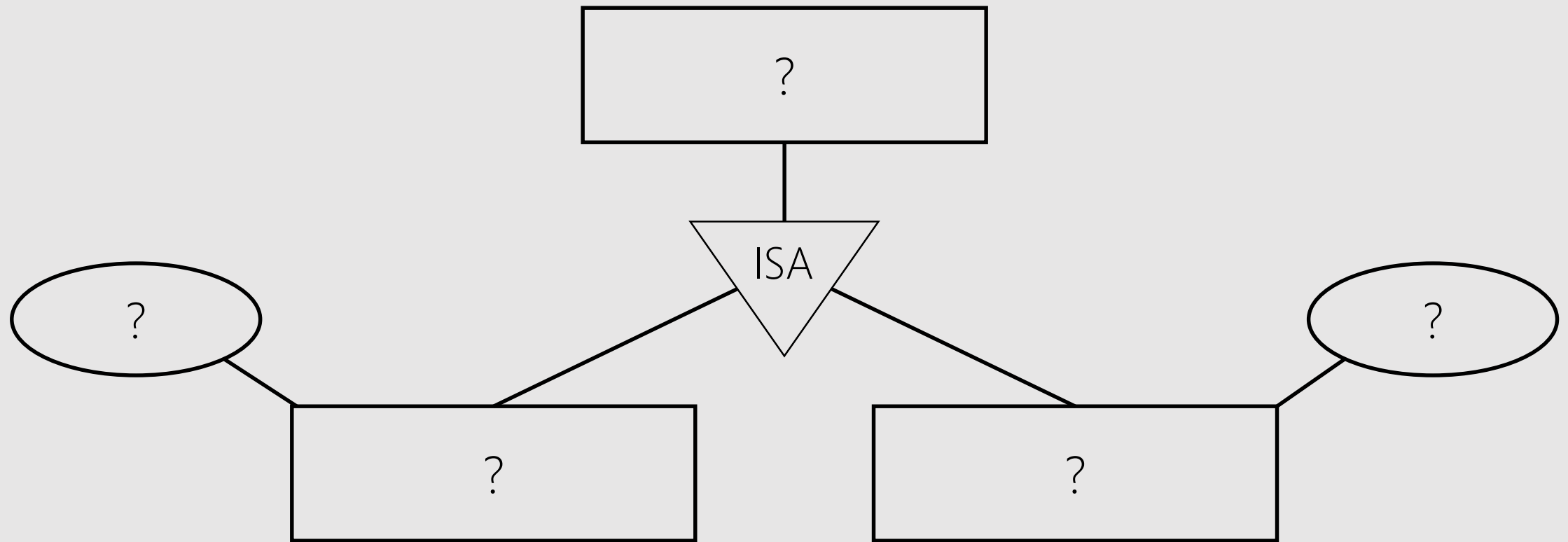
E/R × ISA

32



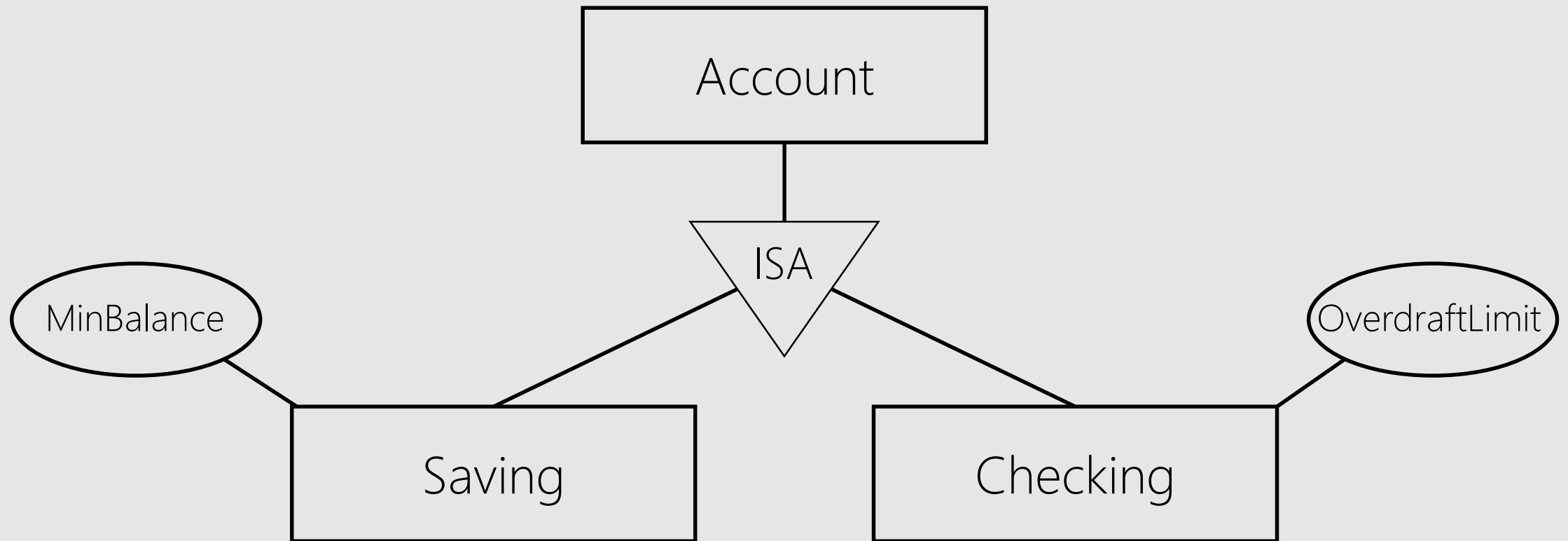






E/R × ISA × Banking

36



E/R × ISA × Constraints

37

Total Specification

An entity from parent entity set MUST be a member of at least one child entity set

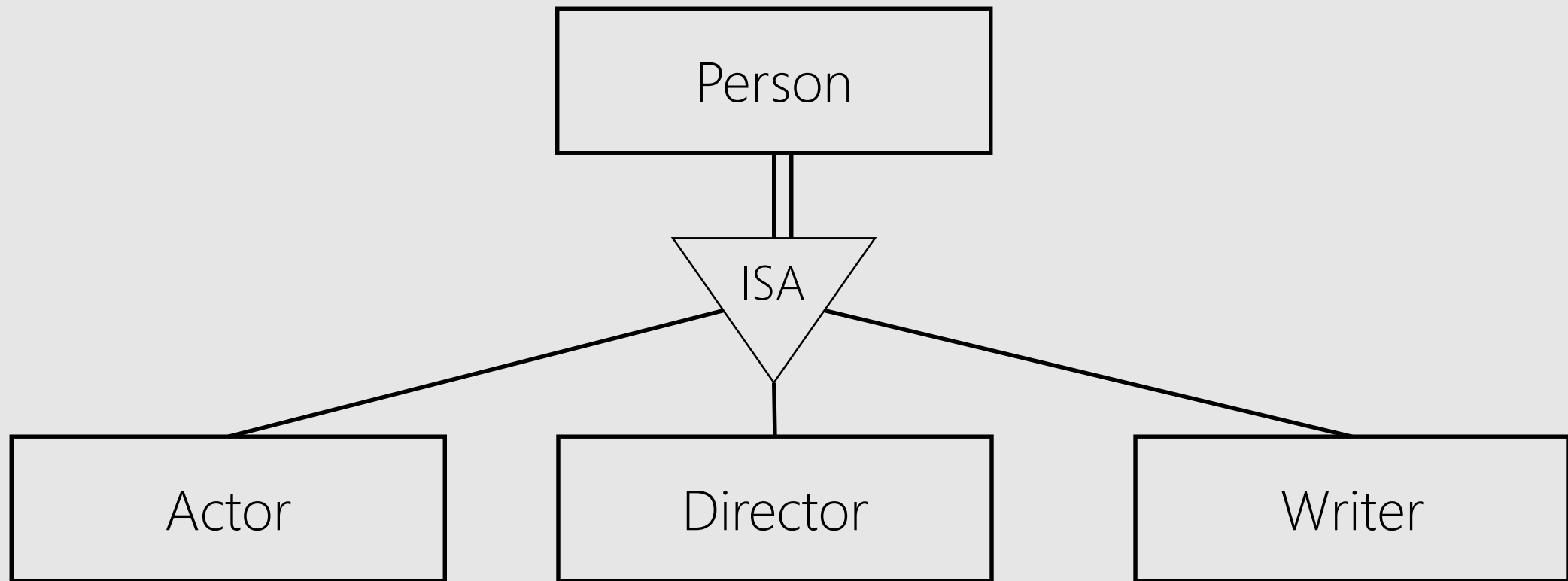
Partial Specification

An entity from parent entity set might NOT be a member of any child entity set

E/R × ISA × Total

38

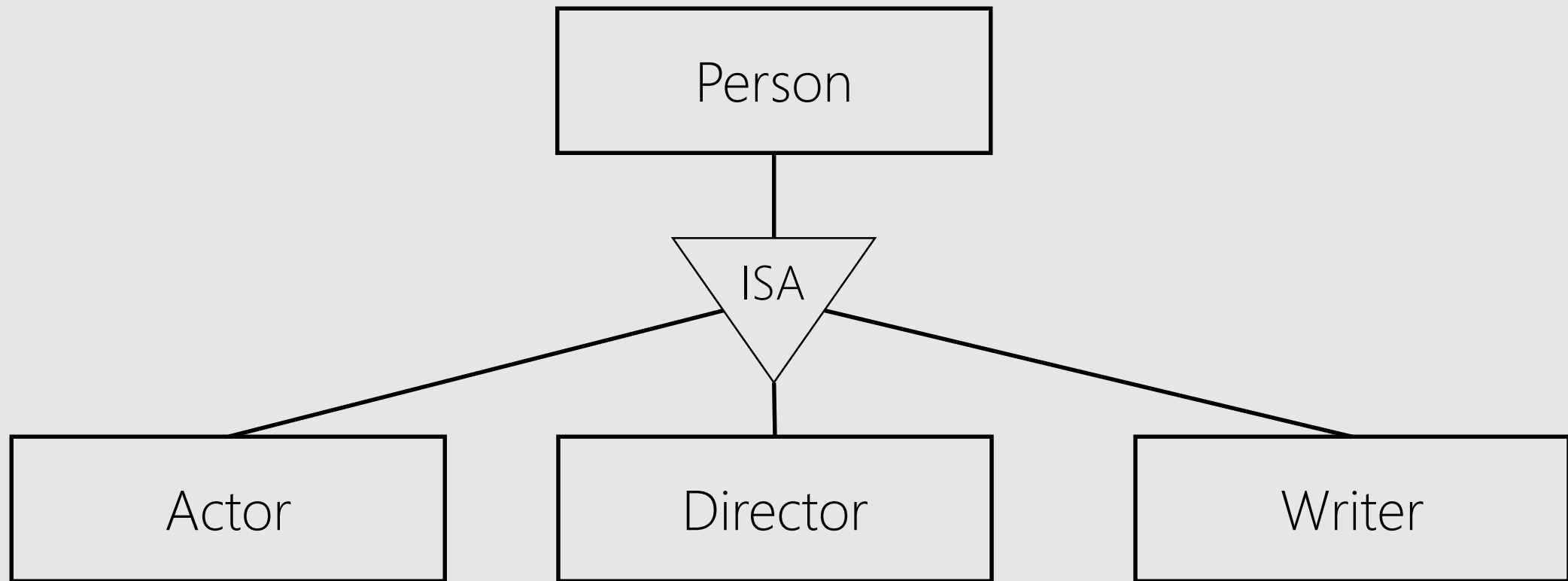
A Person entity MUST be either Actor or Director or Writer



E/R × ISA × Partial

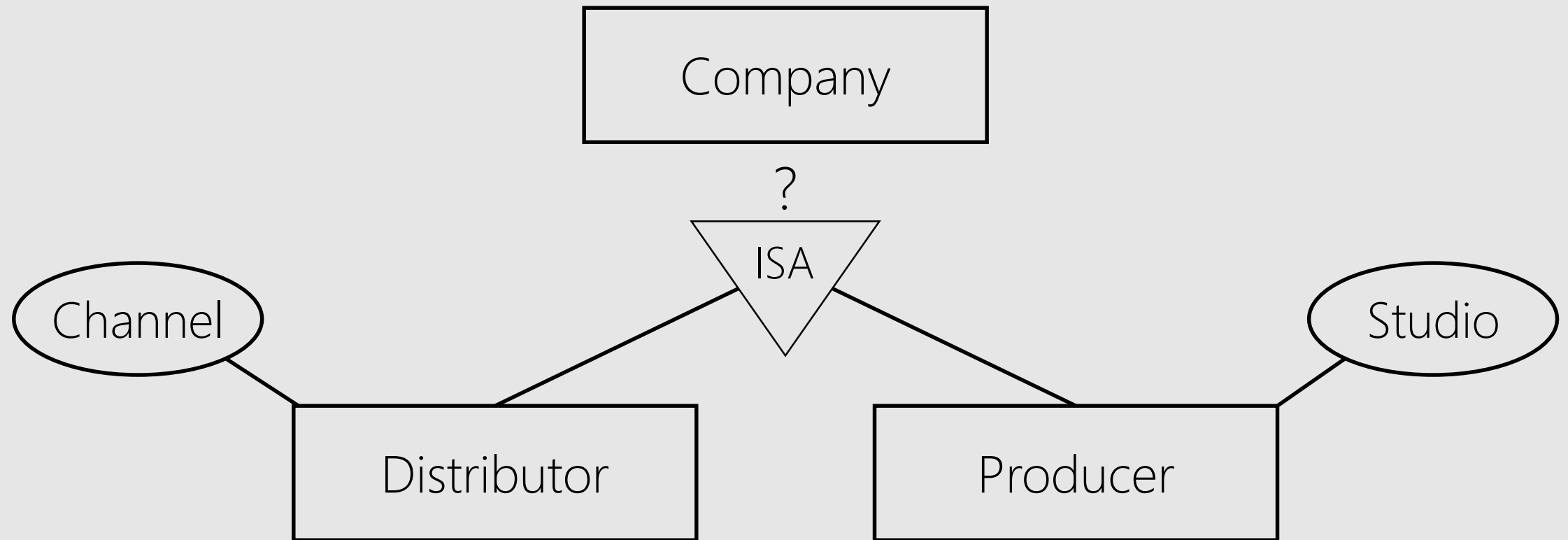
39

A Person entity might be neither Actor nor Director nor Writer



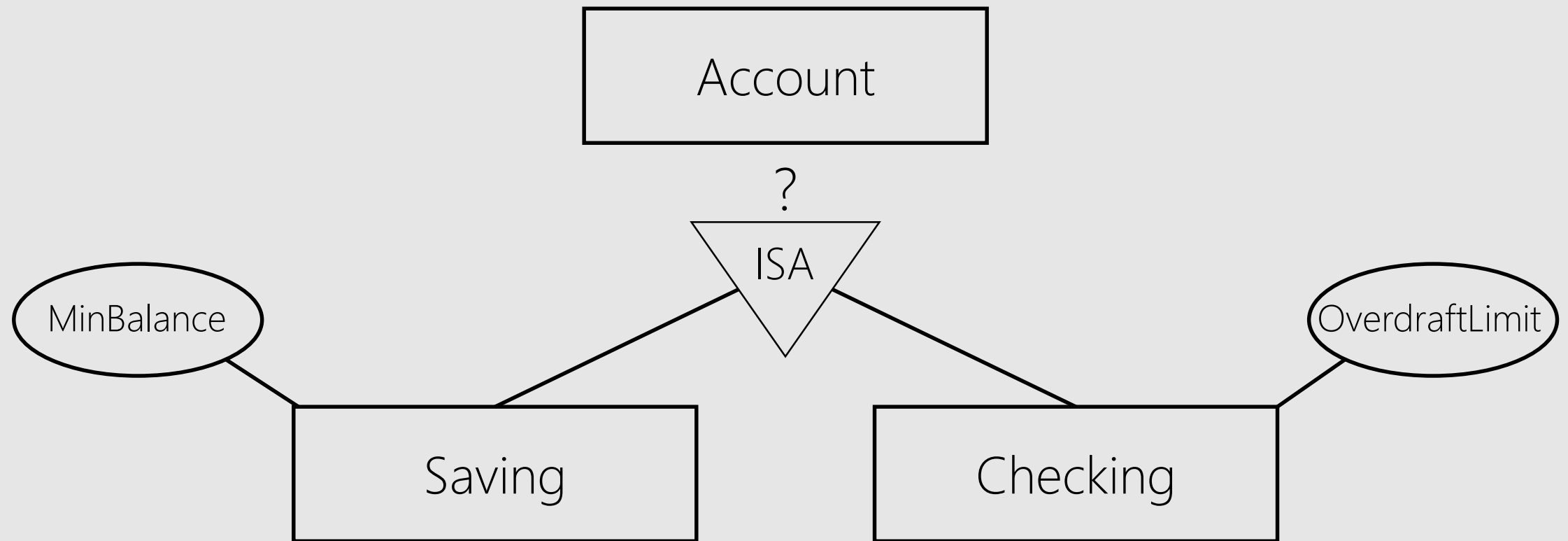
E/R × ISA × Total vs. Partial

40



E/R × ISA × Total vs. Partial

41



E/R × ISA × Constraints

42

Overlapping Specification

An entity from parent entity set might be a member of more than one child entity set

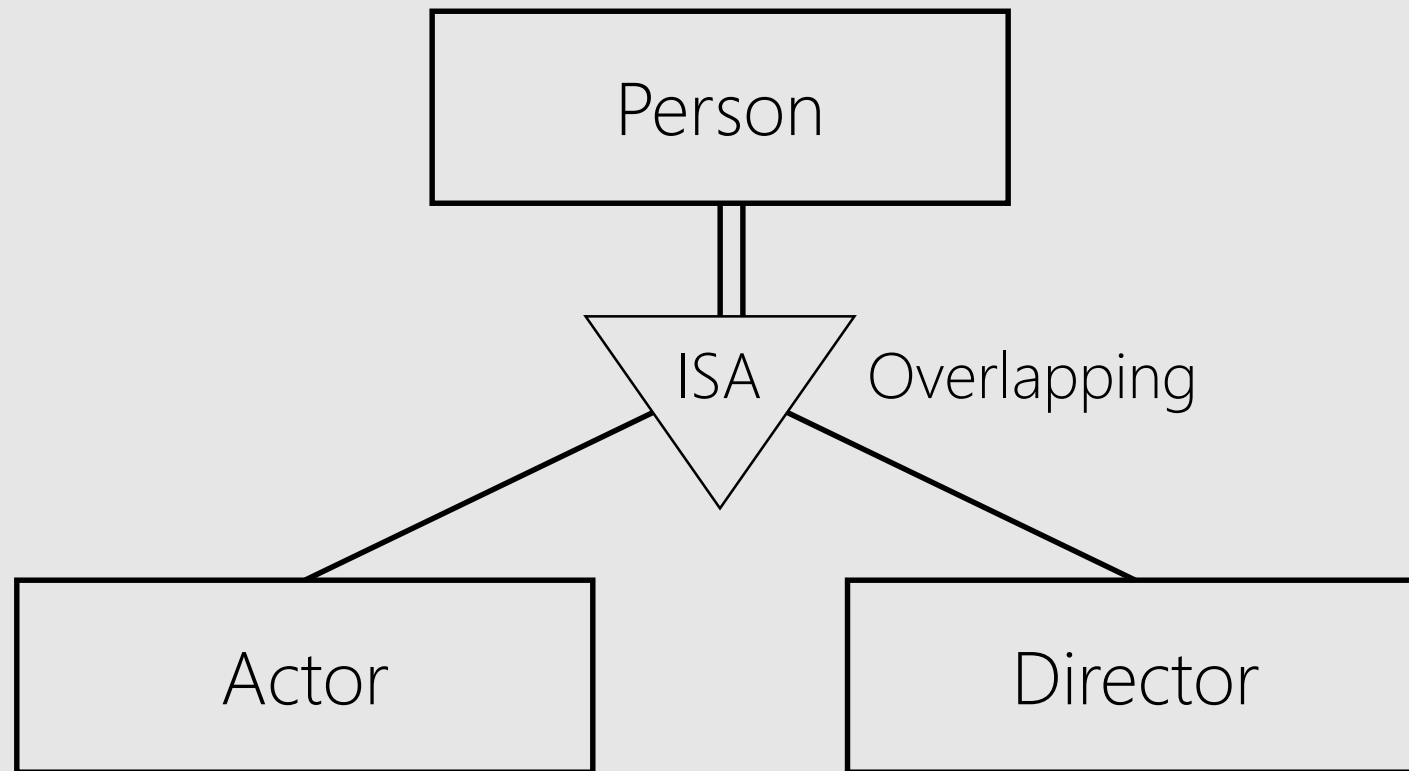
Disjoint Specification

An entity from parent entity set MUST be a member of only one child entity set

E/R × ISA × Total × Overlapping

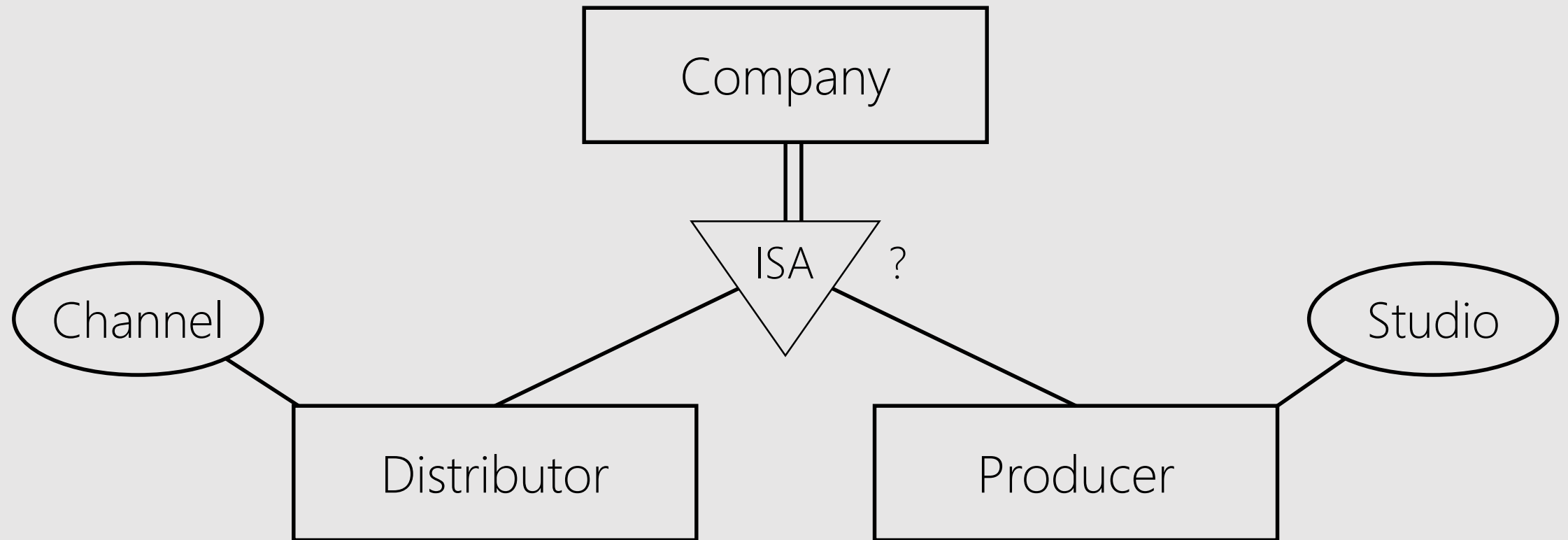
43

A Person entity might be both Actor and Director



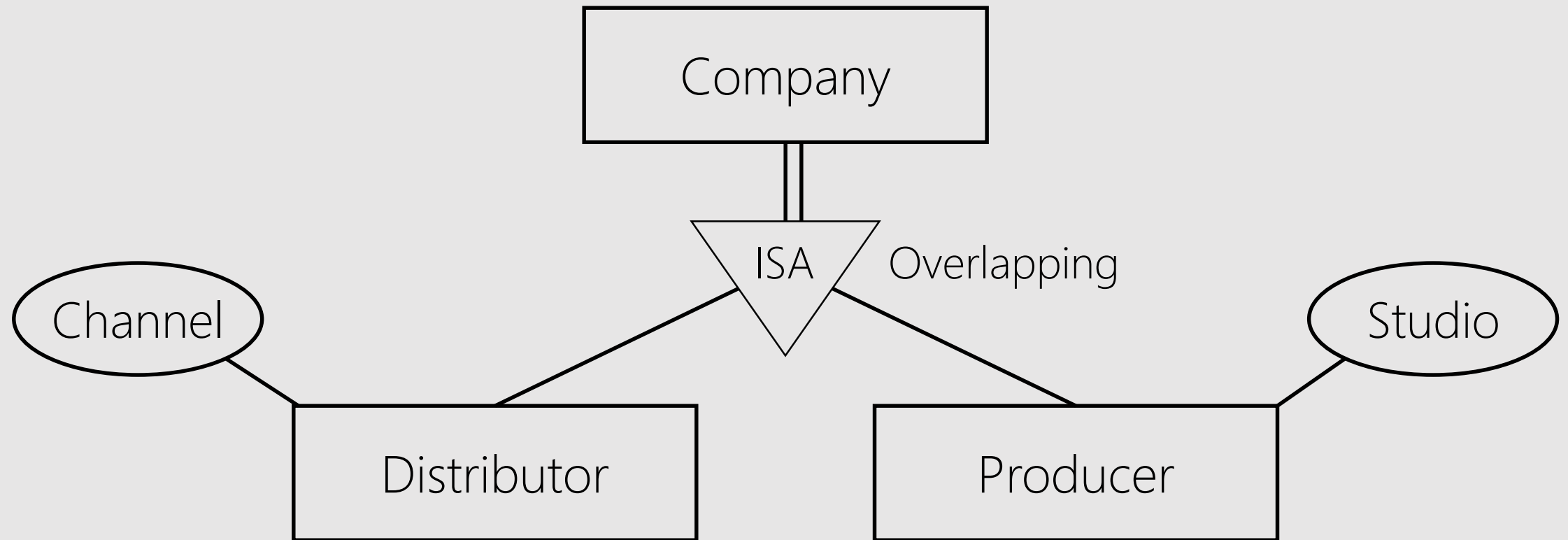
E/R × ISA × Total × ?

44



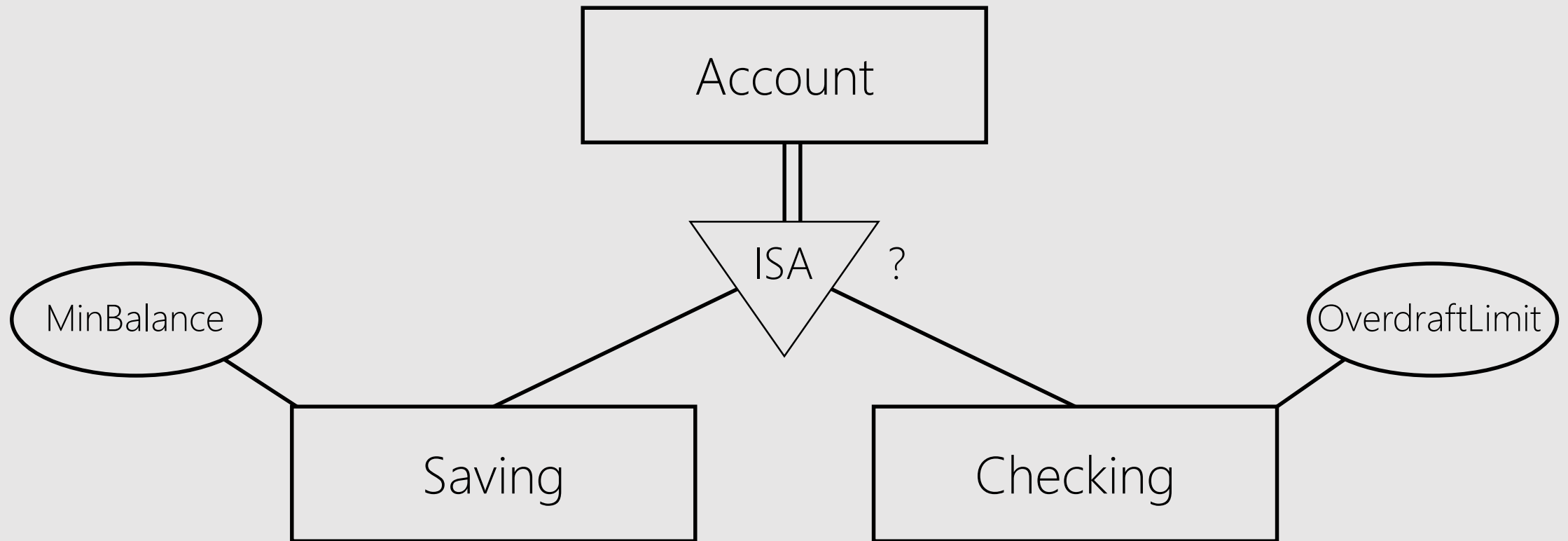
E/R × ISA × Total × Overlapping

45



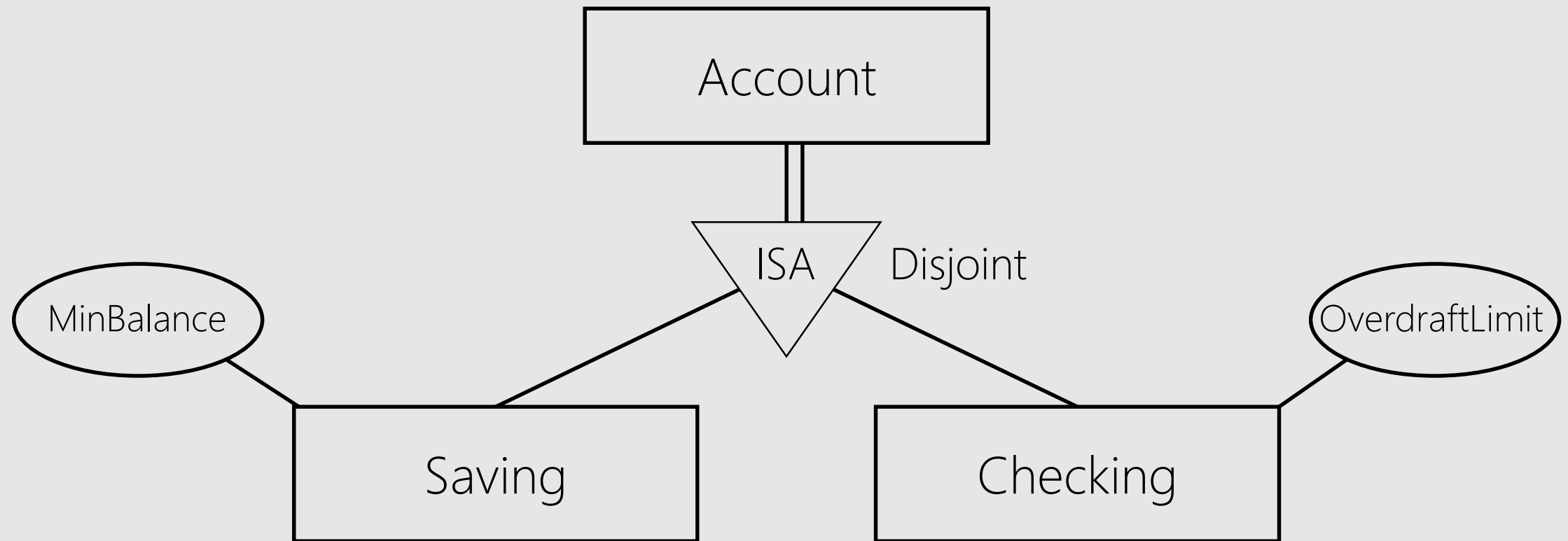
E/R × ISA × Total × ?

46



E/R × ISA × Total × Disjoint

47



E/R × ISA × Constraints

48

Total vs. Partial specification looks at parent participation

Overlapping vs Disjoint specification looks at children participation

E/R × ISA × Your System (10mins)

49



MR. HITCHCOCK