# Fundamentals of
# Database
# Systems

5th Edition

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# ERD Exercise

- Draw an ER schema diagram for keeping track of information about votes taken in the U.S. House of Representatives during the current two-year congressional session. The database needs to keep track of each CONGRESS_PERSON in the House of Representatives is described by his or her Social Security Number (SSN), Name, plus the state represented (e.g., 'Texas', 'New York', 'California'), the Start_date when the congressperson was first elected, and the political Party to which he or she belongs (whose domain is {'Republican', 'Democrat', 'Independent', 'Other'}).

- The database keeps track of each BILL (i.e., proposed law), including unique bill_identifier, the Bill_name, the Date_of_vote on the bill, and the Sponsor (the congressperson(s) who sponsored—that is, proposed—the bill). The database also keeps track of how each congressperson voted on each bill (domain of Vote attribute is {'Yes', 'No', 'Abstain', 'Absent'}). State clearly any assumptions you make.
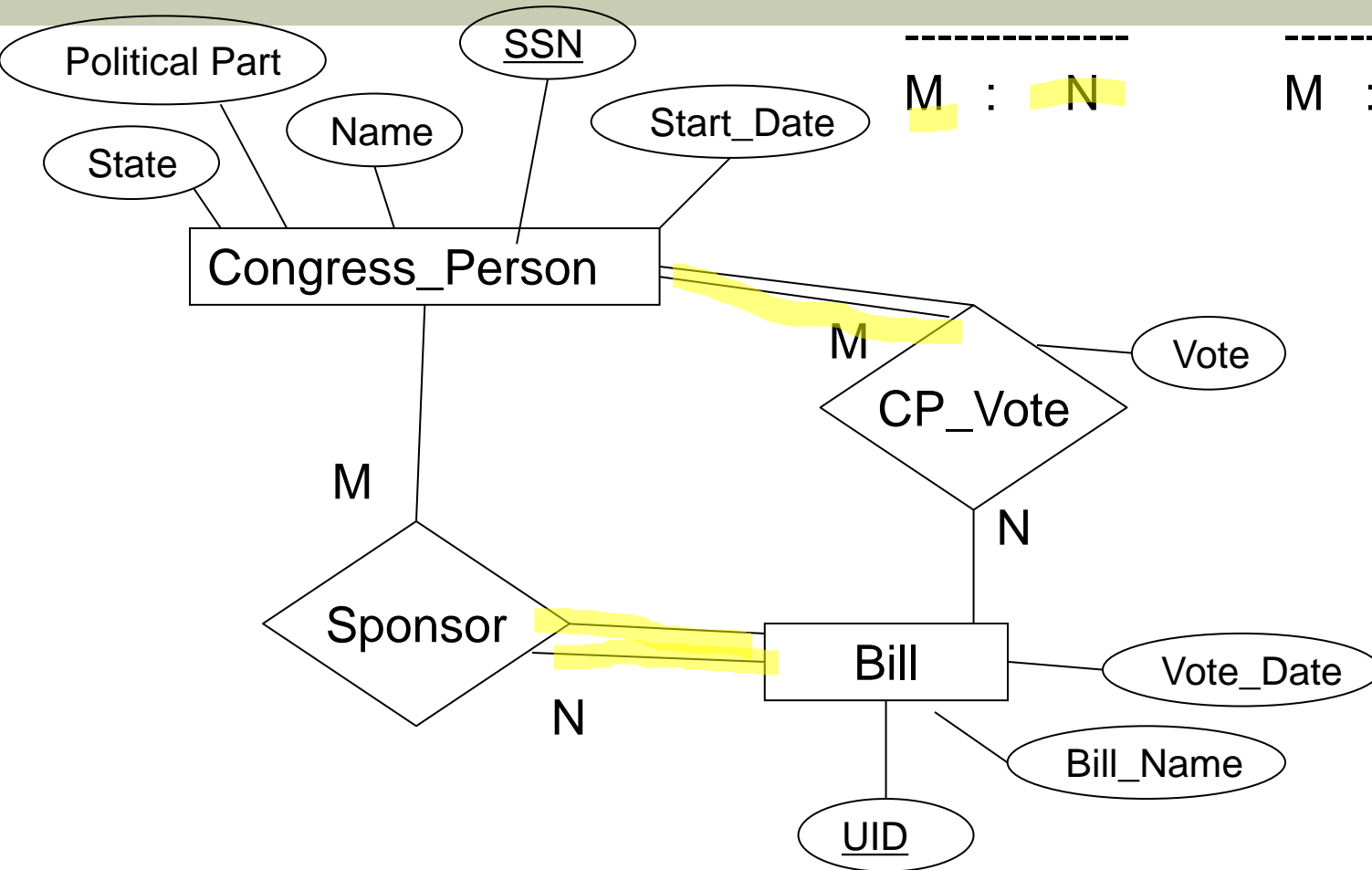
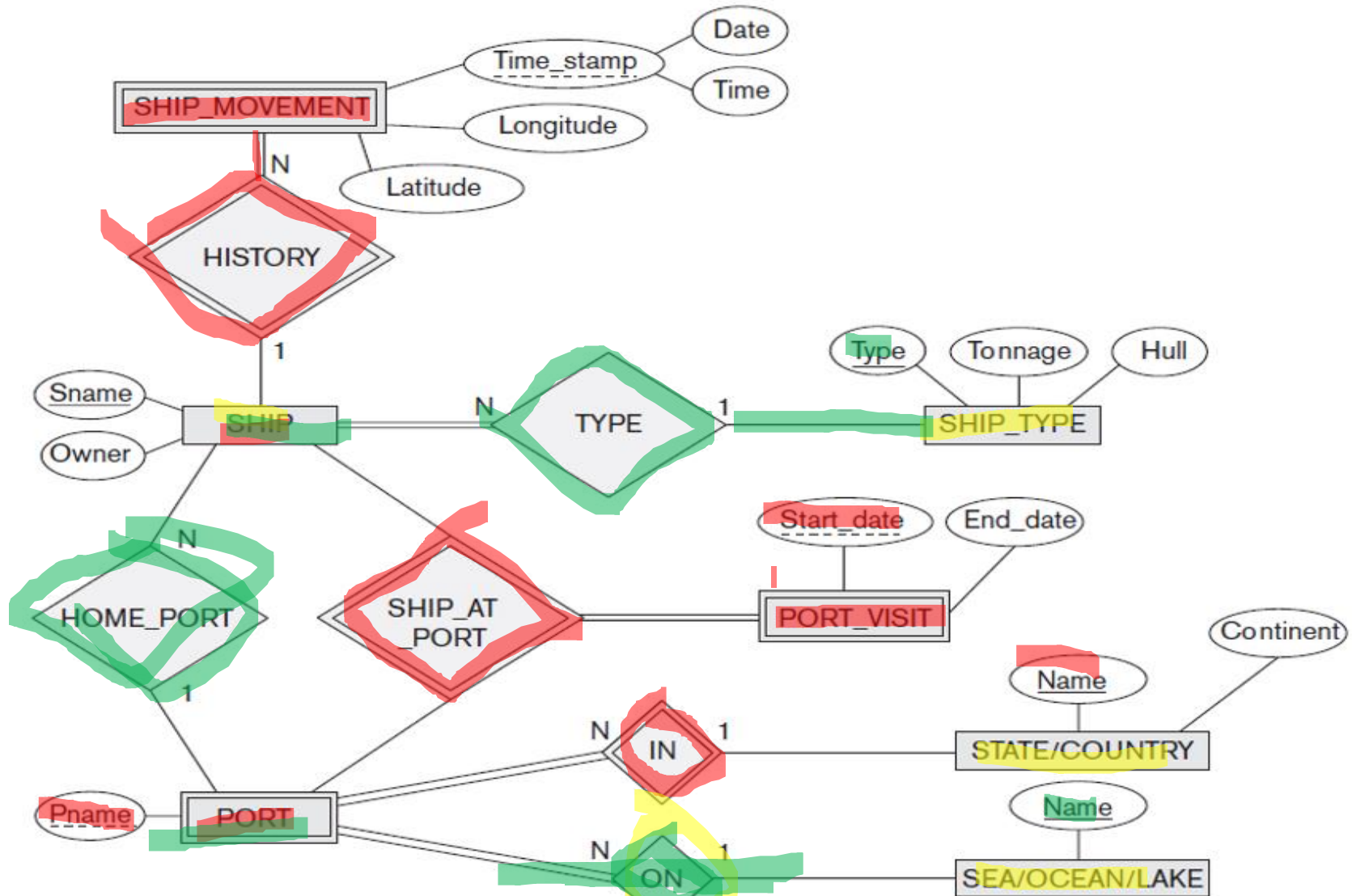|         | Sponsor |      |         | Vote |      |
|---------|---------|------|---------|------|------|
|         | CP      | Bill |         | CP   | Bill |
|         | 1       | M    |         | 1    | M    |
|         | M       | 1    |         | M    | 1    |
|         | ------------- |  |         | ------------- |  |
|         | M : N   |      |         | M : N |     |

Political Part

SSN

Name

Start_Date

State

Congress_Person

M

CP_Vote

Vote

N

M

Sponsor

N

Bill

Vote_Date

Bill_Name

UID

# Mapping to Schema Exercise

Ship

| Sname | Owner |
|-------|-------|

Ship_Type

| Type | Tonnage | Hull |
|------|---------|------|

State/Country

| Name | Continent |
|------|-----------|

Sea/Ocean/Lake

| Name |
|------|

Port_Visit

| StartDate | EndDate | Sname | Pname | StateName |
|-----------|---------|-------|-------|-----------|

Ship_Movement

| Date | Time | Longitude | Latitude | Sname |
|------|------|-----------|----------|-------|

Port

| Pname | StateName |
|-------|-----------|

## Ship

| Sname | Owner | Type | Pname | StateName |
|-------|-------|------|-------|-----------|

## Ship_Type

| Type | Tonnage | Hull |
|------|---------|------|

## State/Country

| Name | Continent |
|------|-----------|

## Sea/Ocean/Lake

| Name |
|------|

## Port_Visit

| StartDate | EndDate | Sname | Pname | StateName |
|-----------|---------|-------|-------|-----------|

## Ship_Movement

| Date | Time | Longitude | Latitude | Sname |
|------|------|-----------|----------|-------|

## Port

| Pname | StateName | SeaName |
|-------|-----------|---------|

# Normalization Exercise

BOOK (<u>Book_title, Author_name</u>, Book_type, price, Author_affil, Publisher)

- Author_affil refers to the affiliation of author. Suppose the following dependencies exist:
- Book_title → Publisher, Book_type
- Book_type → price
- Author_name → Author_affil
- 
- Apply normalization until you cannot decompose the relations further.
- ***State the reasons behind each decomposition.***

Book

| BookTitle | AuthorName | Type | Price | Publisher | Auth_Aff |
|-----------|------------|------|-------|-----------|----------|

Book

| BookTitle | Type | Price | Publisher |
|-----------|------|-------|-----------|

Author

| AuthorName | Auth_Aff |
|------------|----------|

BookAuthor

| BookTitle | AuthorName |
|-----------|------------|

Book

| BookTitle | Type | Publisher |
|-----------|------|-----------|

Book_Type

| Type | Price |
|------|-------|