ENSF 608 Fall 2021 – Lab 13

December 8, 2021
Dr. Emily Marasco

Recording Notice

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If a student turns on their microphone or camera, or uses the public chat feature, this constitutes consent for the student's video image or sound audio to be uploaded with a recording. If a student wishes to ensure that their questions/faces/voices are not recorded in the video, they should instead use the private chat feature to ask questions.

Goals for Today

- Quiz 2 solutions
- Assignment 5 reminders
- Upcoming survey
- Open Assignment 5/project/general work time

Quiz 2 Performance

- Fantastic work!
- Issue with one choice of one normalization question…

- Max: 100%
- Median: 90%
- Mean: 88%
- Mode: 90%
- Std Dev: 11.73%

SQL Queries

STUDENT

Name	Student_number	Class	Major
Smith	17	1	CS
Brown	8	2	CS

COURSE

Course_name	Course_number	Credit_hours	Department
Intro to Computer Science	CS1310	4	CS
Data Structures	CS3320	4	CS
Discrete Mathematics	MATH2410	3	MATH
Database	CS3380	3	CS

SECTION

Section_identifier	Course_number	Semester	Year	Instructor
85	MATH2410	Fall	07	King
92	CS1310	Fall	07	Anderson
102	CS3320	Spring	08	Knuth
112	MATH2410	Fall	08	Chang
119	CS1310	Fall	08	Anderson
135	CS3380	Fall	08	Stone

GRADE_REPORT

Student_number	Section_identifier	Grade
17	112	B
17	119	C
8	85	A
8	92	A
8	102	B
8	135	A

PREREQUISITE

Course_number	Prerequisite_number
CS3380	CS3320
CS3380	MATH2410
CS3320	CS1310

SQL Queries

Fill in the query to retrieve the names and majors of all students who received an A in any of their courses.

```
SELECT S.Name, S.Major FROM STUDENT AS S, GRADE_REPORT AS G WHERE
G.Student_number = S.Student_number AND G.Grade = ‘A’;
```

Fill in the query to delete the section taught by Dr. Anderson in 2007.

```
DELETE FROM SECTION WHERE Instructor = ‘Anderson’ AND Year = ‘07’;
```

The university has decided to no longer offer MATH2410. Which of the following tables will be impacted if MATH2410 is completely deleted from the database? Select all that are impacted.

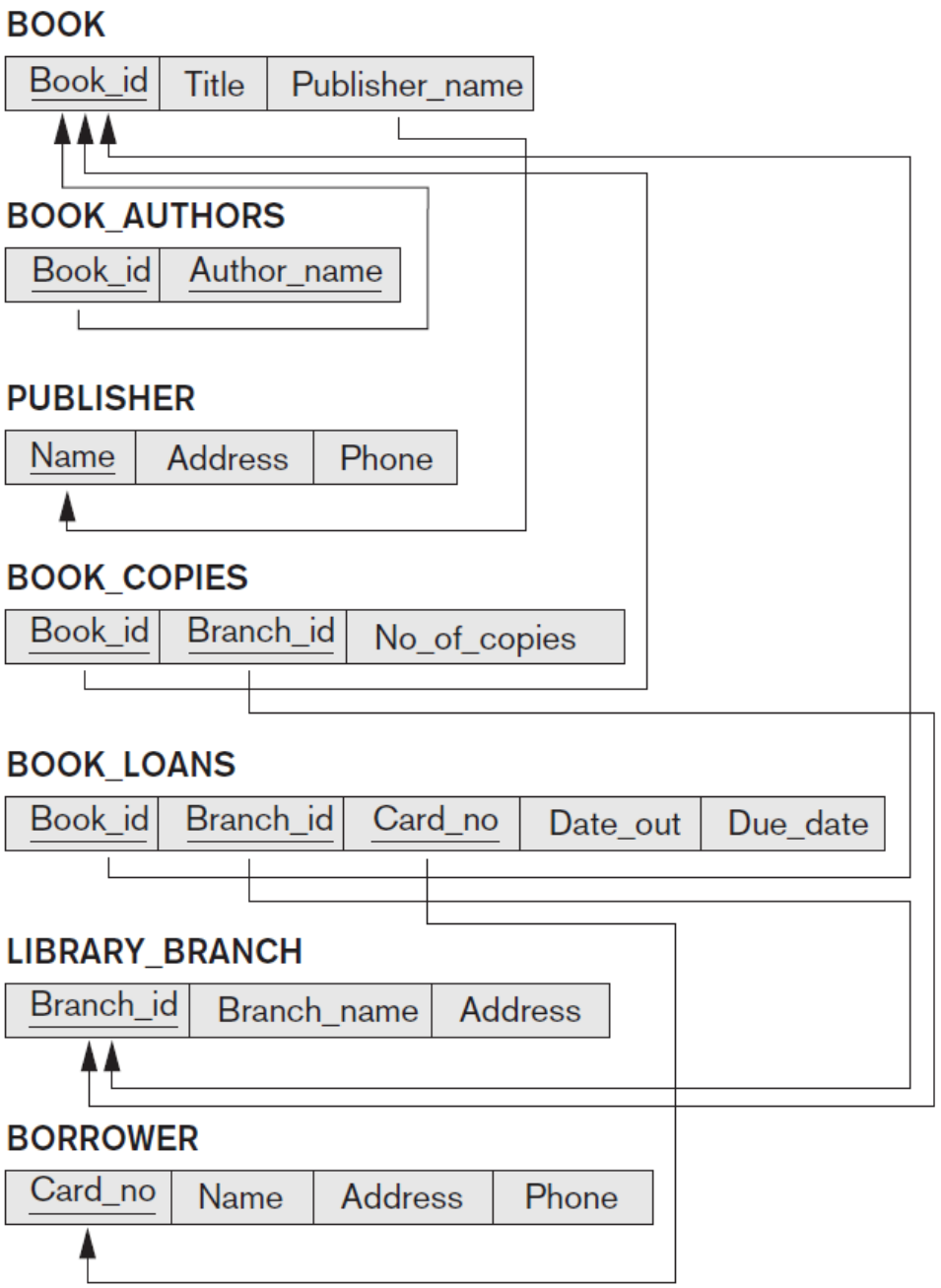
- [x] PREREQUISITE
- [x] COURSE
- [ ] STUDENT
- [x] SECTION

Which table could represent a recursive relationship?

- ( ) SECTION
- ( ) COURSE
- (•) PREREQUISITE
- ( ) GRADE_REPORT

Which of the following is not true about the database?

- "Grade" in GRADE_REPORT could represent a relationship attribute
- ➡ STUDENT and COURSE can be joined naturally
- COURSE and PREREQUISITE can be joined either naturally or with a specified join
- STUDENT and GRADE_REPORT can be joined naturally
- PREREQUISITE contains two references to COURSE



Retrieve the number of copies of the book titled "The Fellowship of the Ring" owned by each library branch.

- ➡ ◉ $\pi_{\text{Branch\_id, No\_of\_copies}}((\sigma_{\text{Title} = \text{“The Fellowship of the Ring”}} (\text{BOOK})) * \text{BOOK\_COPIES})$
- ○ $\sigma_{\text{Branch\_id, No\_of\_copies}}((\pi_{\text{Title} = \text{“The Fellowship of the Ring”}} (\text{BOOK})) * \text{BOOK\_COPIES})$
- ○ $\sigma_{\text{Branch\_id, No\_of\_copies, Title} = \text{“The Fellowship of the Ring”}} (\text{BOOK} * \text{BOOK\_COPIES})$
- ○ None of the above

Retrieve the names of all borrowers who do not currently have any books checked out.

- ○ $\pi_{\text{Name}}(\text{BORROWER} * (\sigma_{\text{Card\_no}} (\text{BORROWER}) - \sigma_{\text{Card\_no}} (\text{BOOK\_LOANS})))$
- ➡ ◉ $\pi_{\text{Name}}(\text{BORROWER} * (\pi_{\text{Card\_no}} (\text{BORROWER}) - \pi_{\text{Card\_no}} (\text{BOOK\_LOANS})))$
- ○ $\sigma_{\text{Name}}(\text{BORROWER} * (\pi_{\text{Card\_no}} (\text{BORROWER}) - \pi_{\text{Card\_no}} (\text{BOOK\_LOANS})))$
- ○ None of the above

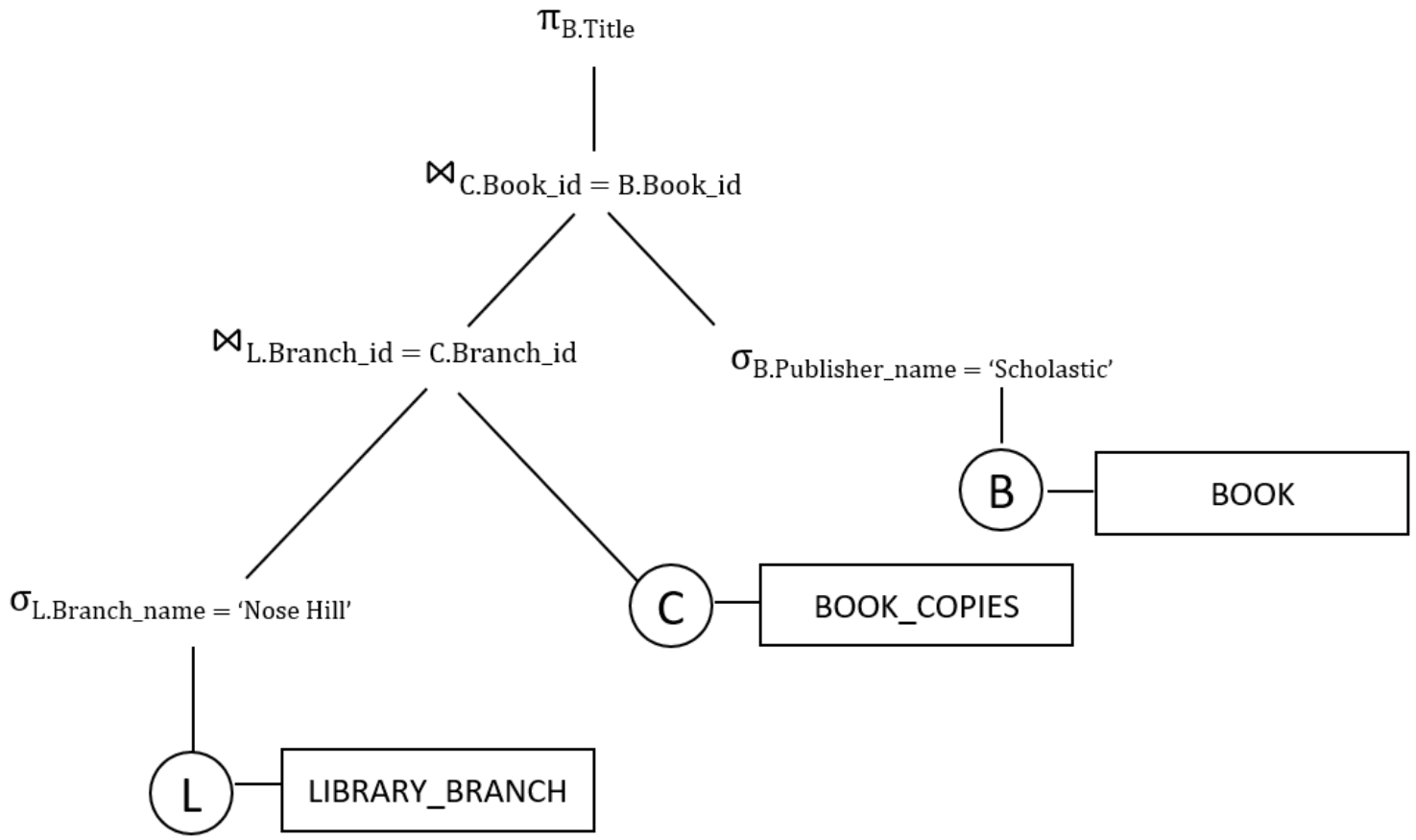
Retrieve the publisher's address for the book titled "Don Quixote".

- $\pi_{\text{Address}}((\sigma_{\text{Title} = \text{“Don Quixote”}} (\text{BOOK})) * \text{PUBLISHER})$
- ➡ $\pi_{\text{Address}}((\sigma_{\text{Title} = \text{“Don Quixote”}} (\text{BOOK})) \bowtie_{\text{Publisher\_name} = \text{Name}} \text{PUBLISHER})$
- $\sigma_{\text{Address}}((\sigma_{\text{Title} = \text{“Don Quixote”}} (\text{BOOK})) \bowtie \text{PUBLISHER})$
- None of the above

Retrieve the due date for the book titled "Black Beauty" signed out by the borrower named Eli Smith.

- $\pi_{\text{Due\_date}}(\pi_{\text{Book\_id}} \text{BOOK\_LOANS} * (\sigma_{\text{Name} = \text{“Eli Smith”}} (\text{BORROWER})))$
- $\pi_{\text{Due\_date}}(\text{BOOK\_LOANS} * (\sigma_{\text{Name} = \text{“Eli Smith”}} (\text{BORROWER}) * \sigma_{\text{Title} = \text{“Black Beauty”}} (\text{BOOK})))$
- $\sigma_{\text{Due\_date}}(\text{BOOK\_LOANS} * (\pi_{\text{Name}} (\text{BORROWER}) * \sigma_{\text{Title} = \text{“Black Beauty”}} (\text{BOOK})))$
- ➡ None of the above

A query tree is shown below. Based on the library schema provided above, what query does the tree represent?



- Retrieve the titles of all books published by Scholastic currently signed out from the Nose Hill library branch.
- Retrieve the titles of all books published by Scholastic not currently signed out from the Nose Hill library branch.
- ➡ Retrieve the titles of all books published by Scholastic owned by the Nose Hill library branch.
- None of the above

Functional Dependencies

A	B	C	D
a1	b1	c1	d1
a2	b2	c2	d2
a2	b2	c3	d3
a3	b3	c3	d4
a4	b4	c4	d5

For each X -> Y combination below, state whether it is true or false that X functionally determines Y.

TRUE:

B → A

D → A

D → C

FALSE:

A → D

C → A

C → B

Best choice for primary key = D

Normalization

SupplierID	SupplierLocation	Item	StoreID	StoreName	StoreLocation
1061	Mexico	Grapes	001	Co-op	Dalhousie
1823	Washington	Apples	001	Co-op	Dalhousie
1823	Washington	Cherries	002	Superstore	Edgemont
2157	British Columbia	Cherries	003	Safeway	Brentwood
2157	British Columbia	Apples	002	Superstore	Edgemont
2944	California	Grapes	003	Safeway	Brentwood
2944	California	Grapes	004	Co-op	Brentwood

Select all the reasons that this relation does not meet the requirements for 2nd normal form.

- [x] SupplierID is only dependent on part of the primary key
- [x] Supplier and Store should be separate entities
- [ ] Item is dependent on both attributes of the primary key
- [x] StoreName is only dependent on part of the primary key

Normalization

SupplierID	SupplierLocation	Item	StoreID	StoreName	StoreLocation
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2944	California	Grapes	004	Co-op	Brentwood

Based on the identified primary key, what assumption can you make about the cardinality?

- ➡ (●) Each store only sources a specific item from one supplier
- ( ) Each store only sources all items from one location
- ( ) Each supplier only supplies a specific item to one store
- ( ) All store locations have the same suppliers

Assignment 5 Reminders

- Industry video is available on D2L
- MUST be in your own words- watch for inadvertent academic misconduct
- IEEE references (#2 and #3)
- Full sentences except for Question #1

Engineering Education Survey

- Research study to support pedagogy in software engineering
- Completely optional, not related to either course
- Same survey link will be posted on ENSF 607 and 608 D2L sites
- Option to include project work in the study
- Best taken after completing the project

Final Deliverables

- Assignment 5 (6%) – Due last day of classes
- Joint ENSF 607/608 Project (30%) – Due last day of classes, dropbox open without penalty until 11:59 pm on December 14th

Thank you!

Developers: The user interface is very simple. No need to document it.

Users: