Constraints		UNIQUE also specifies no duplicates but PK is the best match for <i>uniquel</i> <i>identifies</i>
BOOK ( <u>Book id</u> , Title, Publisher_name) BOOK, AUTHORS ( <u>Book id</u> , <u>Author_name</u> ) FUBLISHER ( <u>Name</u> , <u>Address</u> , <u>Fhone</u> ) BOOK COPIES ( <u>Book id, Branch id</u> , No_of_copies) BOOK LOANS (Book id, <u>Branch id</u> , Card no, pate ou	t,Due date)	not taking space for unnecessary sign (unsigned) is better than adding another check to perform (CHECK constraint)
LIBRARY BRANCH (Branch id, Branch name, Address BORROWER ( <u>Card no</u> , Name, Address, Phone)		not FK – foreign key references a specific row in another table
The name uniquely identifies publishers.	primary key constr	not i k = bonower wante and i none
By default, the number of copies of a book at a branch is 1.	DEFAULT	are only attributes of BORROWER – no reference to another table not "can't be enforced" – ER
The number of copies can't be negative.	unsigned	diagrams, relational schemas don't
The due date cannot be before the date the book was checked out.	CHECK constraint	have a notation for additional keys but this info can be stated separatel
The combination of name and phone number also uniquely identify particular borrowers.	UNIQUE	not column data type – can't be mor specific than CHAR(10) or CHAR(12)
Phone numbers must be of the form XXX-XXX- XXXX.	CHECK constraint	prefer FK to triggers when possible (borrowers are in BORROWERS and are referenced in BOOK LOANS)
Only borrowers that are in the database can check out books.	foreign key constra	
By default, books are due two weeks after they are checked out.	trigger DEFAULT	expressions are allowed for DEFAUL in MySQL 8+
CPSC 343: Database Theory and Practice • Fall 2024		prior to MySQL 8+ allowed only constant literals and CURRENT_TIMESTAMP

## **CHECK** Constraints

ALTER TABLE table ADD CONSTRAINT name CHECK (condition);

ALTER TABLE table DROP CONSTRAINT name;

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## Constraints

BOOK ( <u>Book id</u> ,Title,Publisher_name) BOOK AJTHORS ( <u>Book id</u> ,Author_name) PUBLISHE ( <u>Mass</u> ,Address, Fhone) BOOK_COPIES ( <u>Book id</u> , <u>Branch id</u> ,Mo_of_copies) BOOK_LOANS ( <u>Book id</u> , <u>Branch id</u> , <u>Afcard</u> , <u>na</u> ,Date_out,Due_date) LIBEARY BANKH ( <u>Branch id</u> , <u>Branch</u> , <u>mas</u> ,Address) BORROWER ( <u>Card no</u> ,Name,Address,Phone)	but it is primar identifying row DEFAULT allow CURDATE() for not FK – there's
A book's title is required. NOT NULL	<ul> <li>with valid date</li> <li>"default value"</li> <li>happens when</li> <li>include Date_o</li> <li>CHAR/VARCHA</li> <li>not exact) mat</li> <li>data type</li> <li>CHECK constra</li> <li>specify regex)</li> <li>not CHECK con</li> <li>constraints car</li> <li>single row (and</li> </ul>
By default, the check out date for a book is the DEFAULT date on which the BOOK_LOANS entry is recorded.	
The card number is an alphanumeric string (can column data type contain letters and digits).	
A particular borrower can't have more than 5 trigger books checked out at a time.	
A borrower can't check out more than two books trigger on the same day.	
A book must have at least one author recorded.	
can't be enforced – the constraint itself creates a circular dependency with the FK in BOOK_AUTHOR; while a trigger can insert an author when a book is inserted, what name should be used?	not NOT NULL - that an entry ir entry in BOOK_ BOOK_AUTHOR BOOK.Book_id direction

## not PK – PK does imply NOT NULL, but it is primarily about uniquely identifying rows

DEFAULT allows functions like CURDATE() for MySQL 8+

not FK – there's not another table with valid dates for Date\_out; "default value" is about what happens when an INSERT doesn't include Date\_out

CHAR/VARCHAR is the best (but not exact) match for the column data type

CHECK constraint is also valid (can specify regex)

not CHECK constraint – CHECK constraints can only involve a single row (and no subqueries)

not NOT NULL – the constraint says that an entry in BOOK requires an entry in BOOK\_AUTHOR; the FK BOOK\_AUTHORS.Book\_id  $\rightarrow$  BOOK\_BOok\_id goes in the wrong direction

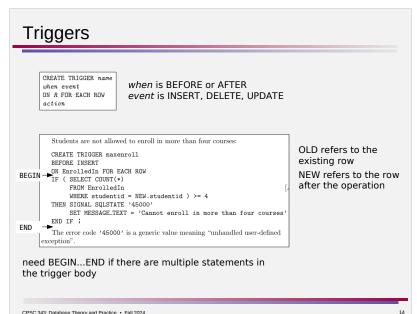
## Questions

When should you use a trigger instead of a CHECK (UNIQUE, NOT NULL, or other) constraint?

- use a trigger when other mechanisms are insufficient
  - e.g. a CHECK constraint cannot involve a subquery
  - prefer other mechanisms because a trigger is only run on an INSERT, UPDATE, DELETE operation
- a trigger can also be used to perform other bookkeeping

   not limited to checking constraints

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