

Solutions

Each answer shows the steps, then the **result**.

2.1

- wasted storage
- inconsistency: one copy is updated and another is not

2.2

- primary key `loan_id`
- foreign keys `student_id` and `book_id`

2.3

- (i) **one-to-one**
- (ii) **one-to-many**
- (iii) **many-to-many**

2.4

- it may start with 0 or contain + or spaces, which an integer would lose
- it is never used in calculations

3.1 B

- it links to another table

3.2 B

- no transitive dependency

3.3 B

- a link table

3.4

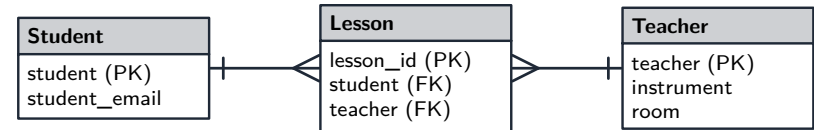
(a)

- Ivy's e-mail stored twice
- Wong's instrument and room stored twice

(b)

- Student(**student**, student_email)
- Teacher(**teacher**, instrument, room)
- Lesson(**lesson_id**, student, teacher)
- foreign keys **student** and **teacher** in Lesson correctly link the tables

(c)



- three entities: Student, Lesson, Teacher
- Student one-to-many Lesson
- Teacher one-to-many Lesson

(d)

- every **student** and **teacher** in Lesson must exist in the Student and Teacher tables
- a lesson cannot refer to a student who does not exist, and a teacher with lessons cannot be deleted without dealing with them