

Q 2)

a.) Normalization has the advantage of reducing data redundancy and enhancing data integrity, which makes it simpler to maintain and update the database. We can lessen data anomalies, enhance data consistency, and save storage space by splitting huge tables into smaller ones and deleting redundant data. Normalization has a disadvantage in that it necessitates joining many tables in order to get data, which can possibly slow down query execution.

b.)

Student ID	Student Name	Book Title	Author	Hours Read
A	Alice	Tom Sawyer	Mark Twain	10
B	Bob	Tom Sawyer	Mark Twain	12
C	Cindy	Tom Sawyer	Mark Twain	8
D	Dave	Treasure Island	Robert Louis Stevenson	9

The Book Title and Author columns in this table contain duplicate information, which may cause data anomalies if the same book is spelled differently or if the author's name is misspelled. Also, the teacher will need to alter numerous rows if they want to modify the book's title or author, which can be time-consuming and error-prone.

A better table shall be:

Student ID	Student Name	Book ID	Hours Read
A	Alice	1	10
B	Bob	1	12
C	Cindy	1	8
D	Dave	2	9

Book ID	Book Title	Author
1	Tom Sawyer	Mark Twain
2	Treasure Island	Robert Louis Stevenson

According to this approach, each book is given a distinct ID that serves as a foreign key in the student table. The book information is kept in a separate database. This gets rid of unnecessary information and makes it simple to update the material in the book without impacting the student data.