

Normal Forms Worksheet (Part 1)

Part A: Locating Dependencies

Here is a sample table with redundancies. Primary key is the combination key of (StudentNo, CourseNo). This table is already in First Normal Form because it has no duplicate rows, but it is not a good table. **Assume all non-F grades are passing.**

Student_Grade_Report

StudentNo*	StudentName	Course No*	CourseName	Grade	Passing
777777	Madison Milroy	CS3140	Database	B	TRUE
123456	Andy Adams	CS3140	Database	A	TRUE
777777	Madison Milroy	CS3730	Networking	F	FALSE

Fill in the following about the redundancies:

What columns depend on what columns	Write this out in relates form ($A \rightarrow B$)

Part B: Converting to Second Normal Form

A table is in **second normal form** when all non-key columns depend on the whole primary key. In other words, a non-key column cannot depend on part of a composite primary key.

Student_Grade_Report

StudentNo*	StudentName	Course No*	CourseName	Grade	Passing
777777	Madison Milroy	CS3140	Database	B	TRUE
123456	Andy Adams	CS3140	Database	A	TRUE
777777	Madison Milroy	CS3730	Networking	F	FALSE

(1) Which dependencies identified earlier depend on **only part** of the composite primary key?

(2) Remove those columns (scratch them out) in the table above and create new tables to eliminate the redundancy from (1)

Part C: Converting to Third Normal Form

Redundancy can occur in a second normal form table when a non-key column depends on another non-key column. Informally, a table is in third normal form when all non-key columns depend on the key, the whole key, and nothing but the key.

Student_Grade_Report

StudentNo*	Course No*	Grade	Passing
777777	CS3140	B	TRUE
123456	CS3140	A	TRUE
777777	CS3730	F	FALSE

Student_Name

StudentNo*	StudentName
777777	Madison Milroy
123456	Andy Adams

Course_Name

CourseNo*	CourseName
CS3140	Database
CS3730	Networking

(1) Which dependencies identified earlier depend **on no part** of the composite primary key in Student_Grade_Report? Hint: **Assume all non-F grades are passing.**

(2) Remove those columns (scratch them out) in the table above and create a new table to eliminate the redundancy from (1)