

COMP 3005 Fall 2025

Assignment 3

Question 2

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Enrollments(StudentID, CourseID, StudentName, CourseName, Instructor, Semester, Grade)

a)

Firstly, we identify the partial dependencies as:

StudentID -> StudentName

Since StudentName is only dependent on StudentID, and not CourseID.

CourseID -> CourseName

Since CourseName is only dependent on CourseID, and not StudentID.

and by extension

CourseName -> Instructor

Which again is only dependent on (CourseID -> CourseName), and not StudentID.

From this, we can decompose into two relations to achieve second normal form:

Courses(CourseID, CourseName, Instructor)

Enrollments(StudentID, CourseID, StudentName, Semester, Grade)

b)

We now have no transitive dependencies in the Courses relation; however, we do have one in the Enrollments relation:

(StudentID, CourseID) → StudentName

StudentName is only dependent on StudentID, not the composite key **(StudentID, CourseID)**.

From this, we can decompose the Enrollments relation into two relations to achieve third normal form:

Students(StudentID, StudentName)

Courses(CourseID, CourseName, Instructor)

Enrollments(StudentID, CourseID, Semester, Grade)