

# Database Normalization

## Functional dependencies

- 1)  $class\_no \rightarrow course\_name, section\_no, semester, year, \underline{instructorID}$
- 2)  $instructor\_id \rightarrow fname, lname$
- 3)  $studentID, class\_no \rightarrow evaluates$
- 4)  $questronID \rightarrow questron, typeID, options$
- 5)  $studentID, questronID, class\_no \rightarrow response$

Required:  $\{class\_no, studentID, questronID\}$



# Database Normalization

R (class\_no, course\_name, section\_no, semester, year, instructorID, frame, lname, studentID, evaluates, questionID, question, typeID, options, response)

— Split on class\_no → course\_name, section\_no, semester, year, instructorID

R1 (class\_no, course\_name, section\_no, semester, year, instructorID, frame, lname)

R2 (class\_no, studentID, evaluates, questionID, question, typeID, options, response)

— Split R1 on instructorID → frame, lname

- R11 (class\_no, course\_name, section\_no, semester, year, instructorID)
- R12 (instructorID, frame, lname)

— Split R2 on studentID, class\_no → evaluates

R21 (class\_no, studentID, questionID, question, typeID, options, response)

- R22 (class\_no, studentID, evaluates)

— Split R21 on questionID → question, typeID, options

- R211 (class\_no, studentID, questionID, response)
- R212 (questionID, question, typeID, options)



R21(class\_no, course\_name, section\_no, semester,  
year, instructorID)

R12(instructorID, fname, lname)

R22(class\_no, studentID, evaluates)

R211(class\_no, studentID, questionID, response)

R212(questionID, question, typeID, options)

The two tables, "student" and "classQuestions" are created as a database utility standpoint.

If we wanted to add attributes to student, then this allows us to add it to the student table.

The "classQuestions" provides us an easier way of accessing the template for questions asked by a class. In addition to this, if no evaluation has been filled for a class, R211 will not have that class\_no in it. Thus, we would have no way of seeing the questions a class wants to use.