Problem Set 1: 3NF

Consider a relation R with five attributes ABCDE. Dependencies of R is: A → B, BC → E, and ED → A?

1. Is R in 3NF?

Answer:-

No R is not in 3NF as there exists transitive dependency for A->B->E->A

1. Apply 3rd Normalization for the above 2nd problem?

Answer:-

Student (Student\_Id, LastName,First Name,Grade)

Course (Studentno, course\_no, course\_name,instructor\_no)

CourseInstructor (course\_no, course\_name,instructor\_no,instructor\_name, instructor\_location)

1. Apply 3rd Normalization for the above 3rd problem?

Answer:-

Employee(EmployeeNumber,EmployeeName,JobClass)

Project(ProjNum,ProjectName,EmployeeNumber )

Charge (ProjNum,EmployeeNumber,ChgHour,HoursBilled,TotalCharge)

1. Apply 3rd Normalization for the above 4th problem?

Answer:-

Student (Studentno, student\_name, major)

Course\_Grade (Studentno, course\_no, grade)

Course (Course\_no,course\_name,instructor\_no)

Instructor (Instructor\_no, instructor\_name, instructor\_location)

Problem Set 2: BCNF

Consider the relation schema R (A,B,C), which has the FD B → C.

1. If A is a candidate key for R, is it possible for R to be in BCNF?

Answer:-

No it is not possible for R to be in BCNF .

1. If so, under what conditions? If not, explain why not.

Answer:-

as only A is the candidate key and for a relation to be in BCNF all the determinants should be candidate keys.

1. Apply BCNF for the above 2nd problem?

Answer:-

Student (Student\_Id, LastName,First Name,Grade)

Course (Studentno, course\_no, course\_name,instructor\_no)

Instructor (course\_no, instructor\_no,instructor\_name, instructor\_location)

1. Apply BCNF for the above 3rd problem?

Answer:-

Employee(EmployeeNumber,EmployeeName,JobClass)

Project(ProjNum,ProjectName,EmployeeNumber )

Charge (ProjNum,EmployeeNumber,ChgHour,HoursBilled,TotalCharge)

1. Apply BCNF for the above 4th problem?

Answer:-

StudentNo-Name (Studentno, student\_namemajor)

Course\_Grade (Studentno, course\_no, grade)

Course (Course\_no,course\_name,instructor\_no)

Instructor (Instructor\_no, instructor\_name, instructor\_location)