Normalization Workshop

1. Given the following relation:

**Student {Student Name (PK), Major, Course#1, ClassTime1, Location1, Course#2, ClassTime2, Location2, Course#3, ClassTime3, Location3}**



Provide an analysis relating to the following concepts:

1. 1st Normal Form – Relation is not in first normal form due to repeated attributes related to Courses

Student {Student Name,Major}

Course {Course#,ClassTime,Location}



1. 2nd Normal Form – Relation is in second normal form because there is a single-valued key (Student Name)

No Change

1. 3rd Normal Form – Relation is not in third normal form because the course info is not dependent on the key (Student Name) but on the Course#

Student {Student Name,Major}

Courses {Course#,ClassTime,Location}

Student-Courses {Student Name,Course#}



1. Choice of Primary Key

Student Name is not unique, Student Name,Major is not unique.

Course# is a surrogate key. There is no candidate key in the Courses relation.

1. If you were to fix this relation, what would you do and why (consider everything you have learned this semester)

Add more attributes to the Student Scheme to create a proper candidate key (perhaps email).

After there is a candidate key, generate a surrogate key (StudentID)

Alter, the Student-Courses scheme to use StudentID as a foreign instead of Student Name)

Add more attribute to the Courses scheme to make a valid candidate key (perhaps CourseName). Need definition of ClassTime. If CourseName, ClassTime and Location make a CK, Course# is a valid surrogate key.