**- Additional Normalization Problem to Solve**

This single relation contains all the attributes of our database.

Coursera (

EmailAddress, StudentName, BirthDate, Location, StudentGender,

CourseId, CourseName, Overview, Duration, Difficulty, Category, FAQ,

UniversityId, UniversityName, Description,

InstructorId, InstructorName, InstructorGender, Specialization,

TransactionId, TimeStamp, TransactionStatus,

CreditCardNo, NameOnCard, CVV, ExpiryDate,

RateStars, Comments

)

These are the functional dependencies that are present in the above relation.

Email Address -> StudentName, BirthDate, Location, StudentGender

CourseId -> CourseName, Overview, Duration, Difficulty, Category, FAQ

UniversityId -> UniversityName, Description

InstructorId -> InstructorName, InstructorGender, Specialization

TransactionId -> Timestamp, TransactionStatus

CreditCardNo -> NameOnCard, CVV, ExpiryDate

CourseId -> EmailAddress, UniversityId, InstructorId, TransactionId, CreditCardNo

To do a 3NF decomposition, we simply take each FD and make it into its own relation. We would need one more relation if the primary key was not contained anywhere. In this case, the primary key is just CourseId, so no additional relations are required.

R1(Email Address, StudentName, BirthDate, Location, StudentGender)

R2(CourseId -> CourseName, Overview, Duration, Difficulty, Category, FAQ)

R3(UniversityId, UniversityName, Description)

R4(InstructorId -> InstructorName, InstructorGender, Specialization)

R5(TransactionId, Timestamp, TransactionStatus)

R6(CreditCardNo, NameOnCard, CVV, ExpiryDate)

R7(CourseId, EmailAddress, UniversityId, InstructorId, TransactionId, CreditCardNo)