HKU Business School
MSBA7024 Database Design and Management
Exercise 3 Answer

1. (a) Determine the functional dependencies in the following relation:

   - Course(CourseID, CourseName, InstructorID, InstructorName, Semester, NumEnrolment)

Ans: CourseID → CourseName
CourseID, Semester → InstructorID, InstructorName, NumEnrolment
InstructorID → InstructorName

(b) Convert the relation into 2NF (but not 3NF).

Ans: Course(CourseID, CourseName)
CourseSection(CourseID, Semester, InstructorID, InstructorName, NumEnrolment)

(c) Convert the relation into 3NF.

Ans: Course(CourseID, CourseName)
CourseSection(CourseID, Semester, InstructorID, NumEnrolment)
Instructor(InstructorID, InstructorName)

2. (a) Determine the functional dependencies in the following relations:

- Order(OrderID, OrderDate, CustomerID, CustomerName, CustomerAddress)
- Product(ProductID, ProductDescription, ProductPrice)
- OrderLine(OrderID, ProductID, OrderQuantity)

Ans: OrderID → OrderDate, CustomerID, CustomerName, CustomerAddress
CustomerID → CustomerName, CustomerAddress
ProductID → ProductDescription, ProductPrice
OrderID, ProductID → OrderQuantity

(b) Is this in 1NF, 2NF, or 3NF? Please explain your answer.

Ans: 2NF, because there is no partial dependency but there is transitive dependency in the first relation: OrderID → CustomerID → CustomerName, CustomerAddress

(c) Convert the relations into 3NF.

Ans: - Order(OrderID, OrderDate, CustomerID)
- Customer(CustomerID, CustomerName, CustomerAddress)
- Product(ProductID, ProductDescription, ProductPrice)
- OrderLine(OrderID, ProductID, OrderQuantity)