# **2309318 – Lab 6**

**Part 1: Question 1**

a. Identify and discuss each of the indicated dependencies

1. ISBN, Author\_Num → BookTitle = functional dependency.
2. ISBN, Author\_Num → LastName = functional dependency.
3. ISBN, Author\_Num → Publisher = functional dependency.
4. ISBN, Author\_Num → Royalty = functional dependency.
5. ISBN, Author\_Num → Edition = functional dependency.
6. ISBN → BookTitle = partial dependency.
7. ISBN → Publisher = partial dependency.
8. ISBN → Edition = partial dependency.
9. Author\_Num → LastName = partial dependency.
10. BookTitle → Publisher = transitive dependency.

b. Create a database whose tables are at least in 2NF, identify all the dependencies that exist in the tables. Also show the dependency diagrams for each table.

**Table 1**

ISBN

Author\_Num

Royalty

**Primary Key = ISBN, Foreign Key = None, Normal Form = 2NF**

ISBN

BookTitle

Publisher

Edition

**Table 2**

**Primary Key = Author\_Num, Foreign Key = None, Normal Form = 3NF**

**Table 3**

**Primary Key = ISBN and Author\_Num, Foreign Key = ISBN (Table 1) and Author\_Num(Table 2), Normal Form = 3NF**

Author\_Num

LastName

c. Create a database whose tables are at least in 3NF, identify all the dependencies that exist in the tables. Also show the dependency diagrams for each table. The normalisation results are shown in Figure 1c.

**Table 1**

**Primary Key = ISBN, Foreign Key = None, Normal Form = 3NF**

|  |  |  |
| --- | --- | --- |
| ISBN | BookTitle | Edition |

**Table 2**

**Primary Key = ISBN and Author\_Num, Foreign Key = ISBN (Table 1) and Author\_Num(Table 2),**

**Normal Form = 3NF**

ISBN

Author\_Num

Royalty

**Table 3**

**Primary Key = Author\_Num, Foreign Key = None, Normal Form = 3NF**

Author\_Num

LastName

**Table 4**

**Primary Key = BookTitle, Foreign Key = None, Normal Form = 3NF**

BookTitle

Publisher

**Question 2**

a.

STU\_

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HOU

RS

STU\_

CLA

SS

**Relational schema:**

2NF (STU\_NUM, STU\_LNAME, STU\_MAJOR, DEPT\_CODE, DEPT\_NAME,

DEPT\_PHONE, COLLEGE\_NAME, ADVISOR\_LNAME, ADVISOR\_OFFICE, ADVISOR\_BLDG,ADVISOR\_PHONE, STU\_GPA, STU\_HOURS, STU\_CLASS)

**Dependencies:**

STU\_NUM → STU\_LNAME, STU\_MAJOR, DEPT\_CODE, DEPT\_NAME, DEPT\_PHONE,

COLLEGE\_NAME, ADVISOR\_LNAME, ADVISOR\_OFFICE, ADVISOR\_BLDG,

ADVISOR\_PHONE, STU\_GPA, STU\_HOURS, STU\_CLASS = functional dependency

DEPT\_CODE → DEPT\_NAME, DEPT\_PHONE,COLLEGE \_NAME = transitive dependency

ADVISOR\_OFFICE → ADVISOR\_BLDG, ADVISOR\_PHONE, ADVISOR\_LNAME,

DEPT\_CODE, DEPT\_NAME, DEPT\_PHONE, COLLEGE

\_NAME = transitive dependency

b.

**Table 1**

**Primary Key = STU\_NUM. Foreign Keys = ADVISOR\_NUM(Table 3) and DEPT\_CODE(Table 2), Normal Form = 3NF**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| STU\_  NUM | STU\_ LNAME | STU\_ MAJOR | DEPT\_COD E | ADVISOR \_NUM | STU\_ GPA | STU\_ HOURS | STU\_ CLASS |

**Table 2**

**Primary Key = DEPT\_CODE, Foreign Key = None, Normal Form = 3NF**

|  |  |  |  |
| --- | --- | --- | --- |
| DEPT\_CODE | DEPT\_NAME | DEPT\_PHONE | COLLEGE\_NAME |

**Table 3:**

**Primary Key = ADVISOR\_NUM, Foreign Key = DEPT\_CODE(Table 2), Normal Form = 3NF**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ADVISOR\_NUM | DEPT\_CODE | ADVISOR\_BLGD | ADVISOR\_PHONE | ADVISOR\_OFFICE |