

2309318 – Lab 6

Part 1: Question 1

a. Identify and discuss each of the indicated dependencies

1. ISBN, Author_Num \rightarrow BookTitle = functional dependency.
2. ISBN, Author_Num \rightarrow LastName = functional dependency.
3. ISBN, Author_Num \rightarrow Publisher = functional dependency.
4. ISBN, Author_Num \rightarrow Royalty = functional dependency.
5. ISBN, Author_Num \rightarrow Edition = functional dependency.
6. ISBN \rightarrow BookTitle = partial dependency.
7. ISBN \rightarrow Publisher = partial dependency.
8. ISBN \rightarrow Edition = partial dependency.
9. Author_Num \rightarrow LastName = partial dependency.
10. BookTitle \rightarrow 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

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

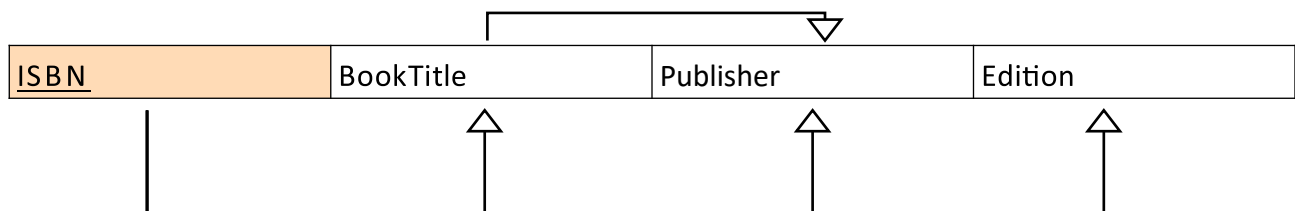


Table 2

Primary Key = Author_Num, Foreign Key = None, Normal Form = 3NF

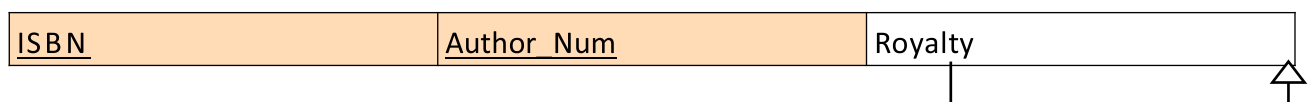
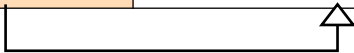


Table 3

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

<u>Author_Num</u>	LastName
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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

<u>ISBN</u>	BookTitle	Edition
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Table 2

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

<u>ISBN</u>	<u>Author_Num</u>	Royalty
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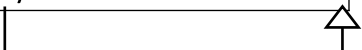


Table 3

Primary Key = Author_Num, Foreign Key = None, Normal Form = 3NF

<u>Author_Num</u>	LastName
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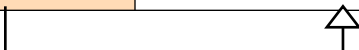



Table 4

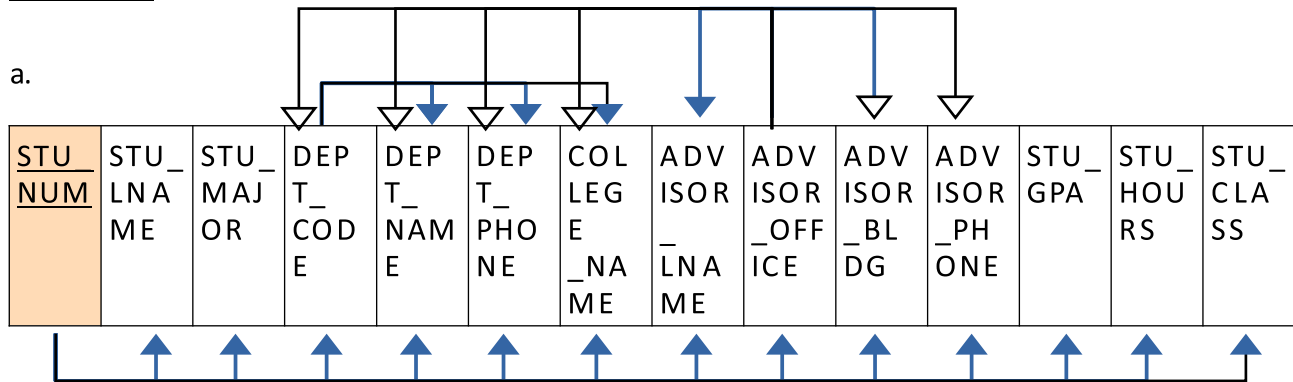
Primary Key = BookTitle, Foreign Key = None, Normal Form = 3NF

<u>BookTitle</u>	Publisher
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Question 2

a.



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

<u>STU_NUM</u>	STU_LNAME	STU_MAJOR	<u>DEPT_CODE</u>	<u>ADVISOR_NUM</u>	STU_GPA	STU_HOURS	STU_CLASS
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Table 2

Primary Key = DEPT_CODE, Foreign Key = None, Normal Form = 3NF

<u>DEPT_CODE</u>	DEPT_NAME	DEPT_PHONE	COLLEGE_NAME
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Table 3:

Primary Key = ADVISOR_NUM, Foreign Key = DEPT_CODE(Table 2), Normal Form = 3NF

<u>ADVISOR_NUM</u>	<u>DEPT_CODE</u>	ADVISOR_BLDG	ADVISOR_PHONE	ADVISOR_OFFICE
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