

2681009

## Question 1

a.

- i. ISBN, Author\_Num  $\rightarrow$  BookTitle = functional dependency.
- ii. ISBN, Author\_Num  $\rightarrow$  LastName = functional dependency.
- iii. ISBN, Author\_Num  $\rightarrow$  Publisher = functional dependency.
- iv. ISBN, Author\_Num  $\rightarrow$  Royalty = functional dependency.
- v. ISBN, Author\_Num  $\rightarrow$  Edition = functional dependency.
- vi. ISBN  $\rightarrow$  BookTitle = partial dependency.
- vii. ISBN  $\rightarrow$  Publisher = partial dependency.
- viii. ISBN  $\rightarrow$  Edition = partial dependency.
- ix. Author\_Num  $\rightarrow$  LastName = partial dependency.
- x. BookTitle  $\rightarrow$  Publisher = transitive dependency.

b.

Table 1

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

<u>ISBN</u>	BookTitle	Publisher	Edition
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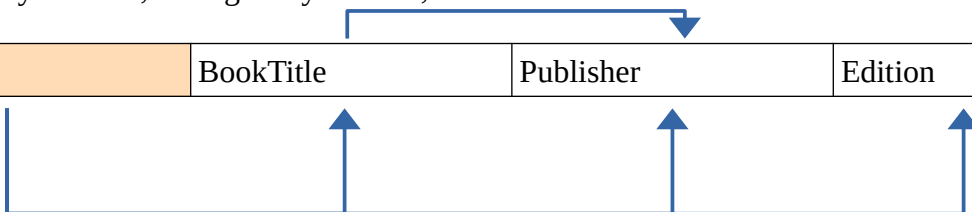


Table 2

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

<u>Author_Num</u>	LastName
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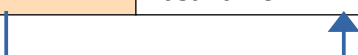
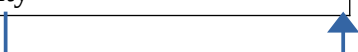


Table 3

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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c.

Table 1

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

<u>ISBN</u>	BookTitle	Edition
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A blue line originates from the ISBN column, extends horizontally to the right, and then splits into two vertical lines. Each vertical line ends with an upward-pointing arrowhead, one pointing to the BookTitle column and the other to the Edition column.

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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A blue line originates from the Author\_Num column, extends horizontally to the right, and then ends with an upward-pointing arrowhead pointing to the Royalty column.

Table 3

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

<u>Author_Num</u>	LastName
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A blue line originates from the Author\_Num column, extends horizontally to the right, and then ends with an upward-pointing arrowhead pointing to the LastName column.

Table 4

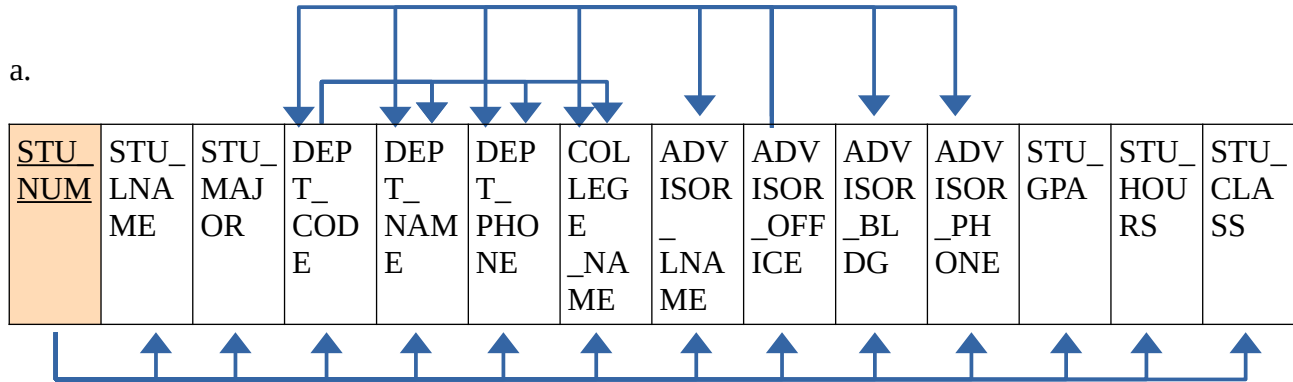
Primary Key = BookTitle, Foreign Key = None, Normal Form = 3NF

<u>BookTitle</u>	Publisher
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A blue line originates from the BookTitle column, extends horizontally to the right, and then ends with an upward-pointing arrowhead pointing to the Publisher column.

## 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\_PHONE → 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
							

Table 2

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


<u>DEPT_CODE</u>	DEPT_NAME	DEPT_PHONE	COLLEGE_NAME
			

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
				