

## DATA MODELING

Name: Vamsi Krishna Bharghava Muktinutalapati

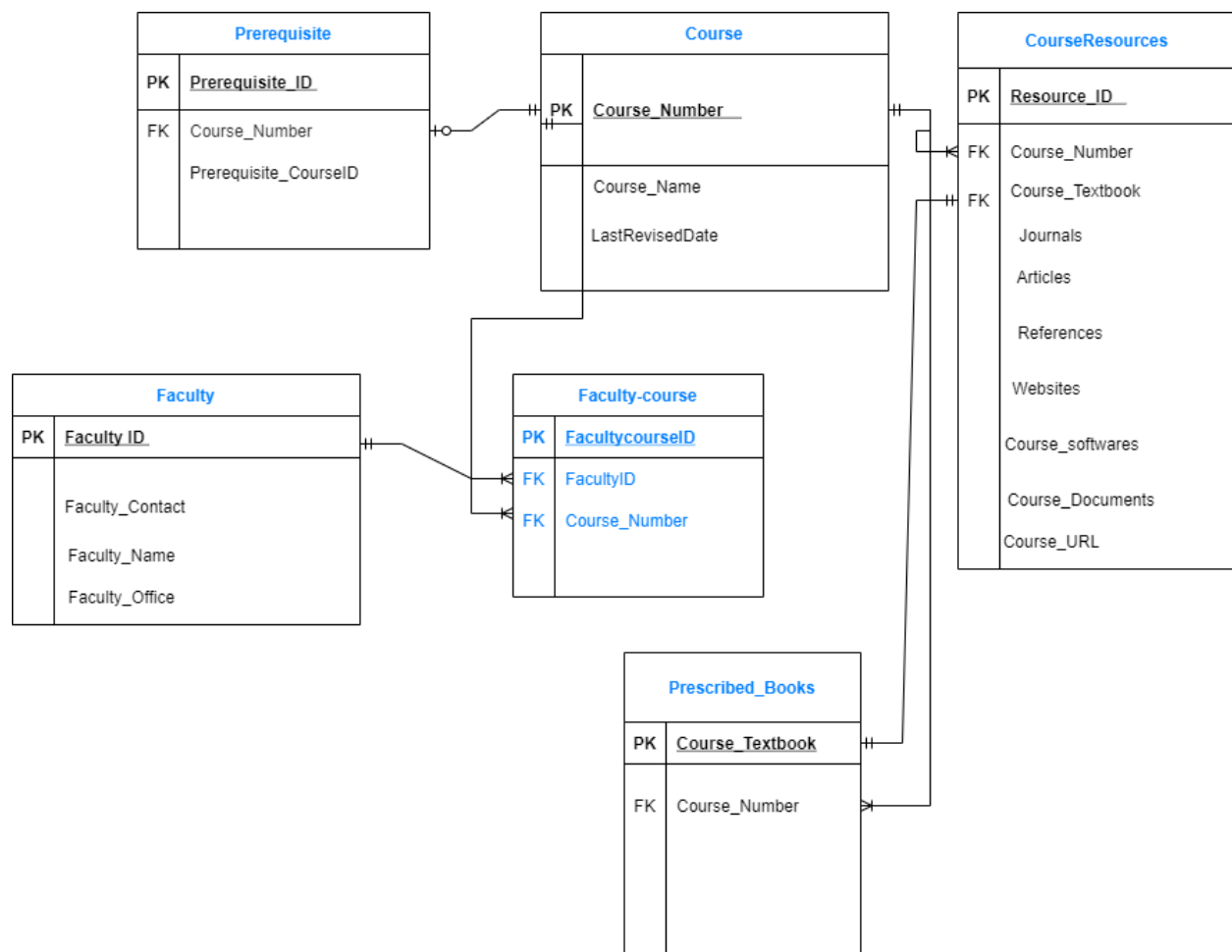
Student ID: 11443219

Course: INFO 5707

### Assignment 3

#### Question 1)

ERD diagram:

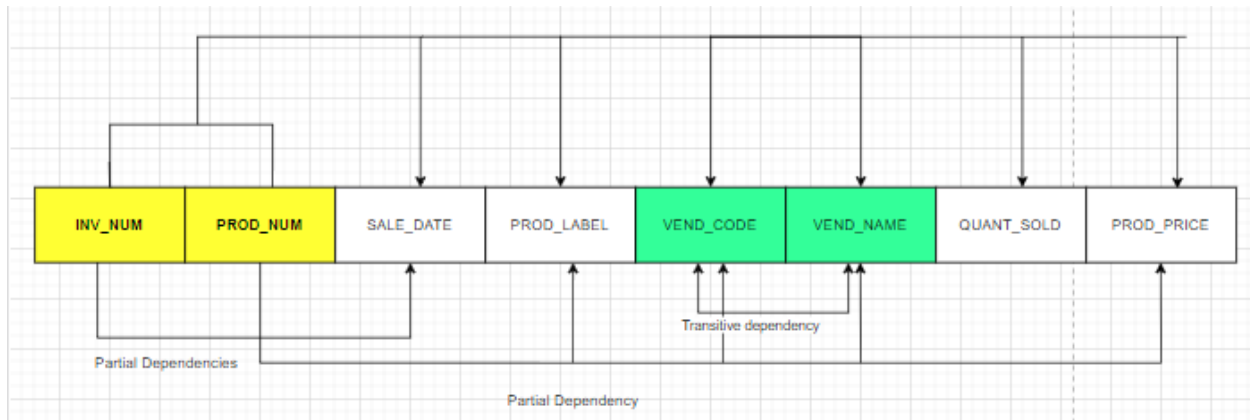


### Explanation on Assumptions:

- 1) I have assumed Prerequisite table, Prescribed books, and Faculty-course table.
- 2) As mentioned in the question, course may or may not have a prerequisite. Hence, I have mapped it as one to optional. In the prescribed books table, I have considered course\_textbook as primary key to map with course resources table as text book is the mandatory resource for every student.
- 3) In my assumption, Each course can be developed by many professors and simultaneously, each professor can involve in development of many courses. This results in Many to Many relationship. As mentioned in Question (Convert M:N relationship, if any, into two 1:M relationships through a composite entity/table), I have created faculty-course table where Many to Many relations has been broken down into Two one to many relations. In precise, for better data optimization, I have created this table.

### Question 2:

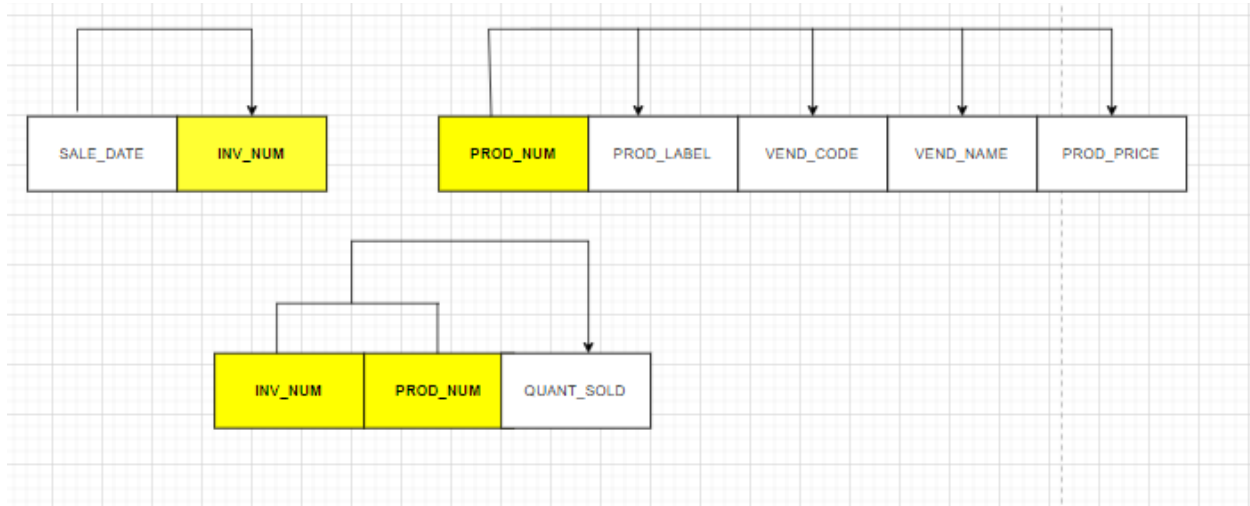
2a)



Both Primary key attributes are highlighted in yellow color and Transitive dependency fields are highlighted in green color for better understanding.

In this dependency diagram, INV\_NUM and PROD\_NUM are two primary keys. Hence, this table is considered as composite key. This has mapped to all the fields as it can affect every attribute in the table.

**2b) Remove all partial dependencies, write the relational structure, and draw the new dependency diagrams. Identify the normal forms for each table structure you created?**



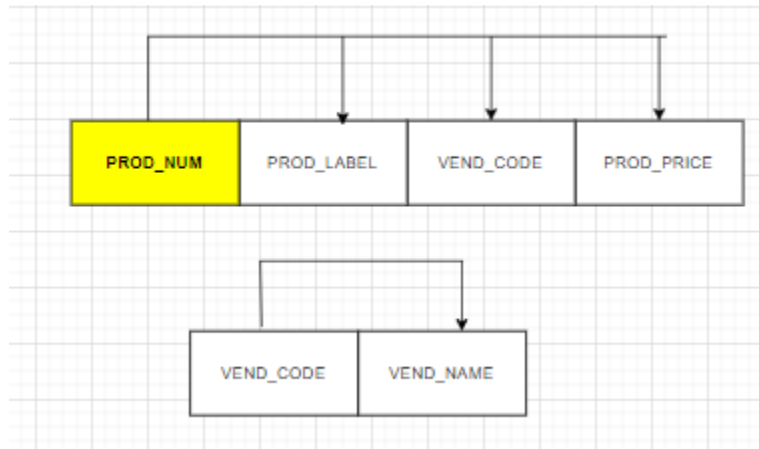
From the above diagram, Sale\_Date attribute can be accessed from the INV\_Number field. Hence, those two attributes are considered as Partial dependency. Prod\_label, Vend\_code, Vend\_Name, Prod\_price can be reflected and accessed by the Prod\_Num field. Hence these are considered as other partial dependency. Where as Vend\_code and Vend\_name are considered as Transitive dependency.

A= (SALE\_DATE, INV\_NUM) – **>3NF** (As this does not have both partial and transitive dependencies)

B= (PROD\_NUM, PROD\_LABEL, VEND\_CODE, VEND\_NAME, PROD\_PRICE) -> **2NF** (This does not have partial, but it has transitive dependency. Hence this is 2NF).

C: (INV\_NUM, PROD\_NUM, QUANT\_SOLD) - **3NF** (As this does not have both partial and transitive dependencies)

2c) Remove all transitive dependencies, write the relational structure, and draw the new dependency diagrams. Also, identify the normal forms for each table structure you created.



D: (PROD\_NUM, PROD\_LABEL, VEND\_CODE, PROD\_PRICE) -3NF

E: (VEND\_CODE, VEND\_NAME)-3NF

Both of them are 3NF as they does not have both partial and transitive dependencies.