Ch6 Normalization Exercise

As usual, please ignore problem numbers and other oddly bulleted items ☺

1. **Using the INVOICE table structure shown in Table P6.3, do the following:**

Table P6.3 Sample INVOICE Records

Attribute Name	Sample Value	Sample Value	Sample Value	Sample Value	Sample Value
INV_NUM	211347	211347	211347	211348	211349
PROD_NUM	AA-E3422QW	QD-300932X	RU-995748G	AA-E3422QW	GH-778345P
SALE_DATE	15-Jan-2016	15-Jan-2016	15-Jan-2016	15-Jan-2016	16-Jan-2016
PROD_LABEL	Rotary sander	0.25-in. drill bit	Band saw	Rotary sander	Power drill
VEND_CODE	211	211	309	211	157
VEND_NAME	NeverFail, Inc.	NeverFail, Inc.	BeGood, Inc.	NeverFail, Inc.	ToughGo, Inc.
QUANT_SOLD	1	8	1	2	1
PROD_PRICE	$49.95	$3.45	$39.99	$49.95	$87.75

a. **Write the relational schema, draw its dependency diagram and identify all dependencies, including all partial and transitive dependencies. You can assume that the table does not contain repeating groups and that any invoice number may reference more than one product. (*Hint*: This table uses a composite primary key.)**

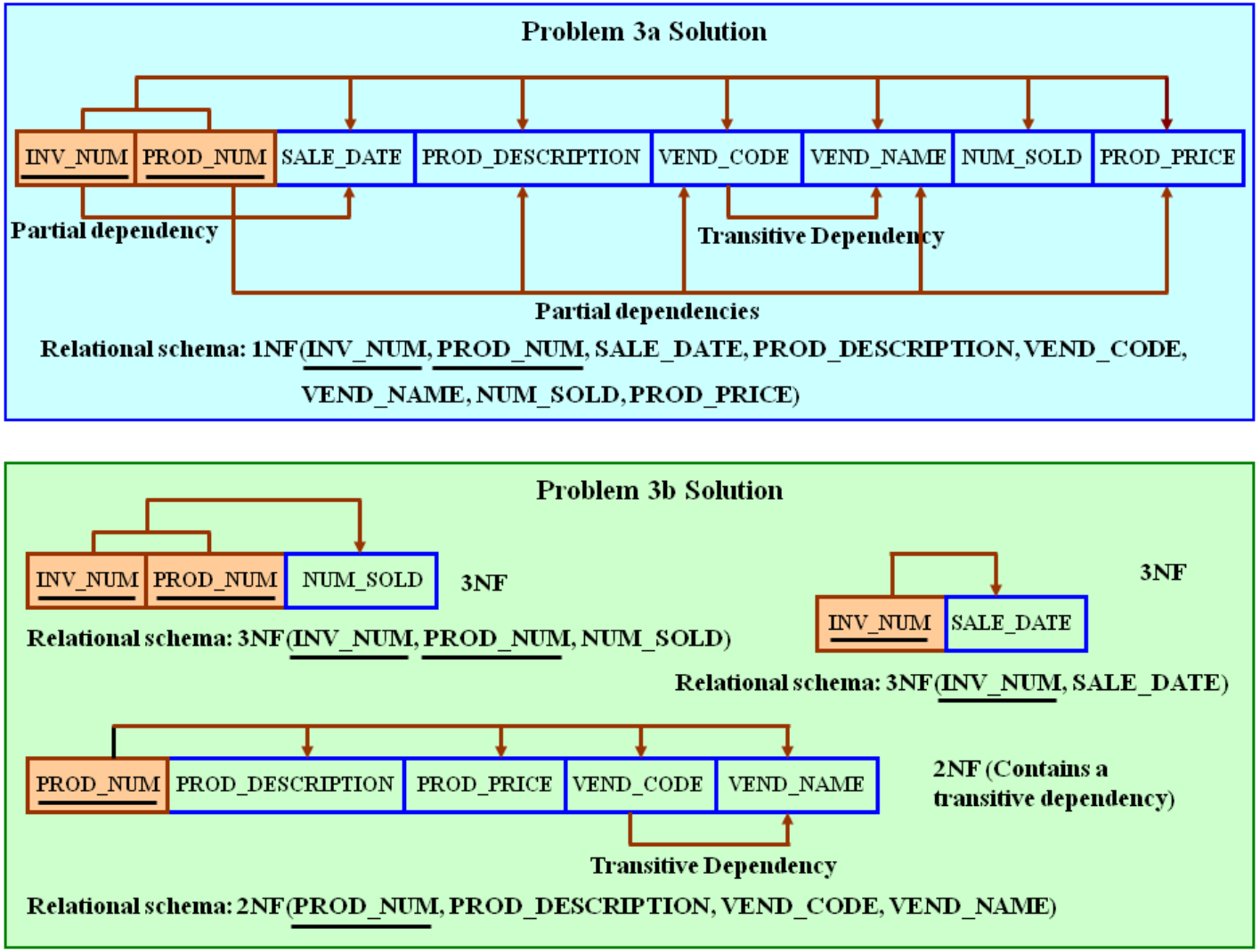
The solutions to both problems (3a and 3b) are shown in Figure P6.3a.

NOTE

We have combined the solutions to Problems 3a and 3b to let you illustrate the start of the normalization process within a single PowerPoint slide. Students generally seem to have an easier time understanding the normalization process if they can compare the normal forms directly. We will continue to use this technique for several of the initial normalization decompositions … if the available PowerPoint slide space permits it.

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

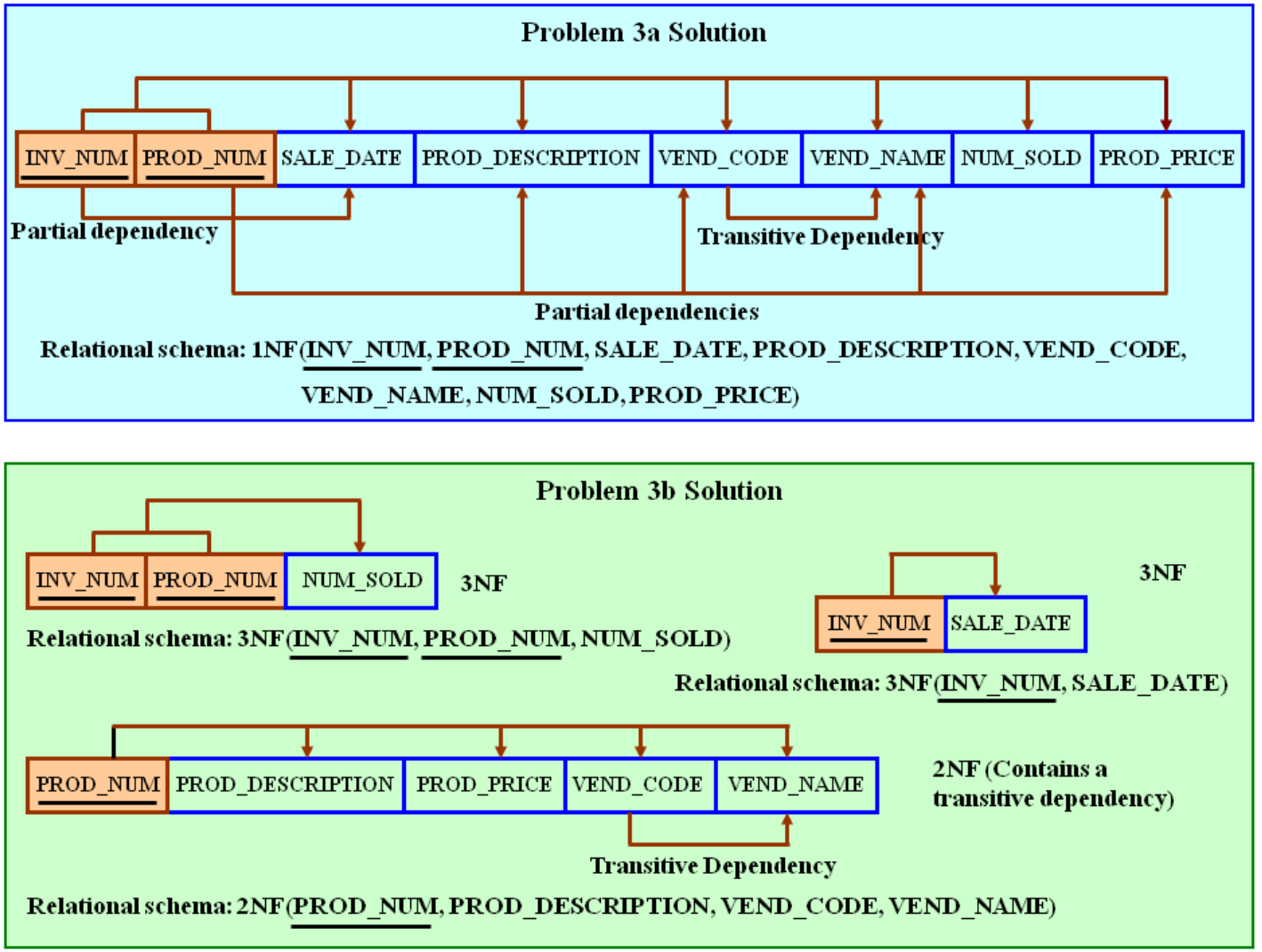
Figure P6.3a The Dependency Diagrams for Problems 3a and 3b



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

To illustrate the effect of Problem 3's complete decomposition, we have shown Problem 3a's dependency diagram again in Figure P6.3c.

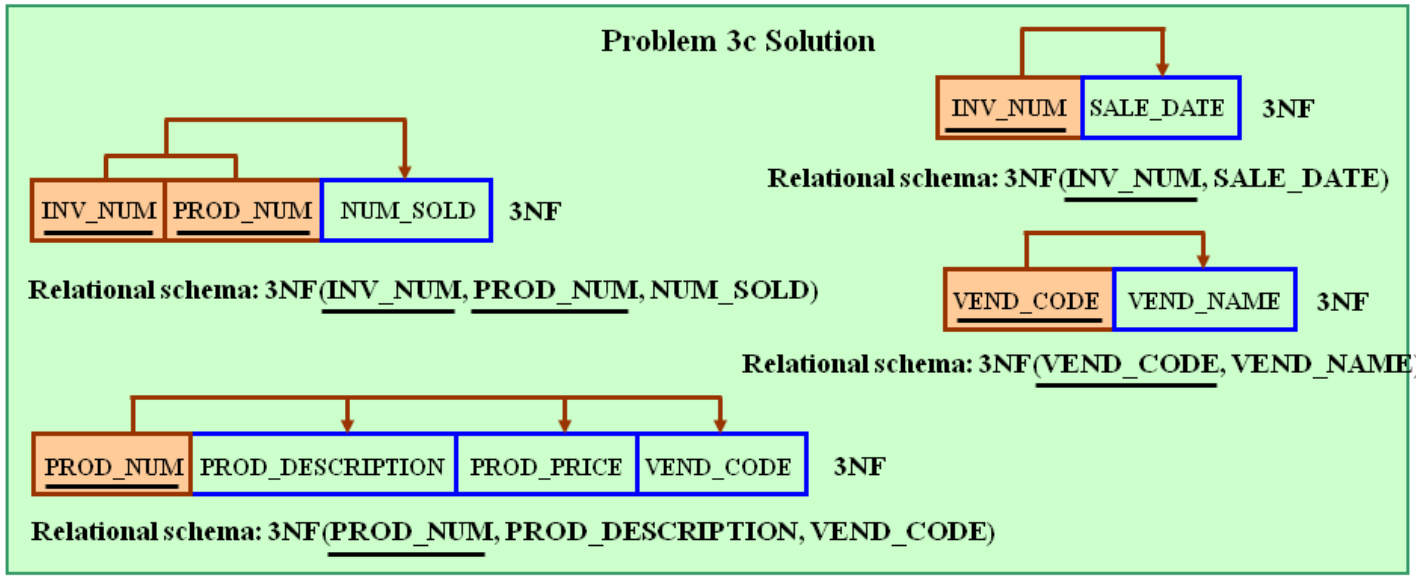
Figure P6.3c The Dependency Diagram for Problem 3c



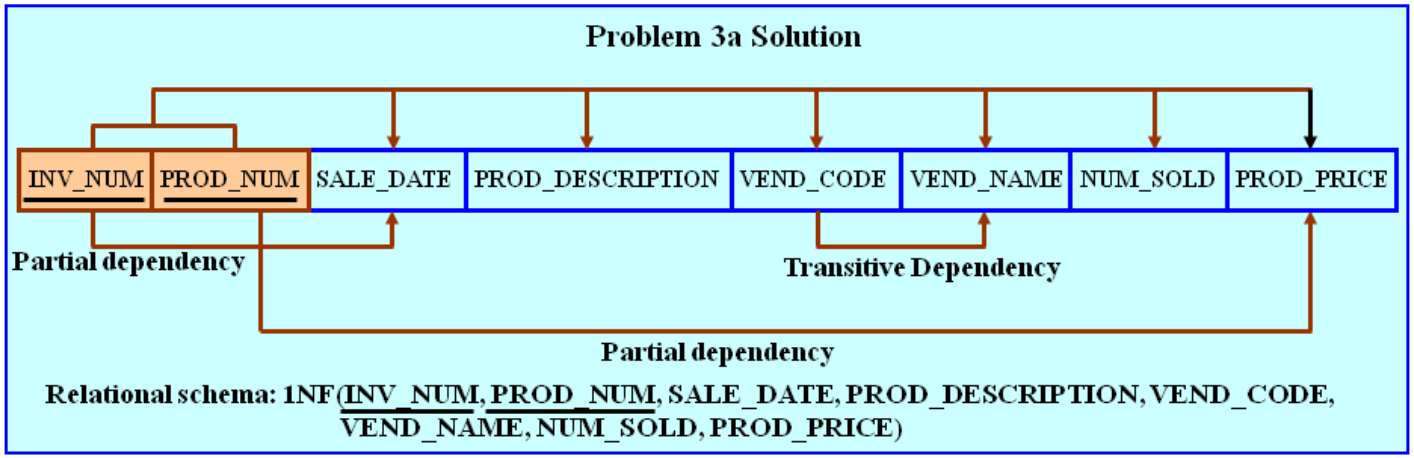
Remove all transitive dependencies, write the relational schema, and draw the new dependency diagrams. Also identify the normal forms for each table structure you created.

To illustrate the effect of Problem 3's complete decomposition, we have shown Problem 3a's dependency diagram again in Figure P6.3c.

Figure P6.3c The Dependency Diagram for Problem 3c



Draw the Crow's Foot ERD.



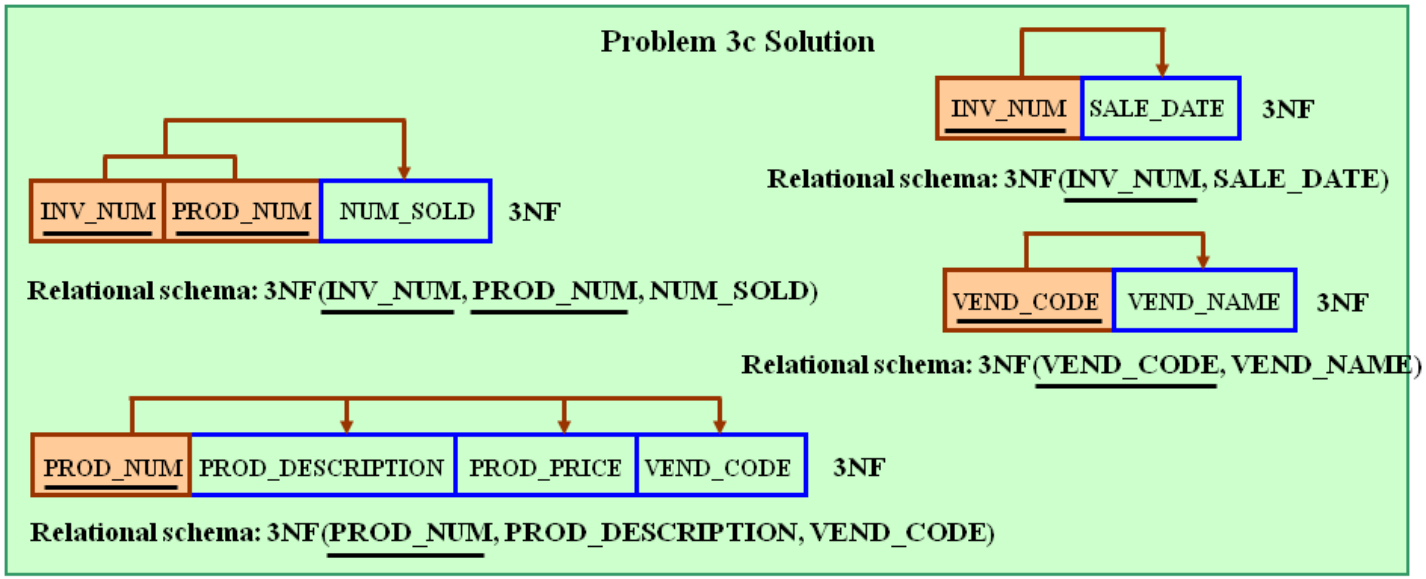
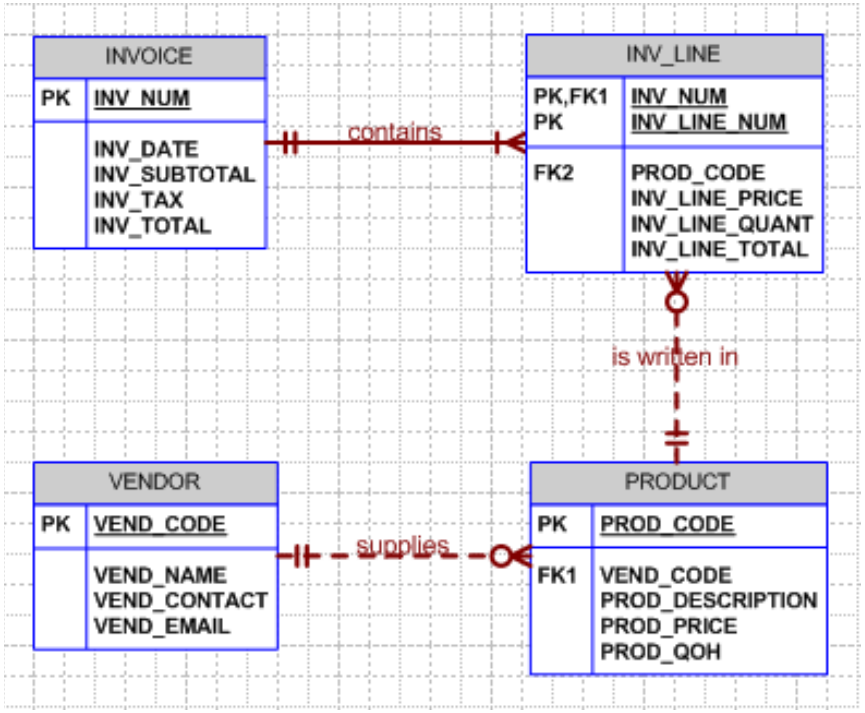


Figure P6.3d The Invoicing ERD and Its (Partial) Relational Diagram



Crow's Foot Invoicing ERD

Invoicing Relational Diagram, Sample Attributes