

## t10o01: Introduction to Decomposition

**Consider this relation:**

<u>Id</u>	Name	Dept_Abbrev	Dept_Name	Dept_Office
2	Phil	CSCI	Computer Science	MOLN 248
4	Lisa	CSCI	Computer Science	MOLN 248
5	Steve	MATH	Mathematics	GRNQ 344
13	Bob	CSCI	Computer Science	MOLN 248
14	Pat	MATH	Mathematics	GRNQ 344

**A bad decomposition of the above:**

<u>Name</u>	Dept_Office
Phil	MOLN 248
Lisa	MOLN 248
Steve	GRNQ 344
Bob	MOLN 248
Pat	GRNQ 344

<u>Id</u>	Dept_Abbrev	Dept_Name	Dept_Office
2	CSCI	Computer Science	MOLN 248
4	CSCI	Computer Science	MOLN 248
5	MATH	Mathematics	GRNQ 344
13	CSCI	Computer Science	MOLN 248
14	MATH	Mathematics	GRNQ 344

**Try to reconstruct StudentDept via  $\bowtie$ :**

<u>Name</u>	Dept_Office	Id	Dept_Abbrev	Dept_Name
Phil	MOLN 248	2	CSCI	Computer Science
Phil	MOLN 248	4	CSCI	Computer Science
⋮	⋮	⋮	⋮	⋮

OK  
not OK!

**A better decomposition:**

<u>Id</u>	Name	Major_Dept
2	Phil	CSCI
4	Lisa	CSCI
5	Steve	MATH
13	Bob	CSCI
14	Pat	MATH

<u>Abbreviation</u>	Name	Office
CSCI	Computer Science	MOLN 248
MATH	Mathematics	GRNQ 344

## t10o02: Why Do We Need More Normal Forms?

**A Non-1NF Relation:**

Bookstore

Course	Professor	Text
Programming	{ Jones, Smith }	{ The Java Coloring Book, Java for the Imbecilic }
Data Structures	{ Jones }	{ The Java Coloring Book, Boxes + Arrows = Linked Lists, Why Trees Grow Down }

**In 1NF:**

B2

<u>Course</u>	<u>Professor</u>	<u>Text</u>
Programming	Jones	The Java Coloring Book
Programming	Jones	Java for the Imbecilic
Programming	Smith	The Java Coloring Book
Programming	Smith	Java for the Imbecilic
Data Structures	Jones	The Java Coloring Book
Data Structures	Jones	Boxes + Arrows = Linked Lists
Data Structures	Jones	Why Trees Grow Down

**A Reasonable Decomposition:**

Teaches

<u>Course</u>	<u>Professor</u>
Programming	Jones
Programming	Smith
Data Structures	Jones

Requires

<u>Course</u>	<u>Text</u>
Programming	The Java Coloring Book
Programming	Java for the Imbecilic
Data Structures	The Java Coloring Book
Data Structures	Boxes + Arrows = Linked Lists
Data Structures	Why Trees Grow Down