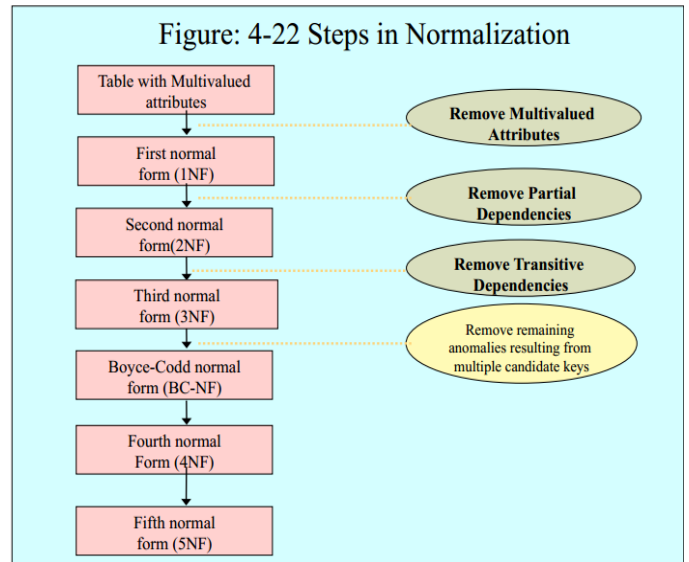


# BCNF

- **Boyce-Codd normal form (BCNF)**  
A relation is in BCNF, if and only if, every determinant is a candidate key.
- **The difference between 3NF and BCNF** is that for a functional dependency  $A \rightarrow B$ , 3NF allows this dependency in a relation if B is a primary-key attribute and A is not a candidate key, whereas BCNF insists that for this dependency to remain in a relation, A must be a candidate key.



## BCNF Example

- **Assume that**
  - For each subject, each student is taught by one Instructor
  - Each Instructor teaches only one subject
  - Each subject is taught by several Instructors

Course, Student  $\rightarrow$  Instructor  
Instructor  $\rightarrow$  Course

Course	Instructor	Student
CS 121	Dr. A. James	Bill Payne
CS 121	Dr. A. James	Tony Perez
CS 121	Dr. A. James	James Atkinson
CS 121	Dr. A. James	Linda Lee

Course	Instructor	Student
CS 141	Dr. T. Watson	Linda Lee
CS 141	Dr. T. Watson	Judith San
CS 141	Dr. T. Watson	Bill Jones
CS 141	Dr. P. Hold	Bill Payne
CS 141	Dr. P. Hold	A. White

Course	Instructor	Student
CS 101	Dr. M. Jones	Linda Lee
CS 101	Dr. M. Jones	Tony Perez
CS 101	Dr. M. Jones	Bill Payne

BCNF: Decompose into (Instructor, Course) and (Student, Instructor)