Example 2:
UNF to 3NF

GradeReport

Number	Name	Address	Number	Title	Name	Room	Mark
38214	Bright	123 Smith St	IS350	Database	CODD	B104	A
			IS465	Sys Anal	KEMP	B213	C
69173	Smith	35 Main Rd	IS465	Sys Anal	*KENP*	B213	A
			PM300	Proj Mgt	LEWIS	D317	B
			QM440	OpSys	KEMP	B213	A

UNF:

StudentSubject(StudentNumber, StudentName, Student-address, SubjectNumber, SubjectName, InstructorName, InstructorRoom, Grade)

StudentSubject

Stu_Num	Stu_Name	Stu_Add	Sub_Num	Sub_Name	Inst_Name	Inst_Room	Grade

Griffith UNIVERSITY

1NF

- **Step 1:** Replace nulls with valid values

GradeReport

Number	Name	Address	Number	Title	Name	Room	Mark
38214	Bright	123 Smith St	IS350	Database	CODD	B104	A
38214	Bright	123 Smith St	IS465	Sys Anal	KEMP	B213	C
69173	Smith	35 Main Rd	IS465	Sys Anal	*KENP*	B213	A
69173	Smith	35 Main Rd	PM300	Proj Mgt	LEWIS	D317	B
69173	Smith	35 Main Rd	QM440	OpSys	KEMP	B213	A

StudentSubject(StudentNumber, StudentName, Student-address, SubjectNumber, SubjectName, InstructorName, InstructorRoom, Grade)

Example 2: Normalisation

1NF

- **Step 2:** Find the primary key

GradeReport

Number	Name	Address	Number	Title	Name	Room	Mark
38214	Bright	123 Smith St	IS350	Database	CODD	B104	A
38214	Bright	123 Smith St	IS465	Sys Anal	KEMP	B213	C
69173	Smith	35 Main Rd	IS465	Sys Anal	*KENP*	B213	A
69173	Smith	35 Main Rd	PM300	Proj Mgt	LEWIS	D317	B
69173	Smith	35 Main Rd	QM440	OpSys	KEMP	B213	A

StudentSubject(StudentNumber, StudentName, Student-address, SubjectNumber, SubjectName, InstructorName, InstructorRoom, Grade)
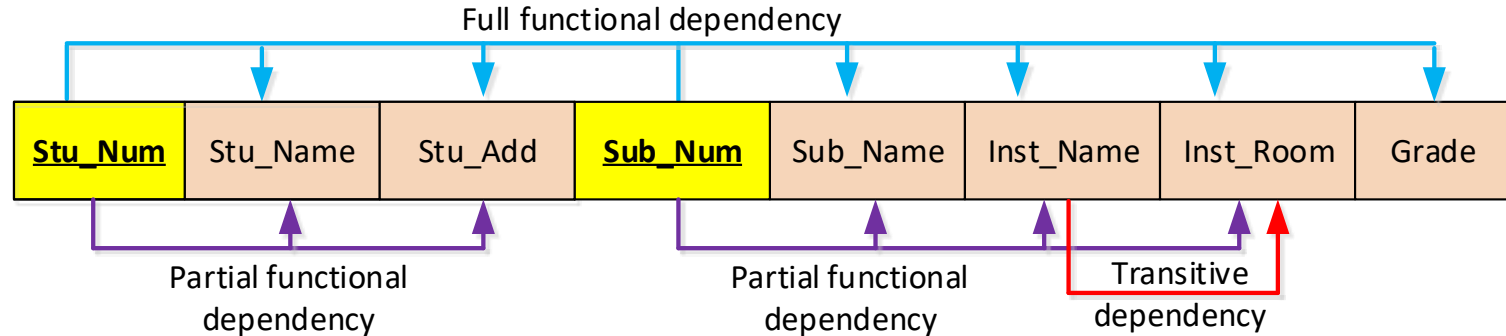
StudentSubject	**Stu_Num**	Stu_Name	Stu_Add	**Sub_Num**	Sub_Name	Inst_Name	Inst_Room	Grade

1NF

- **Step 3:** Find the dependency diagram

Full functional dependency

StudentSubject

| **Stu_Num** | Stu_Name | Stu_Add | **Sub_Num** | Sub_Name | Inst_Name | Inst_Room | Grade |

Partial functional dependency
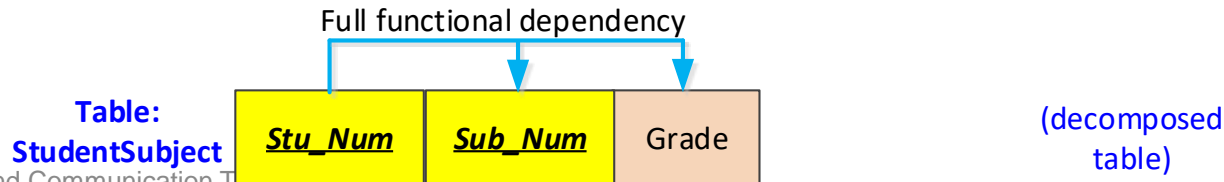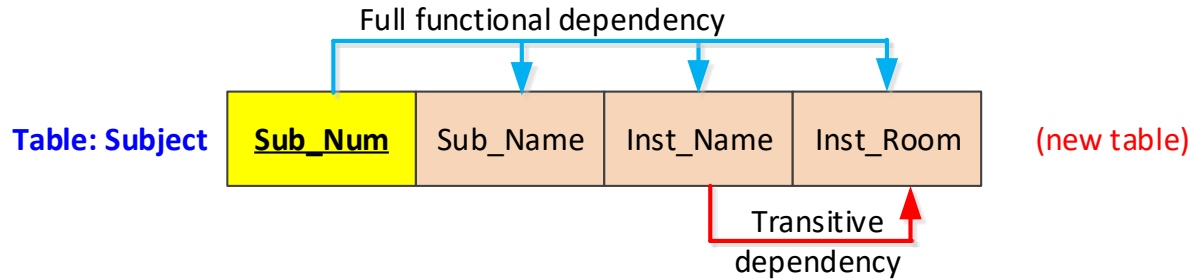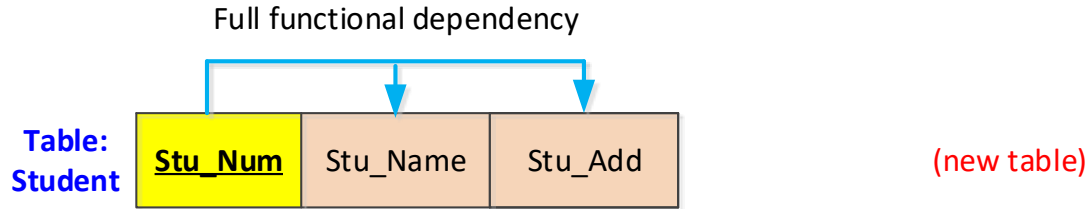
Partial functional dependency

Transitive dependency

- Dependencies above the diagram are expected, and
- Those below are unexpected, so should be eliminated!
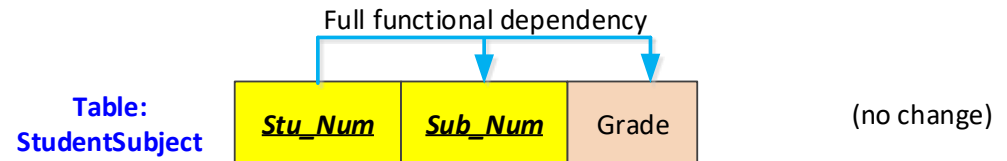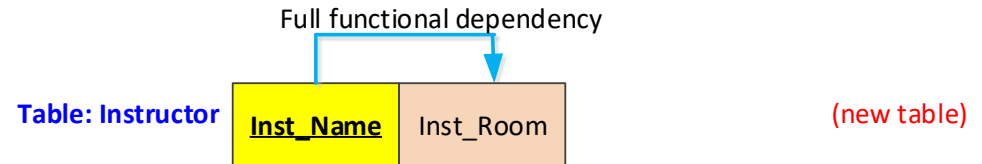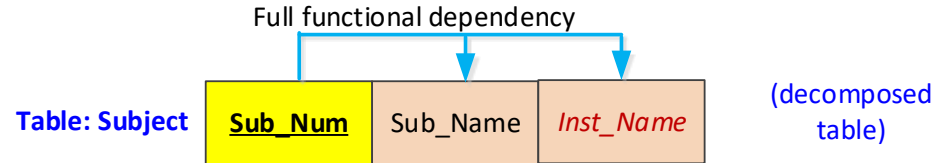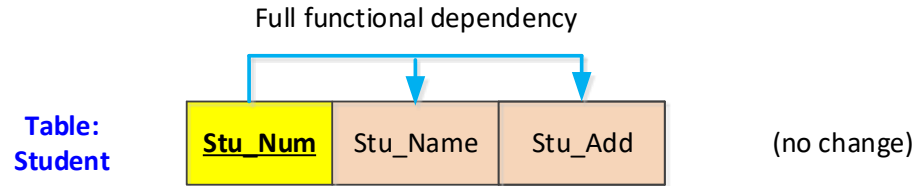
Example 2: Normalisation

2NF

- **Step 4:** Make new tables to eliminate partial dependencies

3NF

- **Step 5:** Make new tables to eliminate transitive dependencies

Full functional dependency

Table: Student

Stu_Num	Stu_Name	Stu_Add

(no change)

Full functional dependency

Table: Subject

Sub_Num	Sub_Name	*Inst_Name*

(decomposed table)

Full functional dependency

Table: Instructor

Inst_Name	Inst_Room

(new table)

Full functional dependency

Table: StudentSubject

Stu_Num	*Sub_Num*	Grade

(no change)

Thank you