The Australian National University, School of Computing
COMP2400/6240 (Relational Databases)
Semester 1, 2025

Lab 6, Week 8

Normalisation

The purpose of this lab is to help you understand the normal forms 3NF and BCNF. In particular, you need to understand:

- What is BCNF? What is 3NF?
- What are the differences between 3NF and BCNF?

Normalisation – Inspection Example

Consider the following relation INSPECTION held at the MyHome real estate agency, in which {PropertyNo, Date} is the primary key:

PropertyNo	Address	Date	Time	StaffNo	StaffName	CameraID
PR4	6 Masson St	18-Oct-11	10:00	S137	Mike Jenk	C211
PR16	8 Berry St	22-Apr-12	09:00	S114	Sue Wang	C323
PR4	6 Masson St	01-Oct-13	12:00	S114	Sue Wang	C323
PR16	8 Berry St	21-Apr-12	13:00	S114	Sue Wang	C323

The set Σ of FDs representing the business rules for INSPECTION is:

(1) {PropertyNo} $\rightarrow$ {Address}

(2) {StaffNo} $\rightarrow$ {StaffName}

(3) {PropertyNo, Date} $\rightarrow$ {StaffNo, Time}

(4) {StaffNo, Date} $\rightarrow$ {CameraID}

(5) {StaffNo, Date, Time} $\rightarrow$ {PropertyNo}

(6) {Date, Time, CameraID} $\rightarrow$ {PropertyNo}

(1) *Find all candidate keys and prime attributes w.r.t.* Σ.

(2) *Is the given set of FDs minimal? If not, determine a minimal cover.*

(3) *Is* Inspection *in 3NF w.r.t.* Σ*? If not, determine a lossless and dependency-preserving 3NF decomposition. Are the relation schemas you have obtained in the decomposition in BCNF? Justify your answers.*

Normalisation – Meeting Example

Consider the relation schema

$$\text{Meeting} = \{\text{CRN, Name, Date, Time, Officer, Cabin}\}$$

with the following set Σ of FDs:

(1) {CRN, Date, Time} → {Officer}

(2) {Date, Time, Cabin} → {CRN}

(3) {Officer, Date, Time} → {CRN}

(4) {Date, Officer} → {Cabin}

(5) {CRN} → {Name}

(4) *Find all candidate keys and prime attributes of* Meeting *w.r.t.* Σ.

(5) *Does* Meeting *satisfy 3NF w.r.t.* Σ*? If not, determine a minimal cover of* Σ*, and a lossless and dependency-preserving 3NF decomposition. Justify your answers.*

(6) *Does* Meeting *satisfy BCNF w.r.t.* Σ*? If not, determine a lossless decomposition for* Meeting *into BCNF. Does your decomposition preserve all dependencies of* Meeting*?*