Tutorial 3 — Normalization, Functional Dependencies

Richard Wong
rk2wong@edu.uwaterloo.ca

Department of Electrical and Computer Engineering
University of Waterloo

January 26, 2018

Exercise 3-1

What are the non-trivial functional dependencies in the following table?

Also, what are the superkeys in the table? What about candidate keys?

id	name	address
1	Alice	123 Park Place
2	Alice	85 Seagram Drive
3	Bob	161 University Avenue W
4	Bob	85 Seagram Drive

Exercise 3-2

What is the highest normal form that the following table fits?

PersonID	Name	FavouriteColourID	ColourName
1	Alice	1	Green
2	Bob	1	Green
3	Eve	2	Blue

Exercise 3-3

What is the highest normal form that the following relation `R(A,B,C,D)` fits?

$A \rightarrow B$
$A \rightarrow C$
$C \rightarrow D$

Exercise 3-4

What is the highest normal form that the following relation `R(A,B,C,D,E)` fits?

$A \rightarrow BCDE$
$E \rightarrow ABCD$
$C \rightarrow D$

Exercise 3-5

What is the highest normal form that the following relation `R(A,B,C,D,E,F)` fits?

$AB \rightarrow CDEF$
$EF \rightarrow ABCD$
$C \rightarrow E$

Exercise 3-6

What is a canonical cover for the following set of FDs?

1. $A \rightarrow BC$
2. $CD \rightarrow E$
3. $B \rightarrow D$
4. $E \rightarrow A$

Exercise 3-7

What is a canonical cover for the following set of FDs?

1. $A \rightarrow BC$
2. $A \rightarrow B$
3. $B \rightarrow C$
4. $AB \rightarrow C$