

CS3402 Tutorial 4:

1. Examine the table shown below.

Branch

| Branch No | BranchAddress | TelNo |
|-----------|--------------------------------------|--|
| B001 | 8 Jefferson Way, Portland, OR 97201 | 503-555-3618, 503-555-2727, 503-555-6534 |
| B002 | City Center Plaza, Seattle, WA 98122 | 206-555-6756, 206-555-8836 |
| B003 | 14 – 8th Avenue, New York, NY 10012 | 212-371-3000 |
| B004 | 16 – 14th Avenue, Seattle, WA 98128 | 206-555-3131, 206-555-4112 |

- (a) Why this table is not in 1NF?
- (b) Describe and illustrate the process of normalizing the data shown in this table to third normal form (3NF).

2. Examine the table shown below.

StaffBranchAllocation

| StaffNo | Branch No | BranchAddress | Name | Position | HoursPer Week |
|---------|-----------|--------------------------------------|---------------|-----------|---------------|
| S4555 | B002 | City Center Plaza, Seattle, WA 98122 | Ellen Layman | Assistant | 16 |
| S4555 | B004 | 16 – 14th Avenue, Seattle, WA 98128 | Ellen Layman | Assistant | 9 |
| S4612 | B002 | City Center Plaza, Seattle, WA 98122 | Dave Sinclair | Assistant | 14 |
| S4612 | B004 | 16 – 14th Avenue, Seattle, WA 98128 | Dave Sinclair | Assistant | 10 |

<StaffNo, BranchNo> is the primary key.

<StaffNo> -> <Name, Position>; <BranchNo> -> <BranchAddress>

- (a) Why this table is not in 2NF?
- (b) Describe and illustrate the process of normalizing the data shown in this table to third normal form (3NF).

3. Examine the table shown below.

BranchManager

| Branch No | BranchAddress | TelNo | MgrStaff No | MgrName |
|-----------|--------------------------------------|--------------|-------------|---------------|
| B001 | 8 Jefferson Way, Portland, OR 97201 | 503-555-3618 | S1500 | Tom Daniels |
| B002 | City Center Plaza, Seattle, WA 98122 | 206-555-6756 | S0010 | Mary Martinez |
| B003 | 14 – 8th Avenue, New York, NY 10012 | 212-371-3000 | S0145 | Art Peters |
| B004 | 16 – 14th Avenue, Seattle, WA 98128 | 206-555-3131 | S2250 | Sally Stern |

<BranchNo> is the primary key; <MgrStaffNo> -> <MgrName>

- (a) Why this table is not in 3NF?
- (b) Describe and illustrate the process of normalizing the data shown in this table to third normal form (3NF).

4. Examine the table shown below and the set of functional dependency on its attributes :

CourseRmAlloc (CourseId, CourseName, Year, Lecturer, Enrollment, RoomId, RoomCapacity, Day, Time)

FD = { *CourseId* -> *CourseName*, *CourseName* -> *CourseId*,
 CourseId, *Year* -> *Lecturer*, *CourseId*, *Year* -> *Enrollment*,
 RoomId -> *RoomCapacity*, *RoomId*, *Year*, *Day*, *Time* -> *CourseId*,
 CourseId, *Year*, *Day*, *Time* -> *RoomId* }

- (a) Find all candidate keys of this table.
(b) Decompose this table into a design into BCNF.

