

# 國立東華大學試題

系所：資訊管理學系

科目：資料庫管理

第1頁/共4頁

## 1. [關於 QBE] (20%)

(a) Fill in the following sketch to find all loan numbers at the Perryridge branch.

<i>loan</i>	<i>loan-number</i>	<i>branch-name</i>	<i>amount</i>

(b) Find **all** loan numbers at the Perryridge branch.

<i>loan</i>	<i>loan-number</i>	<i>branch-name</i>	<i>amount</i>

(c) Find the loan number of all loans with a loan amount of more than \$700

<i>loan</i>	<i>loan-number</i>	<i>branch-name</i>	<i>amount</i>

(d) Find names of all branches that are not located in Brooklyn

<i>branch</i>	<i>branch-name</i>	<i>branch-city</i>	<i>assets</i>

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第2頁/共4頁

## 2. [關於 Integrity] (30%)

Consider the relations: *account*, *branch*

```
create table account
(account-number      char(10),
 branch-name        char(15),
 balance            integer,
 primary key (account-number),
 foreign key (branch-name) references branch)
```

- What is the primary key of *account*?
- What is the primary key of *branch*?
- What means “foreign key (*branch-name*) references *branch*” in above crate table *account*?
- If we have “foreign key (***branch-name***) references ***branch on delete cascade***” then what will happen if we delete the first tuple of *branch*?
- In (d) if we delete the first tuple of *account*?
- What about “**on delete set null**” in (d)?

## 1. *branch*

<i>branch-name</i>	<i>branch-city</i>	<i>assets</i>
Brighton	Brooklyn	7100000
Downtown	Brooklyn	9000000
Mianus	Horseneck	400000
North Town	Rye	3700000
Perryridge	Horseneck	1700000
Pownal	Bennington	300000
Redwood	Palo Alto	2100000
Round Hill	Horseneck	8000000

## 3. *account*

<i>account-number</i>	<i>branch-name</i>	<i>balance</i>
A-101	Downtown	500
A-102	Perryridge	400
A-201	Brighton	900
A-215	Mianus	700
A-217	Brighton	750
A-222	Redwood	700
A-305	Round Hill	350

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第3頁/共4頁

## 3. [關於 Normal Forms] (30%)

Consider the relation named SPData:

- What is the primary key of SPData?
- What means “atomic” in Def 1?
- Is this relation 1NF? Why?
- Is this relation 2NF? [just say yes or no]
- Draw the FD Diagram of SPData.
- Using FD Diagram above and Def 1 to explain your answer of (d).
- Please decompose the SPData into two tables to get next level’s normal form.
- What means “determinant” in Def 3?
- Check your tables in answer (g) and see whether they are in BCNF
- “If a table is in BCNF, then it is in 3NF.” True or False?

## SPData

S#	STATUS	CITY	P#	QTY
S1	20	London	P1	300
S1	20	London	P2	200
S1	20	London	P3	400
S1	20	London	P4	200
S1	20	London	P5	100
S1	20	London	P6	100
S2	10	Paris	P1	300
S2	10	Paris	P2	400
S3	10	Paris	P2	200
S4	20	London	P2	200
S4	20	London	P4	300
S4	20	London	P5	400

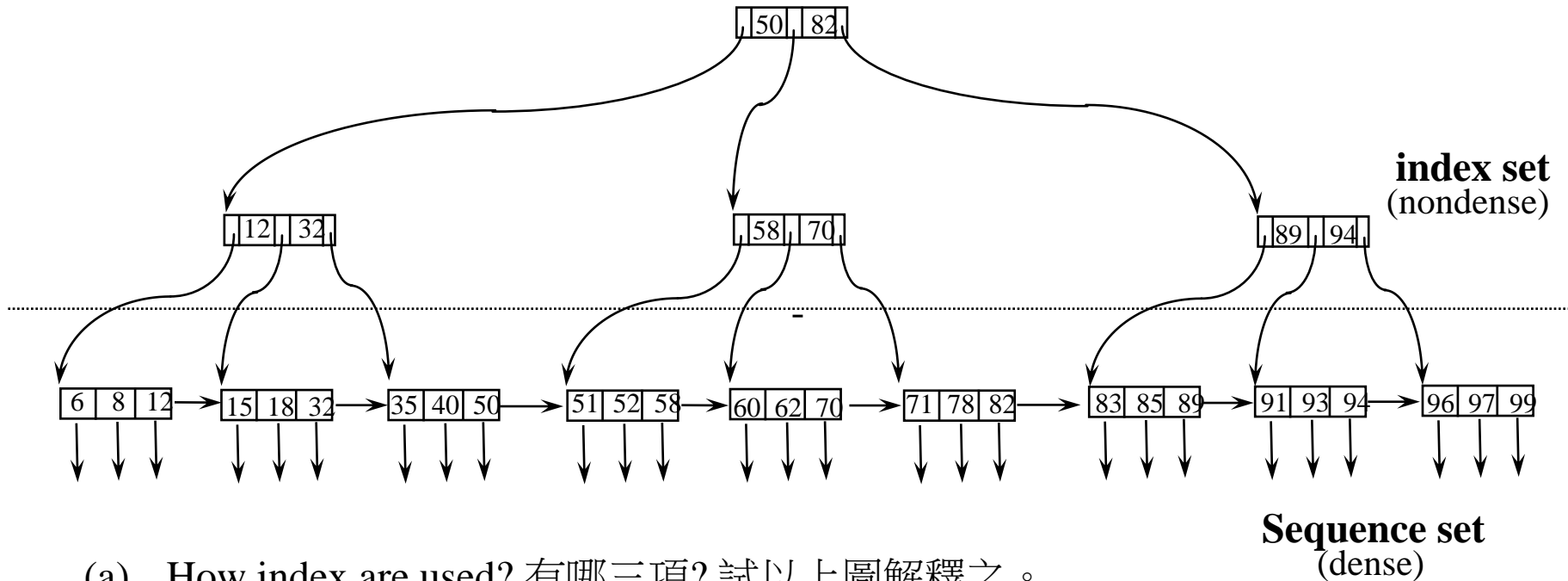
Def 1: A relation R is in 2NF iff

- R is in 1NF (i.e. atomic)
- Non-key attributes are FD on primary key

Def 2: A relation R is in 3NF iff non-key attributes are mutually independent

Def 3: A relation R is in BCNF iff every determinant is a candidate key.

## 4. [關於 B<sup>+</sup> Tree] (25%)



- How index are used? 有哪三項? 試以上圖解釋之。
- Index 有 dense 與 nondense 之分，意義為何?
- How to get record with key = 62, and how many disk I/O are needed to get it?
- If we want to print out all records, at least, how many disk I/O are needed?
- In general, what are the advantages and disadvantages of using “index”?