NEPAL COLLEGE OF INFORMATION TECHNOLOGY Balkumari, Lalitpur

Name of Student:..... College Roll No.: .....

Assesment Solution

2. i) $\Pi_{title, category}(\sigma_{year='1994' \wedge name="Simanta" \wedge pages\ between\ 400\ \&\ 800}(Book \bowtie written\ by \bowtie Author))$

ii) $\gamma_{count(Title)}(\sigma_{year='1990' \wedge name="Simanta"}(book \bowtie written\ by \bowtie Author))$

iii) $Price \leftarrow \Pi_{Price}(\sigma_{Title="DBMS"}(Book))$

$Category \leftarrow \Pi_{category}(\sigma_{Title="DBMS"}(Book))$

$Pages \leftarrow \Pi_{Pages}(\sigma_{Title="OS"}(Book));$

$Book \leftarrow Book \cup \{123456, "ABCD", price, category, pages\}$

iv) $Book1 \leftarrow \Pi_{ISBN, Title, Price*1.15, category, pages}(\sigma_{pages>3000}(Book))$

$Book2 \leftarrow \Pi_{ISBN, Title, Price*0.85, category, pages}(\sigma_{pages<2500}(Book))$

~~$Book \leftarrow Book1 \cup Book2$~~

$Book3 \leftarrow \Pi_{ISBN, Title, Price, category, pages}(\sigma_{pages \geq 2500 \wedge \leq 3000}(Book))$

$Book \leftarrow Book1 \cup Book2 \cup Book3$

v) $\Pi_{Title, Price, category}(\sigma_{Name=null}(Book \bowtie (written\ by \bowtie Author)));$

vi) $_{category}\gamma_{max(Price), min(Price)}(Book)$

2.b) Given,
$z \to w, y \to xz, xw \to y$

Soln:
In above eg, we have non-essential attributes as $\{w, x, y, z\}$ & essential attributes is $\{\}$.
Now,
Closure of $w = \{w\}$
Closure of $x = \{x\}$
Closure of $y = \{y, x, z, w\}$ (using $y \to xz$ and $z \to w$)
Closure of $z = \{zw\}$
Since y is capable of finding all the attributes so it will be a candidate key. Y will not be part of next combination.
Closure of $xw = \{x, w, y, z\}$ [$\because xw \to y$ & $y \to xz$]
Closure of $zw = \{z, w\}$
Closure of $xz = \{x, w, y, z\}$ [$\because z \to w, xw \to y$]
So, xw & xz will be next candidate key, and the next other combination will contain no attributes apart from these candidate keys.
So, There will be 3 candidate keys which are $\{y, xw, xz\}$.

* So, Here all are prime attributes i.e w, x, y, z.

3. b) Sol^n:

Here distance is dependent on Origin & Destination which is transitive dependency. So break it in 2 tables.

Shipment 1

Shipment	Origin	Destination
409	Seattle	Denver
618	Chicago	Dallas
723	Boston	Atlanta
824	Denver	LosAngles
629	Seattle	Denver

Shipment 2

Origin	Destination	Distance
Seattle	Denver	1537
Chicago	Dallas	1058
Boston	Atlanta	1214
Denver	LosAngles	975

3. Assume age is in Student table

ii) Update ~~Student~~ Grade g natural join result r
natural join Student S
Set marks = marks * 1.1
Where age = 50

iii) Select marks
from grade
order by marks desc
limit 1
offset 1

iv) Select avg(marks)
from Student natural (inner) join Result natural
inner join grade
where Sname like "S%a";
optional

v) Select max(marks)
from grade
group by stream
order by max(marks)

vi) Rules for Performing Union & Intersection
- Every Select statement with Union & intersection must have same number of columns.
- The columns must have similar data types.
- The column in every Select statement must also be in same order.