
DATABASE

CSE3103 : Database

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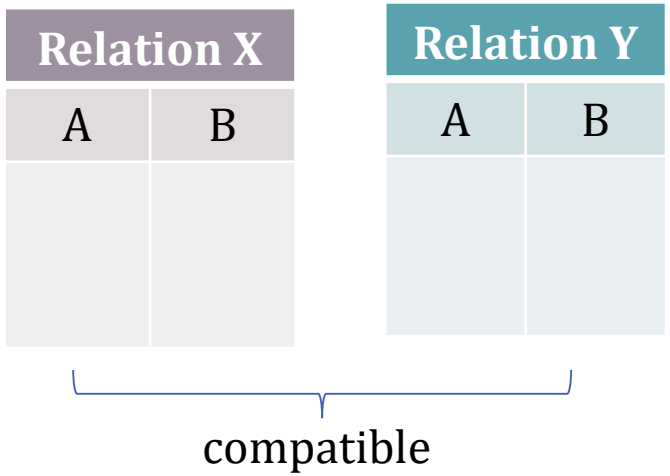
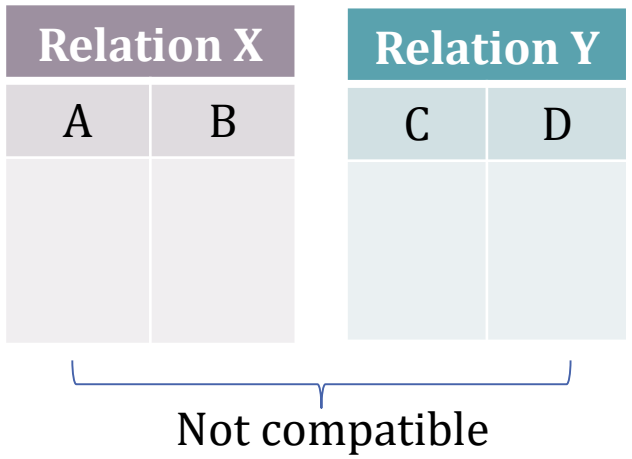
Binary Operation Compatibility

- To perform Union, Intersection, difference operation relations should be UNION compatible.
- Two relations are UNION compatible if they have same number of attributes and belong to the same domain.
  - Column number need to be same.
  - Domain Type need to be same.





Binary Operation : Union

R	
A	B
α	1
α	2
β	1

S	
A	B
α	2
β	3

UNION Operation among R and S relation

R U S =

R	
A	B
α	1
α	2
β	1

U

S	
A	B
α	2
β	3

=

R U S	
A	B
α	1
α	2
β	1
β	3

Binary Operation : Intersection

R	
A	B
α	1
α	2
β	1

S	
A	B
α	2
β	3

Intersection Operation among R and S relation

$R \cap S =$

R	
A	B
α	1
α	2
β	1

$\cap$

S	
A	B
α	2
β	3

$=$

R ∩ S	
A	B
α	2

Binary Operation : Difference

R	
A	B
α	1
α	2
β	1

S	
A	B
α	2
β	3

Difference Operation among R and S relation

R - S =

R	
A	B
α	1
α	2
β	1

-

S	
A	B
α	2
β	3

=

R - S	
A	B
α	1
β	1

S - R =

S	
A	B
α	2
β	3

-

R	
A	B
α	1
α	2
β	1

=

R - S	
A	B
β	3

Binary Operation : Division

R	
A	B
α	1
α	2
β	1
θ	2

S
B
1
2

Division Operation among R and S relation

R / S =

R	
A	B
α	1
α	2
β	1
θ	2

/

S
B
1
2

=

R / S
A
α

Rules :

1. The uncommon columns in divisor and dividend column will be the resulting column. Suppose ABC/C so AB will be the result column.
2. Elements that are jointly common with the dividend will be an account as quotient. There is no chance to keep the remainder.
3. If there are no common with the dividend then the quotient will be zero.

Binary Operation : Division

R	
A	B
s1	p1
s1	p2
s1	p3
s1	p4
s2	p1
s2	p2
s3	p2
s4	p2
s4	p4

S
B
p2

T
B
p4

R / S =

R	
A	B
s1	p1
s1	p2
s1	p3
s1	p4
s2	p1
s2	p2
s3	p2
s4	p2
s4	p4

/

S
B
p2

=

R / S
A
s1
s2
s3
s4

R / T =

R / T
A
s1
s4

Cartesian Product Operation

R
A
α
β

S
B
1
2
3

R X S =

R
A
α
β

X

S
B
1
2
3

=

R X S	
A	B
α	1
α	2
α	3
β	1
β	2
β	3

Cartesian Product Operation

R	
A	B
α	1
α	2

S	
B	C
1	X
2	Y

R X S =

R	
A	B
α	1
α	2

X

S	
B	C
1	X
2	Y

=

?

R X S			
A	B	B	C
α	1	1	X
α	1	2	Y
α	2	1	X
α	2	2	Y

$\rho_{B \to R.B}\ (R)$

$\rho_{B \to S.B}\ (S)$

So, Finally

R X S =

R X S			
A	R.B	S.B	C
α	1	1	X
α	1	2	Y
α	2	1	X
α	2	2	Y


DBMS
data
database
distributed
parallel
shared
system
Distributed
architecture
DBMSs
memory
network
processing
performance
systems
processors
access
centralized
multiple
sites
single
nothing
DDBMS
Shared
technology
computer
disk
stored
processor
Parallel
may
fragments
typically
require
physically
site
users
applications
computers
application
management
transparent
bottleneck
interconnection
Figure
organizational
administered
logically
local
large
sometimes
computing
one
split
provide
decentralized
directly
disks
islands
remote
defined
controlled
based
number
user
Management
makes
make
replicated
also
many
discuss
often
major
fact
across
eliminates
reliability
communication
distribution
control
scalability
approach
improve
distinction
logical
databases
definition
development
nodes
capable
least
used
partitioned
consists
global
collection
structure
provides
associated
incompatible
way
must
System
mode
Database
like
within
machines
operational
referred
scalable
architectures
order
resources
Date
com
per
dis