

Database Assignment5

Group 4

Name: Yi Chiun Chang

E-mail: changyic@oregonstate.edu ONID: changyic

ID number: 934533510

2: Query optimization

$B(R)=1000$, $B(S)=750$, $B(W)=500$, $B(U)=250$

Query	Size	Cost	Plan
R, S	200	8750	$R \bowtie S$
R, W	40000	7500	$R \bowtie W$
R, U	40000	6250	$R \bowtie U$
S, W	60000	6250	$S \bowtie W$
S, U	ignore	5000	$S \bowtie U$
W, U	20000	3750	$W \bowtie U$
R, S, W	4000	11500	$(S \bowtie R) \bowtie W$
R, S, U	2000	10250	$(S \bowtie R) \bowtie U$
R, W, U	4000	33750	$(U \bowtie W) \bowtie R$
S, W, U	600000	32500	$(U \bowtie W) \bowtie S$
R, S, W, U	Final join doesn't need to compute	15250	$((S \bowtie R) \bowtie U) \bowtie W$

3: Query Containment

An example where the homomorphism theorem does not hold

Consider the following queries with comparison operators:

- $q1(x) :- R(x,y), x > 30 \text{ AND } x < 40$
- $q2(x) :- R(x,y), x > 35$

In this example, assume that a homomorphism h from $q2$ to $q1$ can map x to x and y to y . The condition in $q1$ is stricter than in $q2$. For example, when the $x = 41$, x is satisfied with $q2$ but not $q1$. According to the homomorphism theorem for conjunctive queries, if there is a homomorphism from $q2$ to $q1$, then every answer of $q2$ should also be an answer to $q1$. However, in this case, the answers to $q2$ are not entirely contained within the answers to $q1$ because of the additional constraints introduced by the comparison operators.

This example demonstrates that the comparison conditions lead to situations where a homomorphism exists but the subset relationship between the answer sets does not hold.