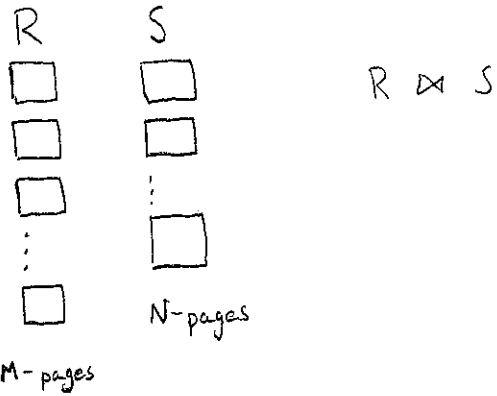


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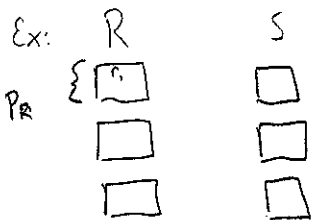
Database

Notes



1. Simple NLJ. → You can choose which will be inner or outer table.

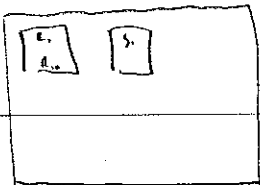
For $r \in R$ → outer table
For $s \in S$ → inner table
if (r matches s)
then $(r, s) \rightarrow$ result



$P_R * M * N + M$: How many pages to read.

2. Page-based NLJ

$$M * N + M$$



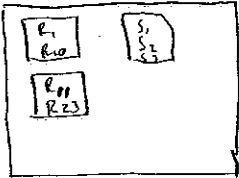
Match all the $R_i - R_{i0}$ with all the S_i .

→ Is the same thing as block-nested.

$R \rightarrow$ is the largest amount of pages.
for equation.

3. Block-Based NLJ

Number of rounds: $\frac{M}{R} * N + M$



Match everything in S_1 -page with everything in both pages of R -pages.

Ex: cost in

Ex of Homework:

Cost of Block-based: $\frac{M}{B-2} * N + M$

B = total # of pages in buffer pool.

IN TEST: Will ask which will be better to use as outer/inner table?

4. index-based NLJ,

Ex: If given

$R \bowtie S$

$R.scl = S.scl$

$S.scl$ is indexed by B^+ -tree.

} You would use R as outer table.

Cost:

$M + M * P_R * C$

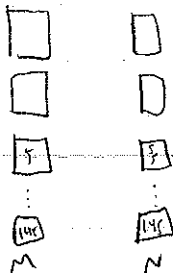
3 or 4 = B^+ -tree

1 or 2 = hash-based

5. Sort-Merge Join (Sort first, then merge)

→ Assume everything is already sorted.

→ will prob. be 2.



I. Sorting Phase - $c(M+N)$

II. Merge Phase - $M+N$

Practic Test. (Review)

#5)

1) $A \rightarrow BC$

2) $CD \rightarrow E$

3) $B \rightarrow D$

4) $E \rightarrow A$

ABCDE

$$A^+ = \{A, D, C, D, E\}$$

$$E^+ = \{$$

$$CD =$$

$$DC =$$

B is not prime.

✓ 2NF: all non-prime attributes will not depend on a part of any key.

3NF: $X \rightarrow A \Rightarrow$ 1) X is key
2) A is prime

BCNF: $X \rightarrow A \Rightarrow X$ is key

B is not a key by itself.