Digital Receipt

This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

Submission author:	Jk J
Assignment title:	Tasky
Submission title:	Mathwork
File name:	Reworked.docx
File size:	237.66K
Page count:	6
Word count:	625
Character count:	2,685
Submission date:	09-Apr-2021 09:04PM (UTC-0500)
Submission ID:	1555082297

WORKED OUT ANSWERS

Part 1

Problem 1

1. Suppose B(R) = B(S) = 10,000. For what value of M would we need to compute R !" S using the nested-loop join algorithm with no more than the following number of I/Os? (8 points, 4 points each)

Using the equation given in Section 15.3.4 of the textbook, solve for M:

I/O = B(S) + $\frac{(B(S)B(R))}{(M-1)}$

(a) 100,000
$100{,}000 = 10{,}000 + \frac{(10{,}000 \times 10{,}000)}{(M-1)}$
M = 1,112.1 or ceil(M) = 1,113

(b) 25,000
$25{,}000 = 10{,}000 + \frac{(10{,}000 \times 10{,}000)}{(M-1)}$
M = 6,667.7 or ceil(M) = 6,668

2. If two relations R and S are both unclustered, it seems that the nested-loop join algorithmrequires about T(R)T(S)/M disk I/Os. How can you do signicantly better than this cost? Describe your modied version of the nested-loop algorithm and give the number of disk I/Os required for your algorithm. We assume that M is large enough such that M ? 1 ! M , and that B(R) ! T (R) and B(S) ! T (S); that is, the number of tuples of a relation is much greater than that of blocks of the relation. (8 points)

Note that the cost of algorithm given in the question is T(R)T(S)/M, which means it is using tuple-based nested-loop join. In order to improve the disk I/O cost of nested-loop join algorithm, we need to use block-based nested-loop join. In order to carry out block-based nested loop join efficiently, we need the inner relation clustered, and search structure built on the common attributes of R and S.

Let R be the inner relation (assuming S is smaller):