

《数据库系统》

作业 11

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日期: 2024 年 5 月 2 日

15.2

$$\Pi_{T.branch_name}((\Pi_{branch_name,assets}(\rho_T(branch))) \bowtie_{T.assets>S.assets} (\Pi_{assets}(\sigma_{branch_city='Brooklyn'}(\rho_S(branch)))))$$

图 1:

15.3

r1 800 blocks, r2 1500 blocks; 设内存大小为 M blocks.

◇ a. Nested-loop join.

1. r1 在外层: $20000 \times 1500 + 800 = 30000800$ disk accesses. $20000 + 800 = 20800$ disk seeks.
2. r2 在外层: $45000 \times 800 + 1500 = 36001,00$ disk accesses. $45000 + 1500 = 46500$ disk seeks.

◇ b. Block nested-loop join

1. r1 在外层 $\lceil \frac{800}{M-2} \rceil \times 1500 + 800$ disk accesses. $2 \times \lceil \frac{800}{M-2} \rceil$ disk seeks.
2. r2 在外层 $\lceil \frac{1500}{M-2} \rceil \times 800 + 1500$ disk accesses. $2 \times \lceil \frac{1500}{M-2} \rceil$ disk seeks.

◇ c. Merge join. 假设 $b_b = 1$ $B_s = 1500(2\lceil \log_{M-1}(\frac{1500}{M}) \rceil + 2) + 800(2\lceil \log_{M-1}(\frac{800}{M}) \rceil + 2)$ $B_r = 1500 + 800$ 那么 $B_r + B_s$ disk accesses and disk seeks.

◇ d. Hash join.

1. if no need recursive partitioning : $3 \times (1500 + 800) = 6900$ disk accesses, $2 \times (1500 + 800) = 4600$ disk seeks.
2. if recursive partitioning required : $2 \times (1500 + 800)\lceil \log_{M-1}(800) - 1 \rceil + 1500 + 800$ disk accesses, $2 \times (1500 + 800)\lceil \log_{M-1}(800) - 1 \rceil$ disk seeks.