Homework #11

15.2

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

15.3

a.

- If $r1$ is the outer relation

  $20000 * 1500 + 800$ accesses

  $20000 + 800 = 20800$ seeks
- If $r2$ is the outer relation

  $45000 * 800 + 1500$ accesses

  $45000 + 1500$ seeks

b.

- If $r1$ is the outer relation

  $\lceil 800M - 2 \rceil * 1500 + 800$ accesses

  $2 * \lceil 800M - 2 \rceil$ disk seeks
- If $r2$ is the outer relation

  $\lceil 1500M - 2 \rceil * 800 + 1500$ accesses

  $2 * \lceil 1500M - 2 \rceil$ disk seeks

c.

- If $r1$ and $r2$ are not initially sorted on the join key

  $Bs = 1500(2\lceil logM - 1(1500/M) \rceil + 2) + 800(2\lceil logM - 1(800/M) \rceil + 2)$ accesses
- If tuples with the same value for the join attributes fit in memory

  $Bs + 1500 + 800$ accesses

d.

$r1$ as build relation, $r2$ as the probe relation

- If $M > 800/M$

  $3(1500 + 800)$ accesses
- else

  $2(1500 + 800)\lceil logM - 1(800) - 1 \rceil + 1500 + 800$ accesses