HW2 Sol

1. ()
   1. Both are primary keys, so each tuple is going to match with at most one other tuple. So lower bound = 0 (no guarantee of a match), upper bound = 10000 (each tuple of A match with a tuple of B) [Notice the other side don’t work, (Why?))
   2. B.x refer to A.x, so each tuple of B will match with a tuple of A, so lower bound = upper bound = 20000
   3. Each value of A.x will match with each value of B.x.

So each tuple of A will match with 20000/100 tuples of B, so lower bound = upper bound = 10000 \* 20000 / 100 = 2000000

* 1. Similar to above, but halved on both sizes: upper = lower bound = 10000/2 \* 20000/(100\*2) = 500,000

1. ()

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Time | T1 | T2 | T3 | T4 |
| 1 |  |  | S-Lock(X)  X3 = Read(X) |  |
| 2 | S-Lock(Y)  Y1 = Read(Y) |  |  |  |
| 3 |  |  |  | S-Lock(Z)  Z4 = Read(Z) |
| 4 |  | S-Lock(X)  X2 = Read(X) |  |  |
| 5 |  |  | X3 = X3 + 1 |  |
| 6 | S-Lock(Z)  Z1 = Read(Z) |  |  |  |
| 7 |  | X2 = X2 \* 2 |  |  |
| 8 | Z1 = Z1 + Y1 |  |  |  |
| 9 | X-Lock(Z)  Wait  Write(Z, Z1) |  |  |  |
| 10 |  |  |  | Z4 = Z4 \* 3 |
| 11 |  |  | Y3 = Y3 – X3 |  |
| 12 |  |  | X-Lock(Y)  Abort |  |
| 13 |  | S-lock(Y)  Y2 = Read(Y) |  |  |
| 14 |  | Y2 = Y2 + 4 |  |  |
| 15 |  | X-lock(Y)  Abort |  |  |
| 16 |  |  |  | X-Lock(Z)  Abort |
| 17 | Write(Z, Z1)  Commit |  |  |  |