Video Activities-Week-8

Submitted By: - Parth Parashar

Video 13.1 (Loop join basics)

OpenSSH SSH client

```
spr2022adb35=> select * from authors A, books B where A.id = B.authorid
spr2022adb35-> ;
 id |       name       | age | id |              title               | pagecount |       genre       | authorid | pubid
----+------------------+-----+----+----------------------------------+-----------+-------------------+----------+-------
 10 | Stephen King     |  71 |  1 | It                               |      1138 | Horror            |       10 |   100
 13 | Shakespeare      |     |  2 | Hamlet                           |       500 | Tragedy           |       13 |   103
 14 | Maya Angelou     |     |  3 | I Know Why the Caged Bird Sings  |       304 | Autobiographical  |       14 |   102
 15 | Vikram Seth      |  68 |  4 | A Suitable Boy                   |      1349 | Drama/Romance     |       15 |   103
 15 | Vikram Seth      |  68 |  8 | From Heaven Lake                 |       464 | Travel            |       15 |   102
 16 | Amy Tan          |  69 |  5 | The Joy Luck Club                |       288 | Drama             |       16 |   104
 17 | Laura Esquivel   |  70 |  7 | Tita's Diary                     |       294 | Romance/Diary     |       17 |
 17 | Laura Esquivel   |  70 |  6 | Like Water for Chocolate         |       256 | Romance/Tragedy   |       17 |   105
 18 | Khaled Hosseini  |  55 |  9 | Kite Runner                      |       371 | Historical/Drama  |       18 |   106
 19 | Brit Bennett     |  31 | 10 | The Vanishing Half               |       352 | Historical/Drama  |       19 |   106
 20 | Lang Leav        |  40 | 11 | September Love                   |       224 | Romance           |       20 |   107
 20 | Lang Leav        |  40 | 14 | Love and Misadventure            |       176 | Romance           |       20 |   107
 21 | Colson Whitehead |  51 | 12 | The Nickel Boys                  |       224 | Historical        |       21 |   108
 22 | Paulo Coelho     |  73 | 13 | The Alchemist                    |       163 | Fantasy/Adventure |       22 |   103
 23 | clare pooley     |  49 | 15 | The Authenticity Project         |       384 | Romance           |       23 |   102
 24 | John Green       |     | 17 | Looking for Alaska               |       620 | Young Adult       |       24 |   100
 24 | John Green       |     | 16 | Paper Towns                      |       420 | Young adult       |       24 |   100
(17 rows)

spr2022adb35=>
```

Cost = M + Pa*M + N

1000+ 1000*500 = 501000 I/Os (A outer)

Cost = 500 + 500*1000 = 500500 I/Os (B outer)

With M=1000 in A and N=5 in B

Cost = M + M*N = 1000 + 1000*5 = 6000 I/Os (A outer)

Cost = N +N*M = 5 + 5*1000 = 5005 I/Os (B outer)

Now, for the given conditions, the smaller relation must be used as the outer relation.

Video 13.2

OpenSSH SSH client

```
spr2022adb35=> select * from authors A, books B where A.id = B.authorid
spr2022adb35-> ;
 id |       name       | age | id |              title               | pagecount |       genre       | authorid | pubid
----+------------------+-----+----+----------------------------------+-----------+-------------------+----------+-------
 10 | Stephen King     |  71 |  1 | It                               |      1138 | Horror            |       10 |   100
 13 | Shakespeare      |     |  2 | Hamlet                           |       500 | Tragedy           |       13 |   103
 14 | Maya Angelou     |     |  3 | I Know Why the Caged Bird Sings  |       304 | Autobiographical  |       14 |   102
 15 | Vikram Seth      |  68 |  4 | A Suitable Boy                   |      1349 | Drama/Romance     |       15 |   103
 15 | Vikram Seth      |  68 |  8 | From Heaven Lake                 |       464 | Travel            |       15 |   102
 16 | Amy Tan          |  69 |  5 | The Joy Luck Club                |       288 | Drama             |       16 |   104
 17 | Laura Esquivel   |  70 |  7 | Tita's Diary                     |       294 | Romance/Diary     |       17 |
 17 | Laura Esquivel   |  70 |  6 | Like Water for Chocolate         |       256 | Romance/Tragedy   |       17 |   105
 18 | Khaled Hosseini  |  55 |  9 | Kite Runner                      |       371 | Historical/Drama  |       18 |   106
 19 | Brit Bennett     |  31 | 10 | The Vanishing Half               |       352 | Historical/Drama  |       19 |   106
 20 | Lang Leav        |  40 | 11 | September Love                   |       224 | Romance           |       20 |   107
 20 | Lang Leav        |  40 | 14 | Love and Misadventure            |       176 | Romance           |       20 |   107
 21 | Colson Whitehead |  51 | 12 | The Nickel Boys                  |       224 | Historical        |       21 |   108
 22 | Paulo Coelho     |  73 | 13 | The Alchemist                    |       163 | Fantasy/Adventure |       22 |   103
 23 | clare pooley     |  49 | 15 | The Authenticity Project         |       384 | Romance           |       23 |   102
 24 | John Green       |     | 17 | Looking for Alaska               |       620 | Young Adult       |       24 |   100
 24 | John Green       |     | 16 | Paper Towns                      |       420 | Young adult       |       24 |   100
(17 rows)

spr2022adb35=>
```

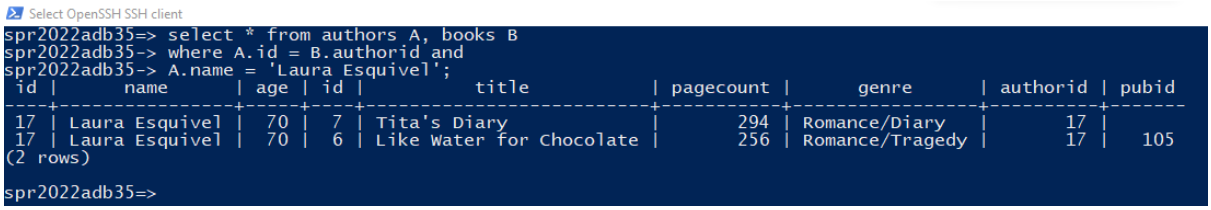
Cost = M + M*Pa*2

Cost for the above query becomes as follows: -

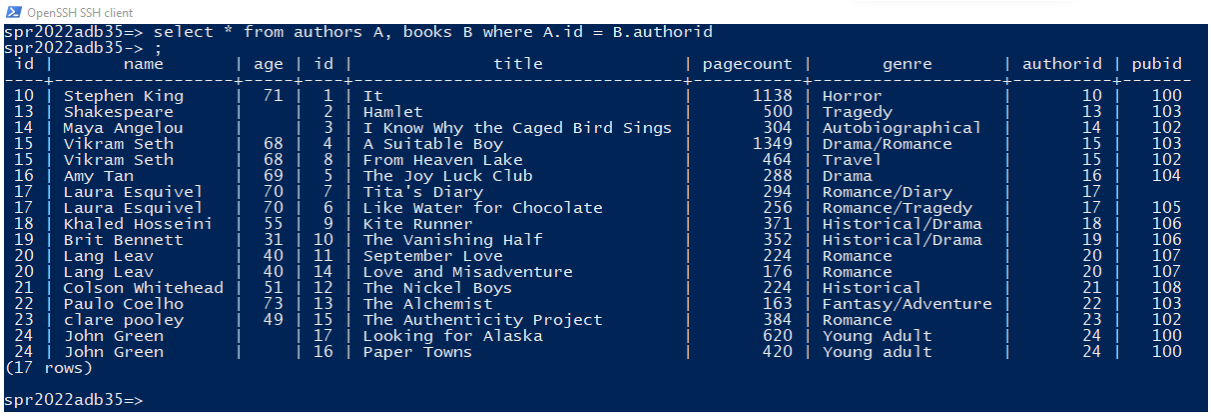
Cost = M + ((M*Pa) * cost of finding the matching rows

1000+(1000*100*2) = 200000 I/Os

Video 13.3



Video 14.1 (Sort-Merge)



Here, both the relations are sorted on the join attribute (authors.id and books.id) after the step of merge.

Now, as far as cost is concerned: -

Cost = sqrt(M) < BP and sqrt(N)< BP = 3*(M+N)

Cost = 3*(1000+500)

Cost = 4500 I/Os

Video 14.2 (External Merge-Sort)

Disk Based sort – Relation A

Input File = (3,4) , (6,2), (9,4) , (8,7) , (5,6) , (3,1) (2)

Sorted run: - (2,3,44,6,7,8,9) , (1,2,3,5,6)

Disk Based Sort – Relation B

Input File – (5,4) , (1,3) , (8,5) , (2,9) , (3,8) , (2,2) , (4)

Sorted Run : - (1,2,3,4,5,5,8,9) , (2,2,3,4,8)