CSC 244 Programming Assignment-I
BAG INTERSECTION
RAMYA VELLORE RAMESH
SAC ID:219123243

1.The description of the simulation of the memory and disk storage

Assuming Relation R and S are in disk,S has 10 tuples which is less than the memory(size=15),R has 20 tuples which is more than the size of the memory(size=15) .Relation S and R are assumed to be in two-dimensional array.Relation R contains more tuples than relation S and Relation R contains 3 Attributes and relation S contains 3 Attributes.(B(R) > M>B(S))

- 2-Dimensional arrays are used for both the relations R and S for disk storage.
- ArrayList is used as memory to store the block values of Relation R and S from the disk.
- HashMap is used to store the tuples of Relation S as a key-value pair.The tuple is stored as key and corresponding count is stored as value.If tuple is already present in hash map increment the count.
- Check if the tuples of Relation R is same as tuples of S,which is stored as key in hashmap.If the tuple is present and if its count is greater than 1,then decrement the count and add it to the output buffer.
- An ArrayList is used to store the intersection of tuples of Relation R and S to the output buffer.
- When the output buffer is full, an arraylist is used to store the common tuples from output buffer to output disk.

2.Example used to test the program

Relation R = {{1,1,1},{2,4,6},{2,4,6},{3,2,4},{21,26,17},{3,3,3},{7,8,6},{3,9,6},{2,5,9},
{3,7,8},{1,4,6},{11,13,15},{25,30,35},{8,9,10},{2,9,5},{6,11,17},{1,4,4},{0,2,5},{3,5,7},{1,5,9}};

Relation S = {{1,1,1},{2,4,6},{2,4,6},{3,2,4},{3,3,3},{3,9,6},{2,5,9},{1,8,9},{1,4,6},{3,2,4}}

3. The input and output of your program using this example. Input can be either hardcoded or from the command line.

Input is hardcoded.

Output:

```
Buffer contents after writing to Outputbuffer:
[1, 1, 1]
Buffer contents after writing to Outputbuffer:
[1, 1, 1]
[2, 4, 6]
Buffer contents after writing to Outputbuffer:
[1, 1, 1]
[2, 4, 6]
[2, 4, 6]
Buffer contents after writing to Outputbuffer:
```

```
[1, 1, 1]
[2, 4, 6]
[2, 4, 6]
[3, 2, 4]
Buffer contents after writing to Outputbuffer:
[1, 1, 1]
[2, 4, 6]
[2, 4, 6]
[3, 2, 4]
[3, 3, 3]
Buffer is full writing the buffer contents to disk:
[1, 1, 1]
[2, 4, 6]
[2, 4, 6]
[3, 2, 4]
[3, 3, 3]
Buffer contents after writing to Outputbuffer:
[3, 9, 6]
[2, 5, 9]
Buffer contents after writing to Outputbuffer:
[3, 9, 6]
[2, 5, 9]
[1, 4, 6]
The Bag Intersection of two Relations R and S
[1, 1, 1] [2, 4, 6] [2, 4, 6] [3, 2, 4] [3, 3, 3] [3, 9, 6] [2, 5, 9] [1, 4, 6]
```