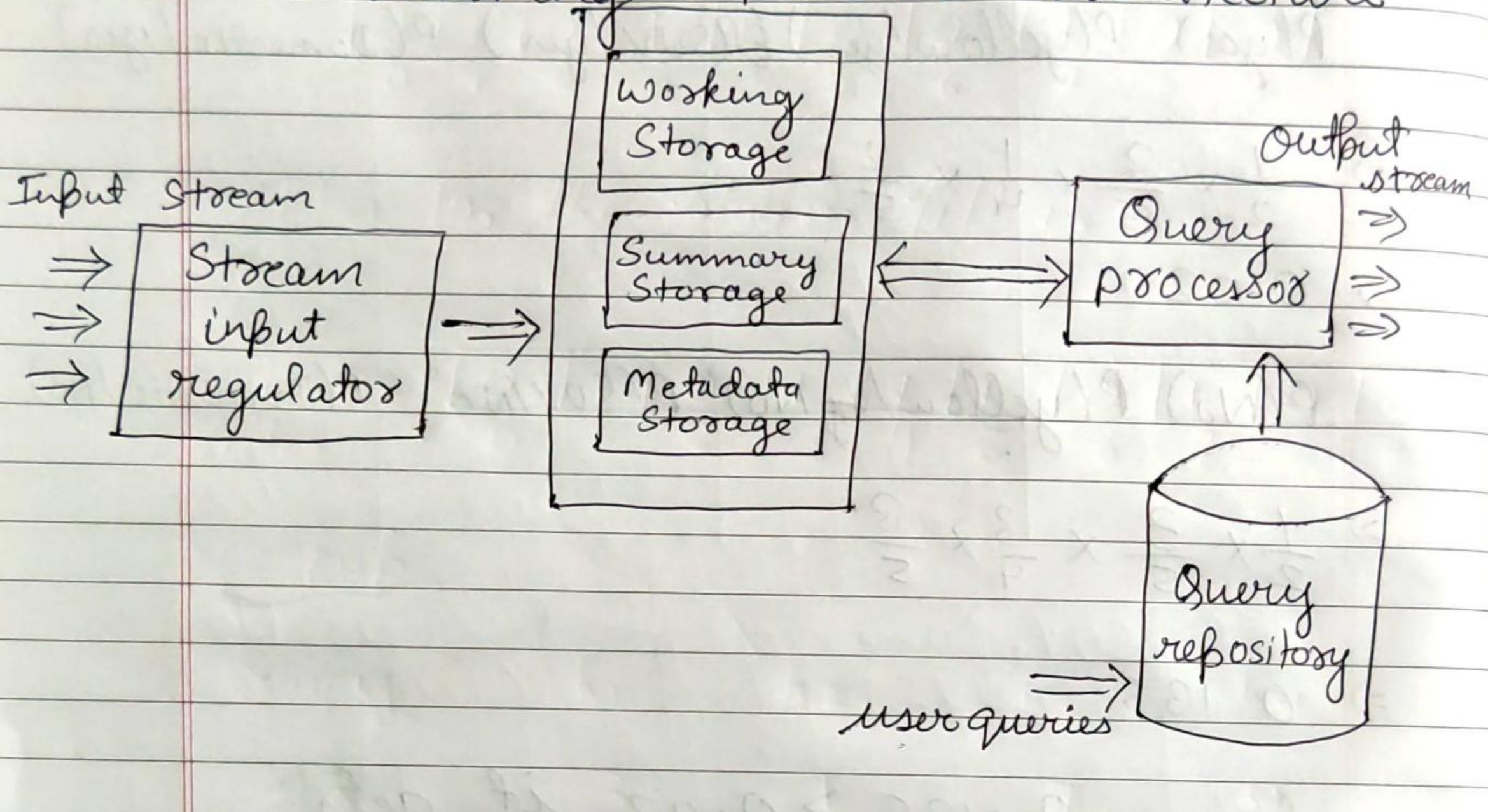
Ankit Raj 1906534

Answer2)

(i) The Working Of DSMS architecture



* The input buffer captures the streaming inputs. Optionally, an input monitor may collect various statics such as inter-arrival times or drop some incoming data in a controlled fashion (e.g. via random sampling) if the system cannot keep up.

* The working storage component temporarily stores recent portions of the stream and/or various summary data structures needed by queries.

* Local Storage may be used for metadata such as foreign key mapping.

Ankit Raj 1906534

* Continous queries are registered in the query repository and ~~connected~~ converted into execution plans; similar queries may be grouped for shared processing.

* The query processor may communicate with the input monitor and may change the query plans in response to changes in the workload and the input rates.

* finally, results may streamed to users, to alerting or event-processing applications, or to a SDW for permanent storage and further analysis.

(ii) $h_1(x) = 3x + 3 \mod 6$
$h_2(x) = 2x + 9 \mod 2$
$h_3(x) = 3x + 7 \mod 8$
$h_4(x) = 2x + 3 \mod 5$

Size = 10.

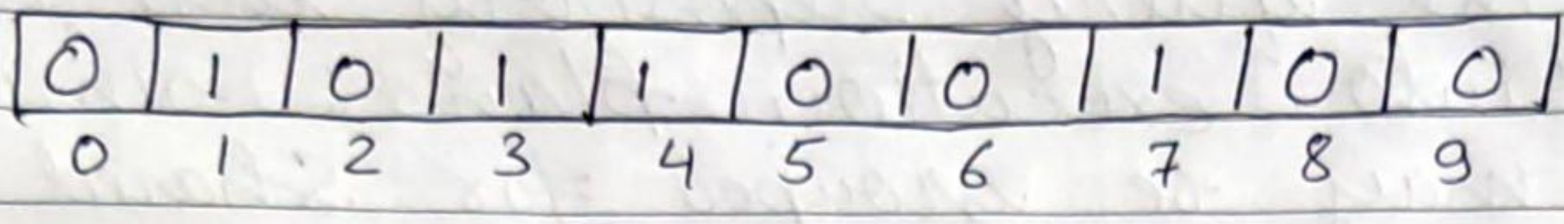
Initial =

0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0

Insert(x)	$h_1(x)$	$h_2(x)$	$h_3(x)$	$h_4(x)$
8	3	1	7	4
10	3	1	5	3

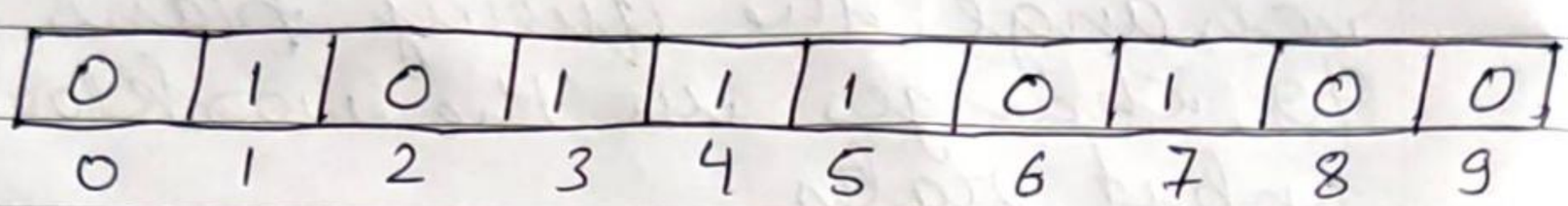
Ankit Raj 1906534

After 8, the bloom filter



After 10, the bloom filter,

final bloom filter =



Lookup

Query	h_1	h_2	h_3	h_4
48	3	1	7	4

∵ Since, 1 is present at 3rd, 1st, 7th and 4th position of bloom filter array, hence, it is FALSE POSITIVE

7	0	1	4	2

∵ Since, There is no 1 on the 0th and 2nd position.

∴ 7 is not present in the set.