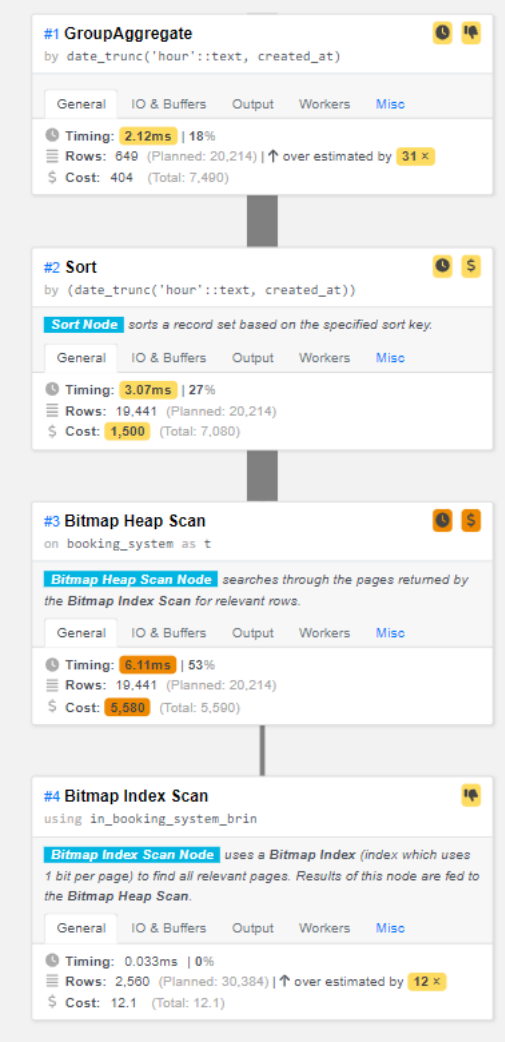
Lab 6 Week 6 - Databases Lab Index Types - Part TWO

Question 1 – without an index

This is the query on which the performance is being checked.

```
EXPLAIN ANALYSE
SELECT date_trunc('hour', created_at), avg(count)
FROM dbweek6.booking_system t
WHERE created_at BETWEEN '2021-02-01' AND '2021-02-28'
GROUP BY 1 ORDER BY 1;
```

This is the result of this performance check.



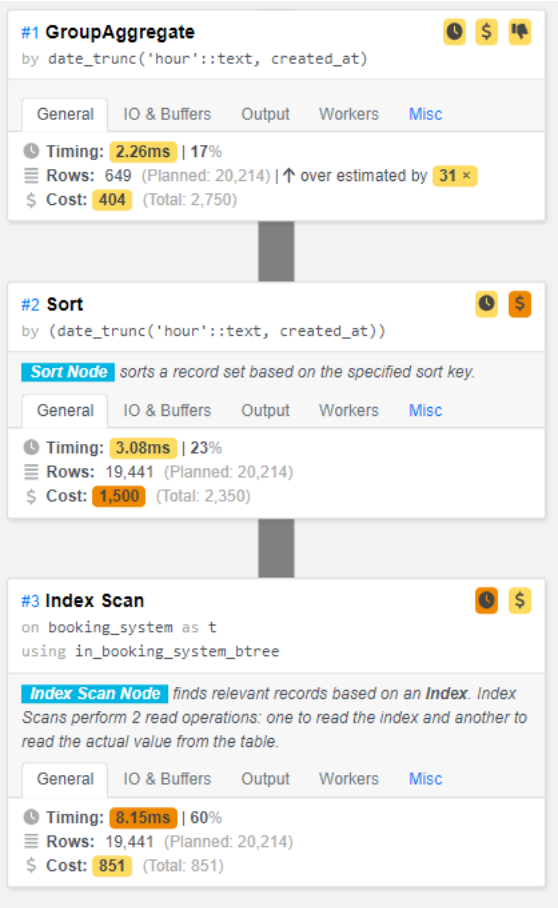
Without the index, the execution time on this query is 11.5ms. The planning time on this was 0.291ms. the cost was the most expensive on the bitmap heap scan at node three, which is 5,550 and the time on this was the most, 6.11ms. The cost was also high at node two, 1,500. The time on this was 3.07ms. The time was also high at node one which was 2.12ms and the rows were overestimated here by 31 times. The rows were overestimated at the final node, bitmap index scan. It was overestimated by 12 times.

Question 1 – Index

The index created was as below

```
CREATE INDEX in_booking_system_btree ON dbweek6.booking_system(created_at);
```

The performance of the query after the index is shown.



The execution time on this is 13.7ms. This is a bit slower than the query running without an index. The cost was the most expensive on the second node which is the sort, 1,500. The last query check without the index was more expensive so the expense has reduced on this query with an index. The cost was also high on the first node, the group aggregate and the final node, the index scan, 404, 851 respectively. The time on the final node was 8.15ms. The query without the index has a node that ran 6.11ms. Both the group aggregate and the sort had a high time of 2.26ms and 3.08ms respectively.

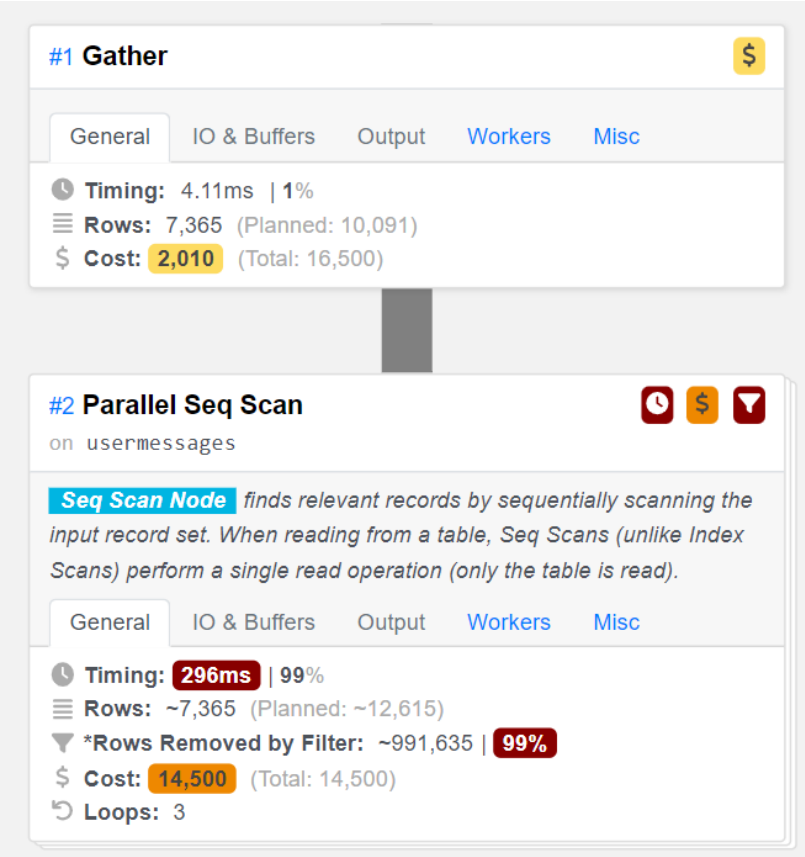
The size on this index was 13 mb.

Question 2 – without an index

This is the query

```
EXPLAIN ANALYSE
SELECT message FROM dbweek6.usermessages
WHERE message ilike '%aeb%';
```

This is the performance of the query



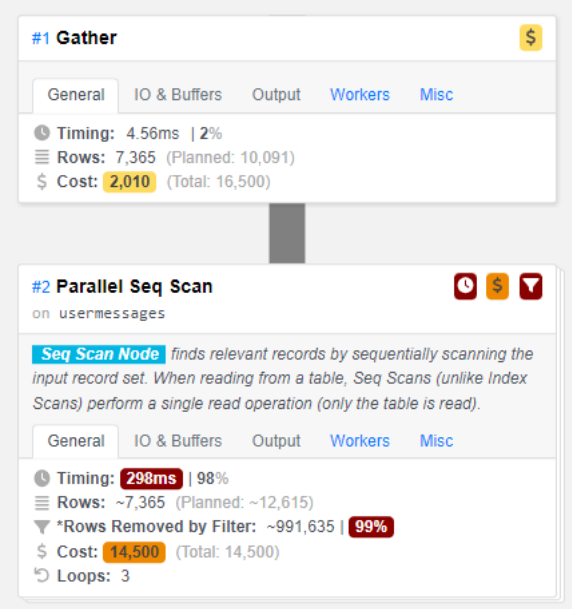
The execution time was 301ms. The second node cost was at 14,500 and the time on this was 296ms. The first node, the gather, has a cost of 2,010. The rows removed by the filter were about 99%.

Question 2 – Index

The index of this query is

```
--Index
CREATE INDEX index_messages_btree on dbweek6.usermessages(message);
```

The performance of this index was



The execution time on this was 303ms. This was a little slower then the first query. The cost on the second node here is 14,500. The cost was the same in the last query. The time on this second node was 298ms. This was slightly slower than the last query without the index. The time on that was 296ms. The cost was the same on the first node for the both of the queries.

The size on this index was 56mb. This is quite heavy as the b-tree indexes take up a lot of storage and is heavier than the last index.