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1. Project Milestone 1

2. Project Milestone 2

3. Project Milestone 3

3.1 Indexing and Querying Optimization

3.1.1 Queries and SQL script to create index

```
Create Index btree on Person(firstname);

Select * from Person where firstname like 'nu%q%';

create table SportEvent(
  EventDate Date,
  StartTime Date,
  Location varchar(30),
  EndTime Date,
  Organizer varchar(30),
  MainSponsor varchar(50) not null,
  Description varchar(100),

  CONSTRAINT PKSportEvent PRIMARY KEY (EventDate, StartTime, Location),
  CONSTRAINT FKLocation FOREIGN KEY(Location) REFERENCES Venue(Location),
  CONSTRAINT FKOrganizer FOREIGN KEY(Organizer) REFERENCES Organizer(Username)
)cluster hashCluster(Organizer);

Create cluster hashCluster (
  Organizer varchar(30))
  size 256 HASHKeys 100;

Select * from SportEvent where organizer = 'umtbverr90633';
```

3.1.2 Why was it chosen?

3.1.3 Performance Measurement

B-Tree Index Before Implement

```

1 Plan hash value: 1493655343
2
3 -----
4 | Id | Operation | Name | Rows | Bytes | Cost (%CPU) | Time
5 -----
6 | 0 | SELECT STATEMENT | | 124 | 8556 | 308 (1) | 00:00:01
7 |* 1 | TABLE ACCESS FULL | PERSON | 124 | 8556 | 308 (1) | 00:00:01
8 -----
9
10 Predicate Information (identified by operation id):
11 -----
12
13 1 - filter("FIRSTNAME" LIKE 'nu%q%')

```

B-Tree Index After Implement

```

1 Plan hash value: 4105735724
2
3 -----
4 | Id | Operation | Name | Rows | Bytes | Cost (%CPU) | Time |
5 -----
6 | 0 | SELECT STATEMENT | | 124 | 8556 | 126 (0) | 00:00:01 |
7 | 1 | TABLE ACCESS BY INDEX ROWID BATCHED | PERSON | 124 | 8556 | 126 (0) | 00:00:01 |
8 |* 2 | INDEX RANGE SCAN | BTREE | 124 | | 2 (0) | 00:00:01 |
9 -----
10
11 Predicate Information (identified by operation id):
12 -----
13
14 2 - access("FIRSTNAME" LIKE 'nu%q%')
15 filter("FIRSTNAME" LIKE 'nu%q%')

```

Hash-Cluster Index Before Implement

```
1 Plan hash value: 1484609831
2
3 -----
4 | Id | Operation          | Name          | Rows | Bytes | Cost (%CPU)| Time     |
5 -----
6 |  0 | SELECT STATEMENT    |               |  1000 | 74000 |    308   (1)| 00:00:01 |
7 |*  1 | TABLE ACCESS FULL | SPORTEVENT    |  1000 | 74000 |    308   (1)| 00:00:01 |
8 -----
9
10 Predicate Information (identified by operation id):
11 -----
12
13    1 - filter("ORGANIZER"='umtbverr90633')
```

Hash-Cluster Index After Implement

```
1 Plan hash value: 4210168801
2
3 -----
4 | Id | Operation          | Name          | Rows | Bytes | Cost (%CPU)| Time     |
5 -----
6 |  0 | SELECT STATEMENT    |               |  1317 | 180K |      1   (0)| 00:00:01 |
7 |*  1 | TABLE ACCESS HASH | SPORTEVENT    |  1317 | 180K |      1   (0)| 00:00:01 |
8 -----
9
10 Predicate Information (identified by operation id):
11 -----
12
13    1 - access("ORGANIZER"='umtbverr90633')
14
15 Note
16 -----
17    - dynamic statistics used: dynamic sampling (level=2)
```

3.1.4 Discussion of Performance Measurement