Table of Contents

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

```sql
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

4. COMPX323-22A Project Checklist

Kevin Han: (Contributions %)
Bedir Asici: (Contributions %)
Tetsusaburo Kato: (Contributions %)

	Project Milestone 1	
1	1a. Clear structure of milestone material, including headings, sections, readable screenshots with captions. This checklist should be included and filled in.	
2	1b. Database application description.	
6	1c. Revised ER Diagram.	
	Project Milestone 2	
4	2. Relational schema for your ER Diagram.	
6	3. Table definitions in Oracle, include SQL script which creates relevant tables etc.	
3	4a. Dataset: small (screenshots of dataset successfully loaded).	

4	4b. Dataset: large.
	   i. Description of how data was created (incl code if relevant)
	   ii. Screenshot of large dataset successfully loaded (use count).	

	5. Application:
	   i. Functionality to display and modify the database.
	   ii. System should be error proof with appropriate user messages.
	   iii. Screenshots showing functionality, with appropriate descriptions.	

	Project Milestone 3	

	6. Indexing and Query Optimization:
	   i. Show queries used and SQL script that creates the indexes.
	   ii. Discussion of why these indexes were chosen to optimize the queries.
	   iii. Performance measurements with and without indexes (with query plan).
	   iv. Discussion of performance measurements.	

	7. Application: extend with MongoDB.
	   i. MongoDB version of database (show structure) + small dataset (screenshot).
	   ii. Explanation of the data structures you have chosen and comparison to your SQL version.
	   iii. Core functionality of application in second tab/area, using MongoDB (screenshots).	