VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.

LAB REPORT

on

BIG DATA ANALYTICS
(20CS6PEBDA)

Submitted by

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in partial fulfillment for the award of the degree of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

B.M.S. COLLEGE OF ENGINEERING

(Autonomous Institution under VTU)

BENGALURU-560019

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B. M. S. College of Engineering,

Bull Temple Road, Bangalore 560019

(Affiliated To Visvesvaraya Technological University, Belgaum)

Department of Computer Science and Engineering

CERTIFICATE

This is to certify that the Lab work entitled "**BIG DATA ANALYTICS**" carried out by **Akash Shrivastava(1BM19CS231),** who is a bonafide student of **B. M. S. College of Engineering.** It is in partial fulfillment for the award of **Bachelor of Engineering in Computer Science and Engineering** of the Visvesvaraya Technological University, Belgaum during the year 2022. The Lab report has been approved as it satisfies the academic requirements in respect of a **Big Data Analytics - (20CS6PEBDA)**work prescribed for the said degree.

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Course Outcome

CO1	Apply the concept of NoSQL, Hadoop or Spark for a given task
CO2	Analyze the Big Data and obtain insight using data analytics mechanisms.
CO3	Design and implement Big data applications by applying NoSQL, Hadoop or Spark

Program 1: Employee Database using Cassandra

1. Create a keyspace by name Employee

CREATE KEYSPACE employee WITH REPLICATION={ 'class' : 'SimpleStrategy', 'replication_factor' : 1};

USE employee;

2. Create a column family by name Employee-Info with attributes Emp_Id Primary Key, Emp_Name, Designation, Date_of_Joining, Salary, Dept_Name

create table employee_info(emp_id int PRIMARY KEY, emp_name text, designation text, date_of_joining timestamp, salary double, dept_name text);

3. Insert the values into the table in batch

BEGIN BATCH

INSERT INTO employee_info(emp_id,emp_name,designation,date_of_joining,salary,dept_name) VALUES(100,'TANYA','MANAGER','2020-09-11',30000,'TESTING')

... INSERT INTO employee_info(emp_id,emp_name,designation,date_of_joining,salary,dept_name) VALUES(111,'SRIRAM','ASSOCIATE','2020-06-22',25000,'DEVELOPING')

... INSERT INTO employee_info(emp_id,emp_name,designation,date_of_joining,salary,dept_name) VALUES(121,'SHIVA','MANAGER','2020-03-30',35000,'HR')

... APPLY BATCH;

SELECT * FROM employee_info;

4. Update Employee name and Department of Emp-Id 121

UPDATE employee_info SET emp_name = 'SHAAN' WHERE emp_id = 121; SELECT * FROM employee_info;

5. Alter the schema of the table Employee_Info to add a column Projects which stores a set of Projects done by the corresponding Employee.

ALTER TABLE employee_info ADD projects text;

6. Update the altered table to add project names.

UPDATE employee_info SET projects = 'chat app' WHERE emp_id = 111;

UPDATE employee_info SET projects = 'campusx' WHERE emp_id = 121;

UPDATE employee_info SET projects = 'canteen app' WHERE emp_id = 100;

SELECT * FROM employee_info;

7.Create a TTL of 15 seconds to display the values of Employees.

INSERT INTO
employee_info(emp_id,emp_name,designation,date_of_joining,salary,dept_name)
VALUES(110,'SAM','ASSOCIATE','2020-01-11',33000,'TESTING') USING TTL 15;

SELECT TTL(emp_name) from employee_info WHERE emp_id = 110; SELECT *
FROM employee_info;

Program 2: Library Database using Cassandra

1.Create a keyspace by name Library

CREATE KEYSPACE library WITH REPLICATION={ 'class' : 'SimpleStrategy', 'replication_factor' : 1};

USE library;

2. Create a column family by name Library-Info with attributes Stud_Id Primary Key, Counter_value of type Counter, Stud_Name, Book-Name, Book-Id, Date_of_issue

create table library_info(stud_id int, counter_value Counter, stud_name text,book_name text, date_of_issue timestamp, book_id int, PRIMARY KEY(stud_id,stud_name,book_name,date_of_issue,book_id));

3. Insert the values into the table in batch

UPDATE library_info SET counter_value = counter_value + 1 WHERE stud_id = 111 and stud_name = 'SAM' and book_name = 'ML' and date_of_issue = '2020-10-11'and book_id = 200; UPDATE library_info SET counter_value = counter_value + 1 WHERE stud_id = 112 and stud_name = 'SHAAN' and book_name = 'BDA' and date_of_issue = '2020-09-21'and book_id = 300;

UPDATE library_info SET counter_value = counter_value + 1 WHERE stud_id = 113 and stud_name = 'AYMAN' and book_name = 'OOMD' and date_of_issue = '2020-04-01'and book_id = 400;

SELECT * FROM library_info;

4. Display the details of the table created and increase the value of the counter

UPDATE library_info SET counter_value = counter_value + 1 WHERE stud_id = 112 and stud_name = 'SHAAN' and book_name = 'BDA' and date_of_issue = '2020-09-21'and book_id = 300;

5. Write a query to show that a student with id 112 has taken a book "BDA" 2 times. SELECT * FROM library_info WHERE stud_id = 112; **6. Export the created column to a csv file**

COPY Library_Info(Stud_Id,Stud_Name,Book_Name,Book_Id,Date_Of_Issue,Counter_value) TO 'e:\libraryInfo.csv';

7. Import a given csv dataset from local file system into Cassandra column family

create table library_info2(stud_id int, counter_value Counter, stud_name text,book_name text, date_of_issue timestamp, book_id int, PRIMARY KEY(stud_id,stud_name,book_name,date_of_issue,book_id));

```
COPY library_info2(stud_id,stud_name,book_name,book_id,date_of_issue,counter _value)
FROM 'e:\libraryInfo.csv';
```

Program 3 : Student MongoDB Program

```
> use mySTUD;
switched to db mySTUD
> db.getCollectionNames()
[ ]
> db.createCollection("Student");
{ "ok" : 1 }
> db.getCollectionNames()
[ "Student" ]
> db.Student.insert({_id: 1, Name:"John", USN: "1B22CS001",Semester: 6,Dept_name: "CSE", CGPA: 9.6, Hobbies : ["Reading","Gardening"]})
WriteResult({ "nInserted" : 1 })
> db.Student.insert({_id: 4, Name:"Arthur", USN: "1B22CS041",Semester: 6,Dept_name: "CSE", CGPA: 8.6, Hobbies : ["Novel Reading"]})
WriteResult({ "nInserted" : 1 })
> db.Student.insert({_id: 3, Name:"Horris", USN: "1B22EE021",Semester: 5,Dept_name: "EEE", CGPA: 9.3, Hobbies : ["eSports"]})
WriteResult({ "nInserted" : 1 })
> db.Student.insert({_id: 7, Name:"Hritik", USN: "1B22CS014",Semester: 5,Dept_name: "CSE", CGPA: 8.7, Hobbies : ["Reading"]})
WriteResult({ "nInserted" : 1 })
> db.Student.find().pretty()
{
        "_id" : 1,
        "Name" : "John",
        "USN" : "1B22CS001",
        "Semester" : 6,
        "Dept_name" : "CSE",
        "CGPA" : 9.6,
        "Hobbies" : [
```

```
            "Reading",
            "Gardening"
        ]
}
{
        "_id" : 4,
        "Name" : "Arthur",
        "USN" : "1B22CS041",
        "Semester" : 6,
        "Dept_name" : "CSE",
        "CGPA" : 8.6,
        "Hobbies" : [
            "Novel Reading"
        ]
}
{
        "_id" : 3,
        "Name" : "Horris",
        "USN" : "1B22EE021",
        "Semester" : 5,
        "Dept_name" : "EEE",
        "CGPA" : 9.3,
        "Hobbies" : [
            "eSports"
        ]
}
{
        "_id" : 7,
```

```
        "Name" : "Hritik",
        "USN" : "1B22CS014",
        "Semester" : 5,
        "Dept_name" : "CSE",
        "CGPA" : 8.7,
        "Hobbies" : [
                "Reading"
        ]
}

> db.Student.update({_id: 3, Name:"Horris", USN: "1B22EE021",Semester:
5,Dept_name: "EEE", CGPA: 9.3},{$set:{Hobbies:"Skating"}},{upset:true});

> db.Student.find().pretty()
{
        "_id" : 1,
        "Name" : "John",
        "USN" : "1B22CS001",
        "Semester" : 6,
        "Dept_name" : "CSE",
        "CGPA" : 9.6,
        "Hobbies" : [
                "Reading",
                "Gardening"
        ]
}
{
        "_id" : 4,
        "Name" : "Arthur",
```

```
        "USN" : "1B22CS041",
        "Semester" : 6,
        "Dept_name" : "CSE",
        "CGPA" : 8.6,
        "Hobbies" : [
                "Novel Reading"
        ]
}
{
        "_id" : 3,
        "Name" : "Horris",
        "USN" : "1B22EE021",
        "Semester" : 5,
        "Dept_name" : "EEE",
        "CGPA" : 9.3,
        "Hobbies" : "Skating"
}
{
        "_id" : 7,
        "Name" : "Hritik",
        "USN" : "1B22CS014",
        "Semester" : 5,
        "Dept_name" : "CSE",
        "CGPA" : 8.7,
        "Hobbies" : [
                "Reading"
        ]
}
```

```
> db.Student.find({},{StudName:1,Semester:1,_id:0}); {
"Semester" : 6 }
{ "Semester" : 6 }
{ "Semester" : 5 }
{ "Semester" : 5 }
> db.Student.find({},{Name:1,Semester:1,_id:0});
{ "Name" : "John", "Semester" : 6 }
{ "Name" : "Arthur", "Semester" : 6 }
{ "Name" : "Horris", "Semester" : 5 }
{ "Name" : "Hritik", "Semester" : 5 }

> db.Student.find({Semester:{$eq:5}}).pretty();
{
        "_id" : 3,
        "Name" : "Horris",
        "USN" : "1B22EE021",
        "Semester" : 5,
        "Dept_name" : "EEE",
        "CGPA" : 9.3,
        "Hobbies" : "Skating"
}
{
        "_id" : 7,
        "Name" : "Hritik",
        "USN" : "1B22CS014",
        "Semester" : 5,
        "Dept_name" : "CSE",
        "CGPA" : 8.7,
```

```
        "Hobbies" : [
                "Reading"
        ]
}
> db.Student.count();
4
> db.Student.find().sort({Name:-1}).pretty();
{
        "_id" : 1,
        "Name" : "John",
        "USN" : "1B22CS001",
        "Semester" : 6,
        "Dept_name" : "CSE",
        "CGPA" : 9.6,
        "Hobbies" : [
                "Reading",
                "Gardening"
        ]
}
{
        "_id" : 7,
        "Name" : "Hritik",
        "USN" : "1B22CS014",
        "Semester" : 5,
        "Dept_name" : "CSE",
        "CGPA" : 8.7,
        "Hobbies" : [
                "Reading"
```

```
        ]
}
{
        "_id" : 3,
        "Name" : "Horris",
        "USN" : "1B22EE021",
        "Semester" : 5,
        "Dept_name" : "EEE",
        "CGPA" : 9.3,
        "Hobbies" : "Skating"
}
{
        "_id" : 4,
        "Name" : "Arthur",
        "USN" : "1B22CS041",
        "Semester" : 6,
        "Dept_name" : "CSE",
        "CGPA" : 8.6,
        "Hobbies" : [
                "Novel Reading"
        ]
}
```


```
(base) bmsce@bmsce-Precision-T1700:~$ mongoexport --host localhost --db mySTUD
--collection Student --type=csv --fields="_id,Name,USN,Semester,Dept_name,CGPA,Hobbies" --
out /home/bmsce/Desktop/output.csv
2022-05-06T12:13:37.350+0530    connected to: localhost
2022-05-06T12:13:37.351+0530    exported 4 records
(base) bmsce@bmsce-Precision-T1700:~$ mongo
```

MongoDB shell version v3.6.8

connecting to: mongodb://127.0.0.1:27017

Implicit session: session { "id" : UUID("aabd8226-3ced-43d4-97fb-b0d55827849c") }

MongoDB server version: 3.6.8

Server has startup warnings:

2022-05-06T11:28:08.073+0530 I STORAGE [initandlisten]

2022-05-06T11:28:08.073+0530 I STORAGE [initandlisten] ** WARNING: Using the XFS filesystem is strongly recommended with the WiredTiger storage engine

2022-05-06T11:28:08.073+0530 I STORAGE [initandlisten] ** See

http://dochub.mongodb.org/core/prodnotes-filesystem 2022-05-

06T11:28:13.281+0530 I CONTROL [initandlisten]

2022-05-06T11:28:13.281+0530 I CONTROL [initandlisten] ** WARNING: Access control is not enabled for the database.

2022-05-06T11:28:13.281+0530 I CONTROL [initandlisten] ** Read and write access to data and configuration is unrestricted.

2022-05-06T11:28:13.281+0530 I CONTROL [initandlisten]

> use mySTUD;

switched to db mySTUD

> db.Student.update({_id:4},{$set:{Location:”Network”}})

2022-05-06T12:16:35.289+0530 E QUERY [thread1] SyntaxError: illegal character @(shell):1:42

> db.Student.update({_id:4},{$set:{Location:"Network"}})

WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })

> db.Student.find().pretty()

{

"_id" : 1,

"Name" : "John",

"USN" : "1B22CS001",

"Semester" : 6,

"Dept_name" : "CSE",

```
        "CGPA" : 9.6,
        "Hobbies" : [
                "Reading",
                "Gardening"
        ]
}
{
        "_id" : 4,
        "Name" : "Arthur",
        "USN" : "1B22CS041",
        "Semester" : 6,
        "Dept_name" : "CSE",
        "CGPA" : 8.6,
        "Hobbies" : [
                "Novel Reading"
        ],
        "Location" : "Network"
}
{
        "_id" : 3,
        "Name" : "Horris",
        "USN" : "1B22EE021",
        "Semester" : 5,
        "Dept_name" : "EEE",
        "CGPA" : 9.3,
        "Hobbies" : "Skating"
}
{
```

```
        "_id" : 7,
        "Name" : "Hritik",
        "USN" : "1B22CS014",
        "Semester" : 5,
        "Dept_name" : "CSE",
        "CGPA" : 8.7,
        "Hobbies" : [
                "Reading"
        ]
}
> db.Student.find().sort({Name:1}).pretty();
{
        "_id" : 4,
        "Name" : "Arthur",
        "USN" : "1B22CS041",
        "Semester" : 6,
        "Dept_name" : "CSE",
        "CGPA" : 8.6,
        "Hobbies" : [
                "Novel Reading"
        ],
        "Location" : "Network"
}
{
        "_id" : 3,
        "Name" : "Horris",
        "USN" : "1B22EE021",
        "Semester" : 5,
```

```
        "Dept_name" : "EEE",
        "CGPA" : 9.3,
        "Hobbies" : "Skating"
}
{
        "_id" : 7,
        "Name" : "Hritik",
        "USN" : "1B22CS014",
        "Semester" : 5,
        "Dept_name" : "CSE",
        "CGPA" : 8.7,
        "Hobbies" : [
                "Reading"
        ]
}
{
        "_id" : 1,
        "Name" : "John",
        "USN" : "1B22CS001",
        "Semester" : 6,
        "Dept_name" : "CSE",
        "CGPA" : 9.6,
        "Hobbies" : [
                "Reading",
                "Gardening"
        ]
}
```