

ADBMS PROJECT SUBMISSION REPORT

Submitted to:

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Introduction

ClassroomPlus is an application program where users can create classrooms, join classrooms and perform CRUD operations on classrooms.

Project Outline

Database: classroomPlus

Collections: Users, Classes

Structure of Collections :

- *Classes*
 - *classid*
 - *teacherid*
 - *studentsId List*

- *Users*
 - *id*
 - *username*
 - *password*
 - *role*
 - *age*
 - *location*
 - *classes*

DataBase used

MongoDB Atlas

The Easiest Way to Run MongoDB

Deploy a MongoDB database in the cloud with just a few clicks. With best-in-class automation and proven practices that guarantee high availability, elastic scalability, and optimal performance, MongoDB Atlas is the easiest way to try out the database for free on AWS, Azure, or Google Cloud.

- Secure from the start
- Fully managed backups
- Comprehensive monitoring and customizable alerts
- Easily migrate existing deployments with minimal downtime
- Cloud-only features, like real-time triggers and global clusters

Query Scenarios and Implementation Details

1) Start Mongo Server in Terminal

```
sujith@sujith-HP-Pavilion-Notebook:~$ service mongod status
● mongod.service - An object/document-oriented database
   Loaded: loaded (/lib/systemd/system/mongod.service; disabled; vendor preset: enabled)
   Active: inactive (dead)
     Docs: man:mongod(1)
sujith@sujith-HP-Pavilion-Notebook:~$ sudo service mongod start
[sudo] password for sujith:
sujith@sujith-HP-Pavilion-Notebook:~$ service mongod status
● mongod.service - An object/document-oriented database
   Loaded: loaded (/lib/systemd/system/mongod.service; disabled; vendor preset: enabled)
   Active: active (running) since Fri 2020-05-22 10:42:17 IST; 3s ago
     Docs: man:mongod(1)
  Main PID: 3020 (mongod)
    Tasks: 1 (limit: 9345)
   Memory: 36.8M
    CGroup: /system.slice/mongod.service
            └─3020 /usr/bin/mongod --unixSocketPrefix=/run/mongod --config /etc/mongod.conf

May 22 10:42:17 sujith-HP-Pavilion-Notebook systemd[1]: Started An object/document-oriented database.
```

2) Start Mongo Shell

```
sujith@sujith-HP-Pavilion-Notebook:~$ mongo
MongoDB shell version v3.6.8
connecting to: mongod://127.0.0.1:27017
Implicit session: session { "id" : UUID("df26a154-5aee-43bf-bb15-7f8093883a82") }
MongoDB server version: 3.6.8
Server has startup warnings:
2020-05-22T14:51:48.968+0530 I STORAGE [initandlisten]
2020-05-22T14:51:48.968+0530 I STORAGE [initandlisten] ** WARNING: Using the XFS file
e
2020-05-22T14:51:48.968+0530 I STORAGE [initandlisten] ** See http://doch
2020-05-22T14:51:52.602+0530 I CONTROL [initandlisten]
2020-05-22T14:51:52.602+0530 I CONTROL [initandlisten] ** WARNING: Access control
2020-05-22T14:51:52.602+0530 I CONTROL [initandlisten] ** Read and write
2020-05-22T14:51:52.602+0530 I CONTROL [initandlisten]
> |
```

3) View databases in the Mongo Shell

```
> show dbs
admin          0.000GB
classroomPlus 0.000GB
config         0.000GB
local          0.000GB
test           0.000GB
```

4) Switch to ClassroomPlus Database

```
> use classroomPlus
switched to db classroomPlus
```

5) View Collections Present in Database

```
> db.getCollectionNames()
[ "classes", "users" ]
```

6) Create Two Variables to access those two collections

```
> usersDB=db["users"]
classroomPlus.users
> classesDB=db["classes"]
classroomPlus.classes
```

7) Check If Collections contain any documents.

```
> usersDB.find()
> classesDB.find()
```

8) Run Application Program

(<https://github.com/sujithsagar217/classroomPlus>)

```
sujith@sujith-HP-Pavilion-Notebook:~$ cd Academics/6sixth_semester/ADBMS/p
roject_A/pyprograms/
sujith@sujith-HP-Pavilion-Notebook:~/Academics/6sixth_semester/ADBMS/proje
ct_A/pyprograms$ python3 test_run.py
```

9) Primary Menu

```
Menu
1) Login
2) Signup
3) Exit
Select your Choice :|
```

10) User Signup

```
Menu
1) Login
2) Signup
3) Exit
Select your Choice :2
Enter UserName :Sujith
Enter Password :sujith
Enter your role student or teacher :teacher
Enter Your Age :28
Enter your Location :AP
signing up.....
signup successful
Now Login With Your Credentials
```

11) User Data Updated in Database. We can check that in mongo shell in parallel.

```
> usersDB.find()
{ "_id" : ObjectId("5ec7b44a983fba0265a80005"), "user_name" : "Sujith",
"password" : "sujith", "age" : 28, "role" : "teacher", "classes" : [ ],
"location" : "AP" }
```

12) Login

```
Menu
1) Login
2) Signup
3) Exit
Select your Choice :1
Enter UserName :Sujith
Enter password :sujith
Password Match
Login Success!!!
```

13) Teacher Menu

```
Menu
1) View Profile
2) Create a Class
3) View Created Classes
4) Delete a Class
5) Logout
Select your Choice :|
```

14) *View profile*

```
Menu
1) View Profile
2) Create a Class
3) View Created Classes
4) Delete a Class
5) Logout
Select your Choice :1
Your Profile
{'_id': ObjectId('5ec7b44a983fba0265a80005'), 'user_name': 'Sujith', 'password': 'sujith', 'age': 28, 'role': 'teacher', 'classes': [], 'location': 'AP'}
*****
***
```

15) Create a Classroom

```
Menu
1) View Profile
2) Create a Class
3) View Created Classes
4) Delete a Class
5) Logout
Select your Choice :2
Enter Subject of the Classroom :Dbms
Enter Code of the Classroomdbms123
Code Accepted
Updated Profile
Your Profile
{'_id': ObjectId('5ec7b44a983fba0265a80005'), 'user_name': 'Sujith', 'password': 'sujith', 'age': 28, 'role': 'teacher', 'classes': ['dbms123'], 'location': 'AP'}
```

16) Reflection of the above changes in database

```
> usersDB.find()
{ "_id" : ObjectId("5ec7b44a983fba0265a80005"), "user_name" : "Sujith",
"password" : "sujith", "age" : 28, "role" : "teacher", "classes" : [ "dbms123" ], "location" : "AP" }
> classesDB.find()
{ "_id" : ObjectId("5ec7b507983fba0265a80006"), "class_code" : "dbms123",
"subject" : "Dbms", "teacherID" : ObjectId("5ec7b44a983fba0265a80005"),
"studentsIDs" : [ ] }
```

17)View Created classes

```
Menu
1) View Profile
2) Create a Class
3) View Created Classes
4) Delete a Class
5) Logout
Select your Choice :3
List of Classes Created
dbms123
```

18) Student Signup and Login

[illegible]

19) Student Menu

```
Menu
1) View Profile
2) Join a Class
3) View Joined Classes
4) Leave a Class
5) Logout
Select your Choice :|
```


20) Reflection of above changes in Database

```
> usersDB.find()
{ "_id" : ObjectId("5ec7b44a983fba0265a80005"), "user_name" : "Sujith",
  "password" : "sujith", "age" : 28, "role" : "teacher", "classes" : [ "dbms123" ], "location" : "AP" }
{ "_id" : ObjectId("5ec7b5b1983fba0265a80007"), "user_name" : "Rakesh",
  "password" : "rakesh", "age" : 18, "role" : "student", "classes" : [ ],
  "location" : "Delhi" }
> |
```

21) Student Joins a classroom. A Student can join a class if and only if he/she has Classroom Code which can be Shared by teacher.

```
Menu
1) View Profile
2) Join a Class
3) View Joined Classes
4) Leave a Class
5) Logout
Select your Choice :2
Enter Code of the Classroom you want to join :dbms123
Classroom Found!!
Updated Class Database
Updated User Profile
Your Profile
{'_id': ObjectId('5ec7b5b1983fba0265a80007'), 'user_name': 'Rakesh', 'password': 'rakesh', 'age': 18, 'role': 'student', 'classes': ['dbms123'], 'location': 'Delhi'}
```

22) Student leaves a class

```
Menu
1) View Profile
2) Join a Class
3) View Joined Classes
4) Leave a Class
5) Logout
Select your Choice :4
Enter Code of the Classroom you want to leave :dbms123
Updated Class Database
Updated User Profile
Your Profile
{'_id': ObjectId('5ec7b5b1983fba0265a80007'), 'user_name': 'Rakesh', 'password': 'rakesh', 'age': 18, 'role': 'student', 'classes': [], 'location': 'Delhi'}
```

23) Another User Signup, Login and Joining a Classroom.

```
Menu
1) Login
2) Signup
3) Exit
Select your Choice :2
Enter UserName :Priya
Enter Password :priya
Enter your role student or teacher :student
Enter Your Age :18
Enter your Location :Delhi
signing up.....
signup successful
Now Login With Your Credentials
*****
Menu
1) Login
2) Signup
3) Exit
Select your Choice :1
Enter UserName :Priya
Enter password :priya
Password Match
Login Success!!!
[{'_id': ObjectId('5ec7b709983fba0265a80008'), 'user_name': 'Priya', 'password': 'priya', 'age': 18, 'lhi'}]
*****
Menu
1) View Profile
2) Join a Class
3) View Joined Classes
4) Leave a Class
5) Logout
Select your Choice :2
Enter Code of the Classroom you want to join :dbms123
Classroom Found!!
Updated Class Database
Updated User Profile
```

24) Changes in users collection

```
> usersDB.find()
{ "_id" : ObjectId("5ec7b44a983fba0265a80005"), "user_name" : "Sujith", "password" : "sujith", "age" : 28, "role" : "teacher", "classes" : [ "dbms123" ], "location" : "AP" }
{ "_id" : ObjectId("5ec7b5b1983fba0265a80007"), "user_name" : "Rakesh", "password" : "rakesh", "age" : 18, "role" : "student", "classes" : [ "dbms123" ], "location" : "Delhi" }
{ "_id" : ObjectId("5ec7b709983fba0265a80008"), "user_name" : "Priya", "password" : "priya", "age" : 18, "role" : "student", "classes" : [ "dbms123" ], "location" : "Delhi" }
```

25) Changes in classes collection

```
> classesDB.find()
{ "_id" : ObjectId("5ec7b507983fba0265a80006"), "class_code" : "dbms123", "subject" : "Dbms", "teacherID" : ObjectId("5ec7b44a983fba0265a80005"), "studentsIDs" : [ ObjectId("5ec7b5b1983fba0265a80007"), ObjectId("5ec7b709983fba0265a80008") ] }
```

26)Teacher deleting a class. This operation will also deletes classroom code from respective students also

```
Menu
1) Login
2) Signup
3) Exit
Select your Choice :1
Enter UserName :Sujith
Enter password :sujith
Password Match
Login Success!!!
[{'_id': ObjectId('5ec7b44a983fba0265a80005'), 'user_name': 'Sujith', 'password': 'sujith', 'age': 28, 'role': 'teacher', 'classes': ['dbms123'], 'location': 'AP'}]
*****
Menu
1) View Profile
2) Create a Class
3) View Created Classes
4) Delete a Class
5) Logout
Select your Choice :4
Enter Subject Code of the Classroom which you want to delete :dbms123
You have permissions to Delete the classroom
Current Profile Updated
Your Profile
{'_id': ObjectId('5ec7b44a983fba0265a80005'), 'user_name': 'Sujith', 'password': 'sujith', 'age': 28, 'role': 'teacher', 'classes': [], 'location': 'AP'}
Updated for Student
Updated for Student
All Students Profile is Updated
*****
```

27)Changes in Student Profiles(deletion of classroom code)

```
Menu
1) Login
2) Signup
3) Exit
Select your Choice :1
Enter UserName :Priya
Enter password :priya
Password Match
Login Success!!!
[{'_id': ObjectId('5ec7b709983fba0265a80008'), 'user_name': 'Priya', 'password': 'priya', 'age': 18, 'role': 'student', 'classes': [], 'location': 'Delhi'}]
*****
Menu
1) View Profile
2) Join a Class
3) View Joined Classes
4) Leave a Class
5) Logout
Select your Choice :3
List of Classes Joined
*****
```

28) Logging Out and Exiting Application

[illegible]

Conclusion

All Security related cases are taken care like

- *Username already in use (During Signup).*
- *Joining a class which doesnot exists.*
- *Leaving a class which is not joined first.*
- *Trying to delete a class which is not created by that user.*
- *All other invalid Choices Selected.*

Different levels of Authorizations are provided like

- *DatabaseAdmin(run in mongo shell)*
- *Teachers (can create and delete classes)*
- *Students (can join and leave classes)*

None of their functionalities are overlapping.

*Application program is written in **python 3.8.2**.*

Application program link :

https://github.com/sujithsagar217/classroomPlus/blob/master/test_run.py

Application program is uploaded on Github and the system should have MongoDB downloaded inorder to run application program.

Download link :

<https://www.mongodb.com/download-center/community>

References

- <https://specify.io/how-tos/find-documents-in-mongodb-using-the-mongo-shell>
- <https://api.mongodb.com/python/current/tutorial.html>
- https://www.w3schools.com/python/python_mongodb_getstarted.asp