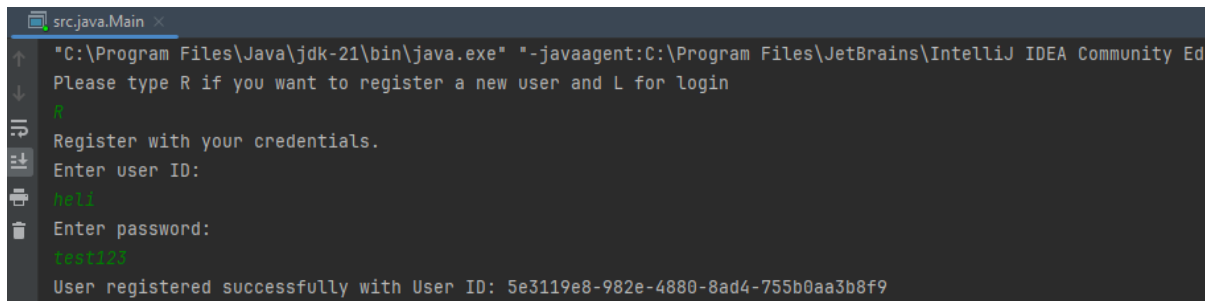


Light weight DBMS with Java

1. Module: User Authentication

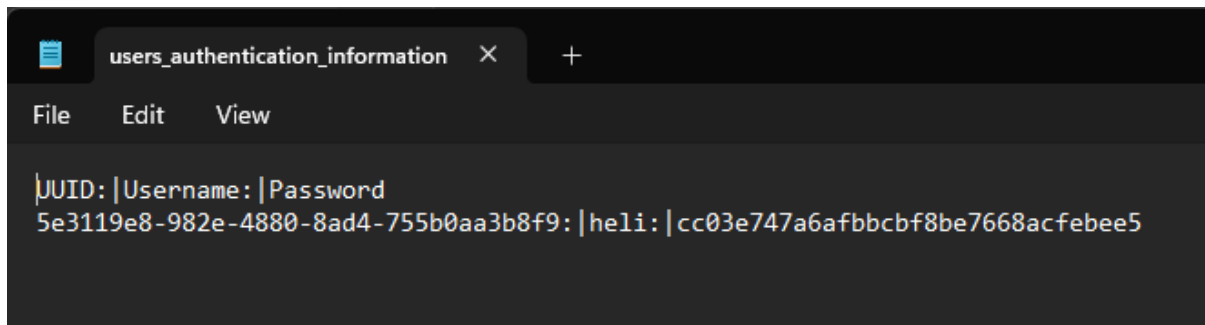
1. Scenario: User Registration Process

Objective: Verify the user registration functionality through the Console, which prompts for user ID and password inputs, generates a unique UUID for each user, and records the details in the users_authentication_information.txt file.



```
src.java.Main x
"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Ed
Please type R if you want to register a new user and L for login
R
Register with your credentials.
Enter user ID:
helli
Enter password:
test123
User registered successfully with User ID: 5e3119e8-982e-4880-8ad4-755b0aa3b8f9
```

Figure 1: new user registration successfully.



```
users_authentication x +
File Edit View
UUID: |Username: |Password
5e3119e8-982e-4880-8ad4-755b0aa3b8f9: |helli: |cc03e747a6afbbcbf8be7668acfebee5
```

Figure 2: data updated successfully in user_authentication_information.txt file.

2. Scenario: User Login process

Objective: verifies the user id password already exist and are correct, then prompt captcha when entered correctly, user login is successful

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA
Please type R if you want to register a new user and L for login
L
Login with your credentials.
Enter user ID:
heli
Enter password:
test123
Please Solve Captcha: Enter What is 1 + 4?
8
Login successful! :)
```

Figure 3: User login successful with captcha.

```
Please type R if you want to register a new user and L for login
L
Login with your credentials.
Enter user ID:
heli
Enter password:
desai
Invalid credentials!! :(
```

Figure 4: user login failed due to incorrect password.

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program F
Please type R if you want to register a new user and L for login
L
Login with your credentials.
Enter user ID:
heli
Enter password:
test123
Please Solve Captcha: Enter What is 8 + 1?
10
Captcha verification failed!! :(
```

Figure 5: user login failed due to incorrect captcha.

2. Module: Database Creation

1. Scenario: Database creation

Objective: verifies if database is created for user. Only one database can be created per user. If database already exists, user can delete and create another or continue with the existing database.

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.3.3\lib\idea_rt.jar=6025:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.3.3\bin" -jar C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.3.3\bin\idea.exe
Please type R if you want to register a new user and L for login
L
Login with your credentials.
Enter user ID:
heli
Enter password:
test123
Please Solve Captcha: Enter What is 1 + 4?
5
Login successful! :)
Please enter the new database name:
testdb1
Database "testdb1" created successfully for user ID: heli
Database path: D:\Dal\CSCI-5408\csci5408_w24_b00963832_heli_desai\Assignments\Assignment1\users_databases\heli\testdb1
```

Figure 6: Database creation successful.

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.3.3\lib\idea_rt.jar=6025:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.3.3\bin" -jar C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.3.3\bin\idea.exe
Please type R if you want to register a new user and L for login
L
Login with your credentials.
Enter user ID:
heli
Enter password:
test123
Please Solve Captcha: Enter What is 0 + 1?
1
Login successful! :)
A database already exists for user ID: heli with name "testdb1".
Do you want to still want to DELETE it and create a new one? (Y/N)
Y
Existing database deleted successfully.
Please enter the new database name:
testdb2
Database "testdb2" created successfully for user ID: heli
Database path: D:\Dal\CSCI-5408\csci5408_w24_b00963832_heli_desai\Assignments\Assignment1\users_databases\heli\testdb2
```

Figure 7: Deletion of old and Creation of new database if already exists.

3. Module: Query execution

1. Scenario: CREATE table query

Objective: verify if table creation query works with create table command. If successful, in the database directory of the user 2 files are created, 1 – the table file which will have values stored and the metadata file which will have the metadata about the table columns.

```

"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.3.3\
Please type R if you want to register a new user and L for login
L
Login with your credentials.
Enter user ID:
heli
Enter password:
test123
Please Solve Captcha: Enter What is 0 + 1?
3
Login successful! :)
A database already exists for user ID: heli with name "testdb1".
Do you want to still want to DELETE it and create a new one? (Y/N)
Y
Existing database deleted successfully.
Please enter the new database name:
testdb2
Database "testdb2" created successfully for user ID: heli
Database path: D:\Dal\CSCI-5408\csci5408_w24_b00963832_heli_desai\Assignments\Assignment1\users_databases\heli\testdb2
Please enter the query you want to execute or type X to exit:
create table students (id int, name varchar(100), marks int);
Table and metadata for students created successfully.

```

Figure 8: Table and metadata creation with CREATE TABLE query.

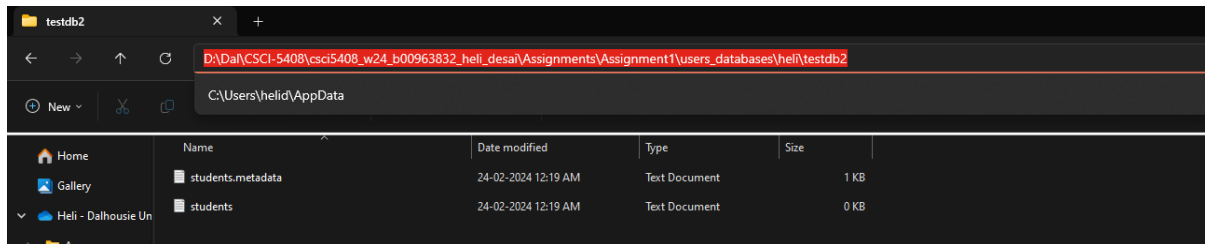


Figure 9: successful creation of metadata and table file in database folder.

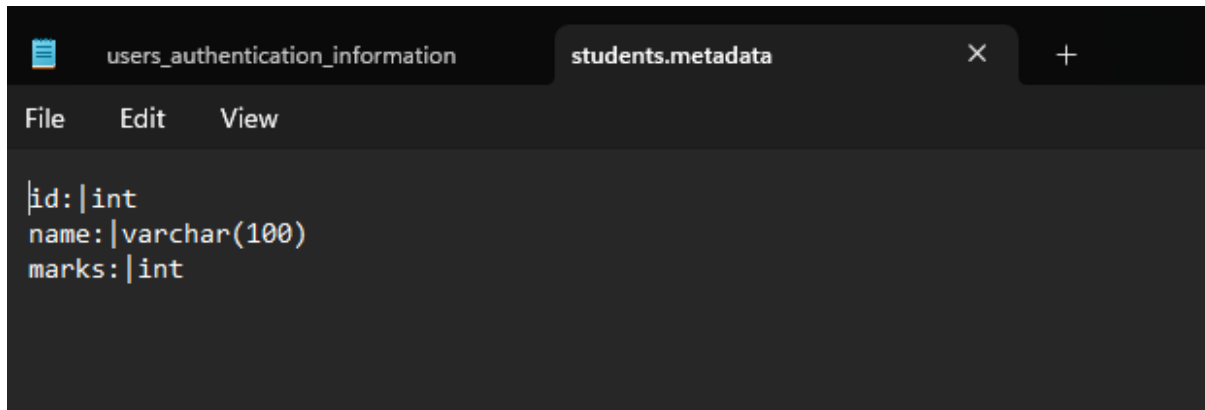


Figure 10: snippet of metadata file after create table query.

Scenario: INSERT query

Objective: verify if values are correctly added to the table while using the insert query.

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program Files\JetE
Please type R if you want to register a new user and L for login
L
Login with your credentials.
Enter user ID:
heli
Enter password:
test123
Please Solve Captcha: Enter What is 8 + 0?
8
Login successful! :)
A database already exists for user ID: heli with name "testdb2".
Do you want to still want to DELETE it and create a new one? (Y/N)
N
Continuing with the existing database "testdb2".
Database path: users_databases\heli\testdb2
Please enter the query you want to execute or type X to exit:
insert into students value (1, heli, 30);
Data inserted into table students.
```

Figure 11: successful data insertion in console.

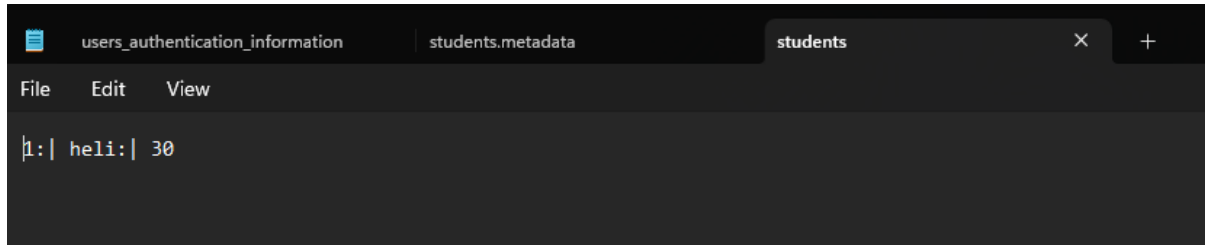


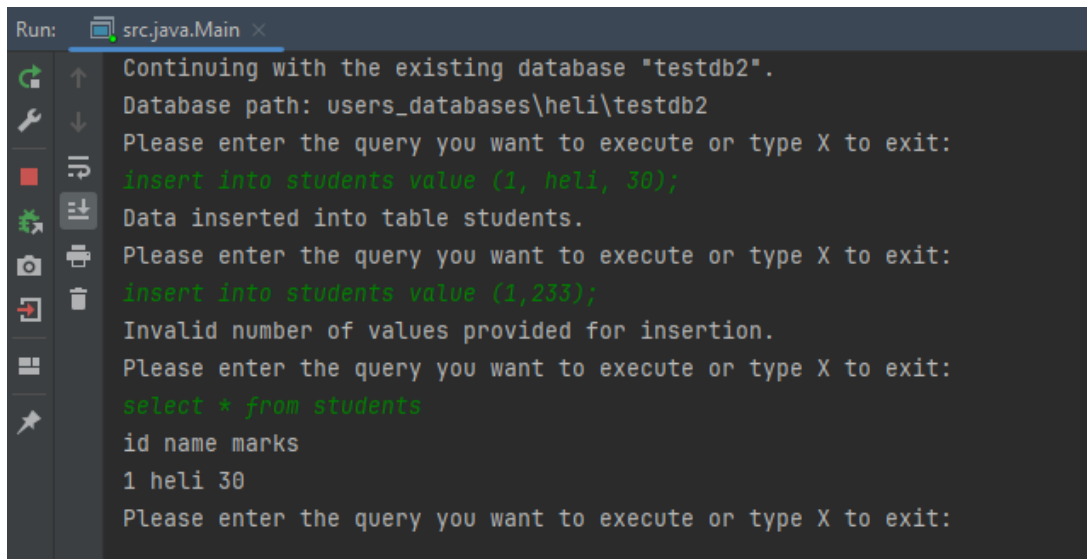
Figure 12: successful values added in the table file.

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program Files\Jet
Please type R if you want to register a new user and L for login
L
Login with your credentials.
Enter user ID:
heli
Enter password:
test123
Please Solve Captcha: Enter What is 8 + 0?
8
Login successful! :)
A database already exists for user ID: heli with name "testdb2".
Do you want to still want to DELETE it and create a new one? (Y/N)
N
Continuing with the existing database "testdb2".
Database path: users_databases\heli\testdb2
Please enter the query you want to execute or type X to exit:
insert into students value (1, heli, 30);
Data inserted into table students.
Please enter the query you want to execute or type X to exit:
insert into students value (1,233);
Invalid number of values provided for insertion.
Please enter the query you want to execute or type X to exit:
```

Figure 13: failure scenario where values are not correctly added in the query.

2. Scenario: SELECT query

Objective: verify if select query reflect correct value from the database stored.



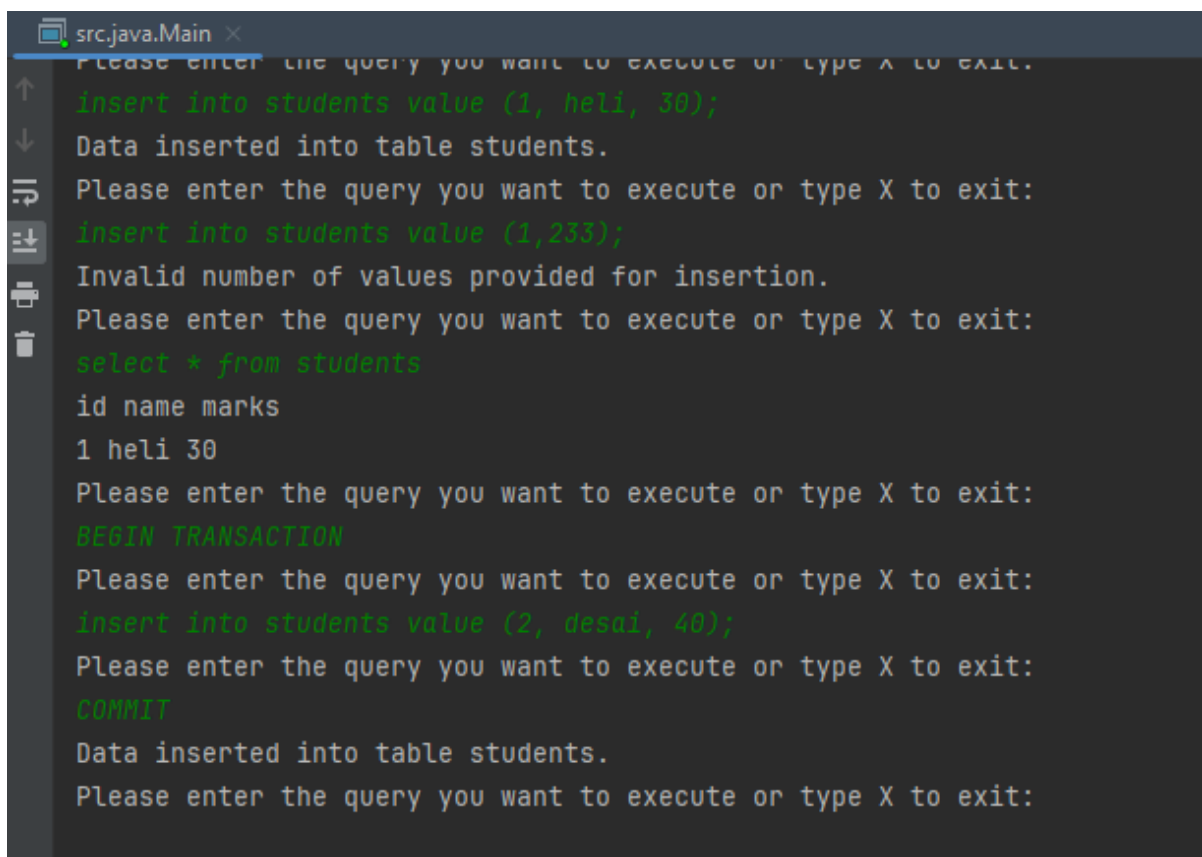
The screenshot shows a Java application window titled 'src.java.Main'. The console output is as follows:

```
Run: src.java.Main x
Continuing with the existing database "testdb2".
Database path: users_databases\heli\testdb2
Please enter the query you want to execute or type X to exit:
insert into students value (1, heli, 30);
Data inserted into table students.
Please enter the query you want to execute or type X to exit:
insert into students value (1,233);
Invalid number of values provided for insertion.
Please enter the query you want to execute or type X to exit:
select * from students
id name marks
1 heli 30
Please enter the query you want to execute or type X to exit:
```

Figure 14: successful display for select query.

1. Scenario: Transaction control

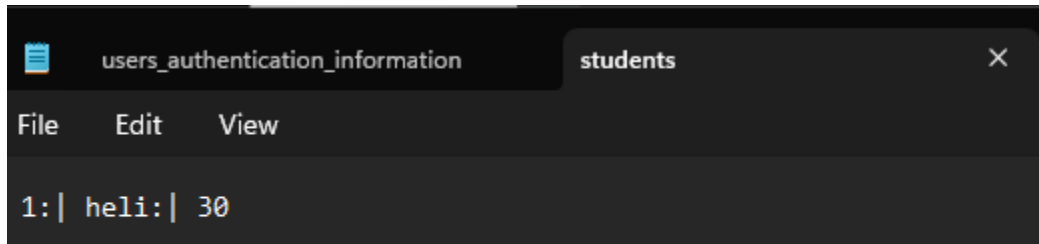
Objective: verify if correct implementation for transaction is reflected. Check the output is reflected only after committed.



The screenshot shows the same Java application window with the following console output:

```
src.java.Main x
Please enter the query you want to execute or type X to exit:
insert into students value (1, heli, 30);
Data inserted into table students.
Please enter the query you want to execute or type X to exit:
insert into students value (1,233);
Invalid number of values provided for insertion.
Please enter the query you want to execute or type X to exit:
select * from students
id name marks
1 heli 30
Please enter the query you want to execute or type X to exit:
BEGIN TRANSACTION
Please enter the query you want to execute or type X to exit:
insert into students value (2, desai, 40);
Please enter the query you want to execute or type X to exit:
COMMIT
Data inserted into table students.
Please enter the query you want to execute or type X to exit:
```

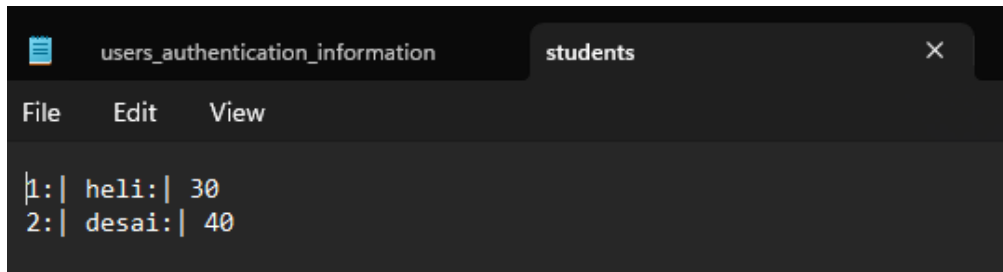
Figure 15: transaction with query in console.



The screenshot shows a database editor window with two tabs: 'users_authentication_information' and 'students'. The 'students' tab is active. Below the menu bar (File, Edit, View), the table content is displayed as a single row: 1: | heli: | 30.

1:	heli:	30
----	-------	----

Figure 16: student table before commit.



The screenshot shows the same database editor window. The 'students' tab is active. The table content is now displayed as two rows: 1: | heli: | 30 and 2: | desai: | 40.

1:	heli:	30
2:	desai:	40

Figure 17: student table after commit.