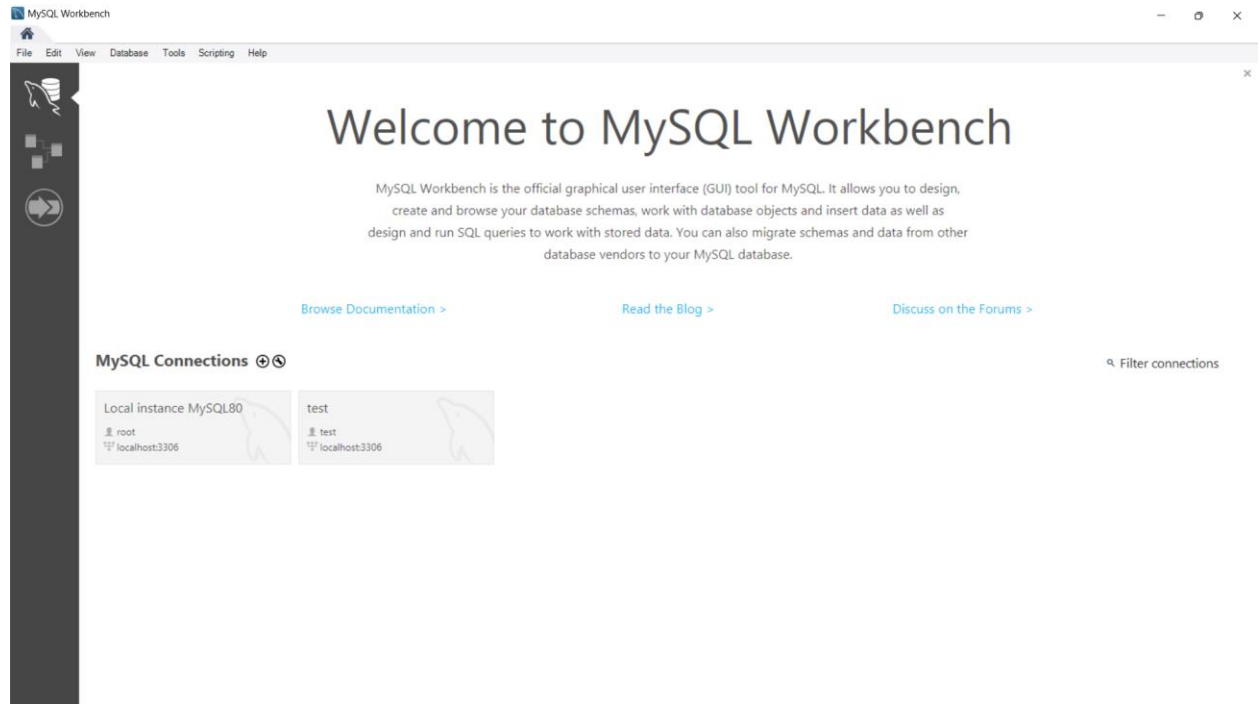


Assignment 2 FDB:

1) Step 1:

First open the vs code terminal which is the most interactive working environment for developers

2) Step 2: open work bench if the server is running or not.

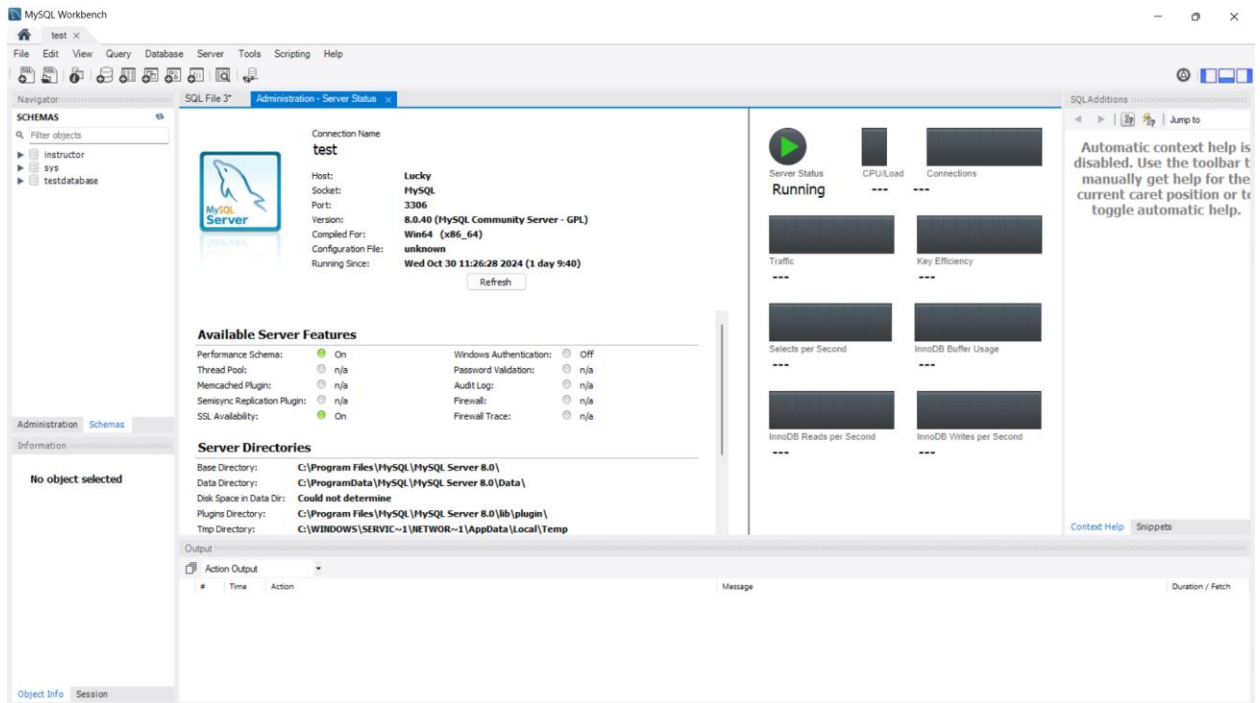


You can see I made 2 connections already one is test connection where we are going to connect our application to this connection name “test”. Open this connection and enter the password and check the server status and it should show running.

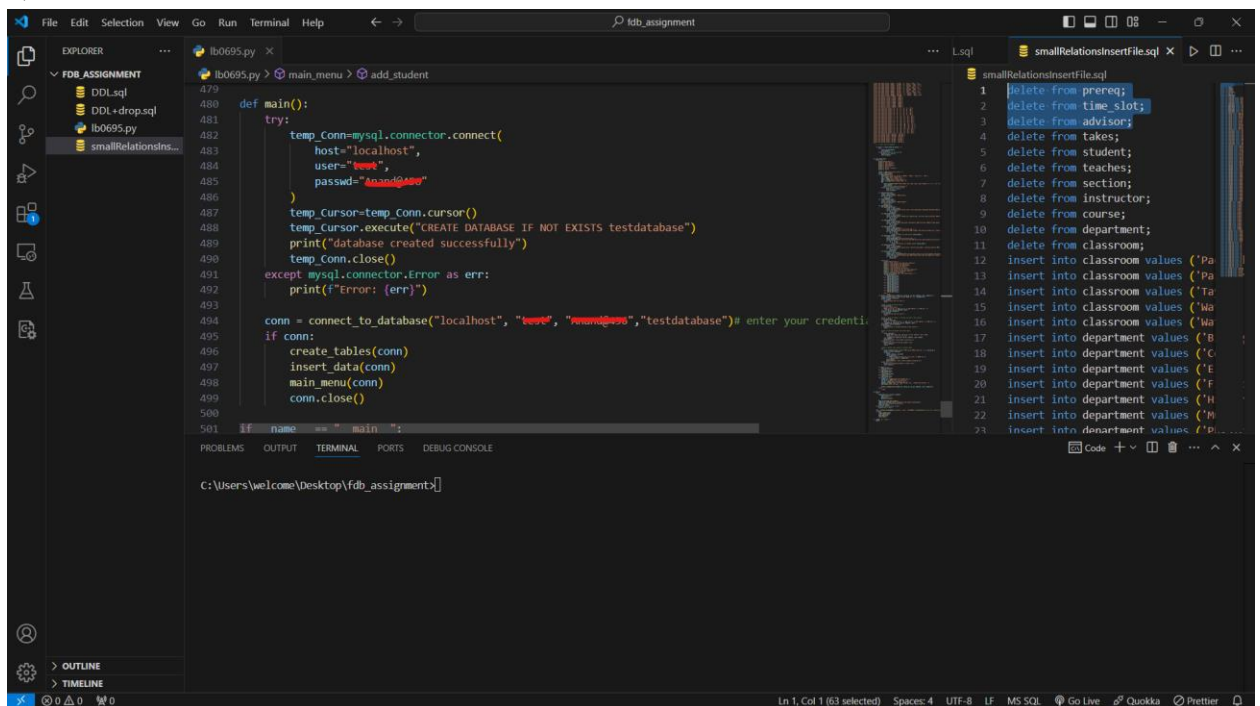
3) Return back to the VScode environment and create the python file.

4) Next step 3:open the terminal to install the packages like mysql-connector-python and make sure the python is installed and vscode able to run with the interpreter.

5) Next import the packages and look for the main function.



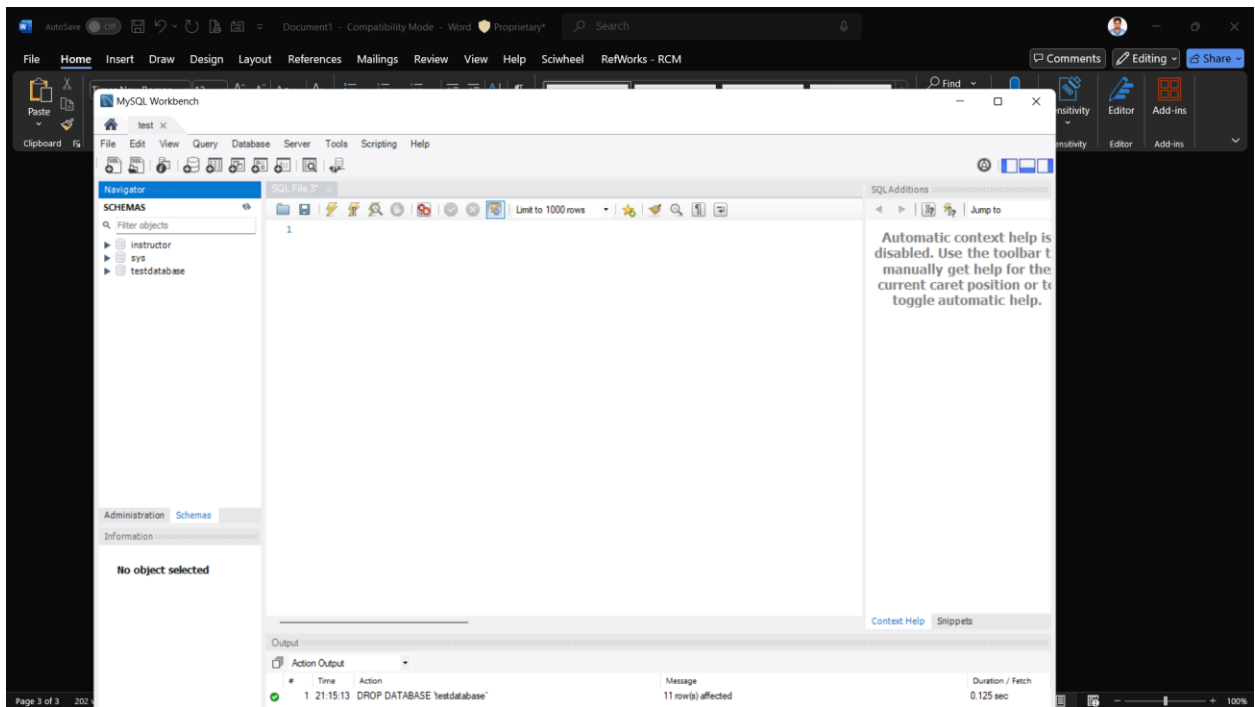
6)



Where I striked with the red marker enter your details in the ipynb file. If your running my file for the first time.

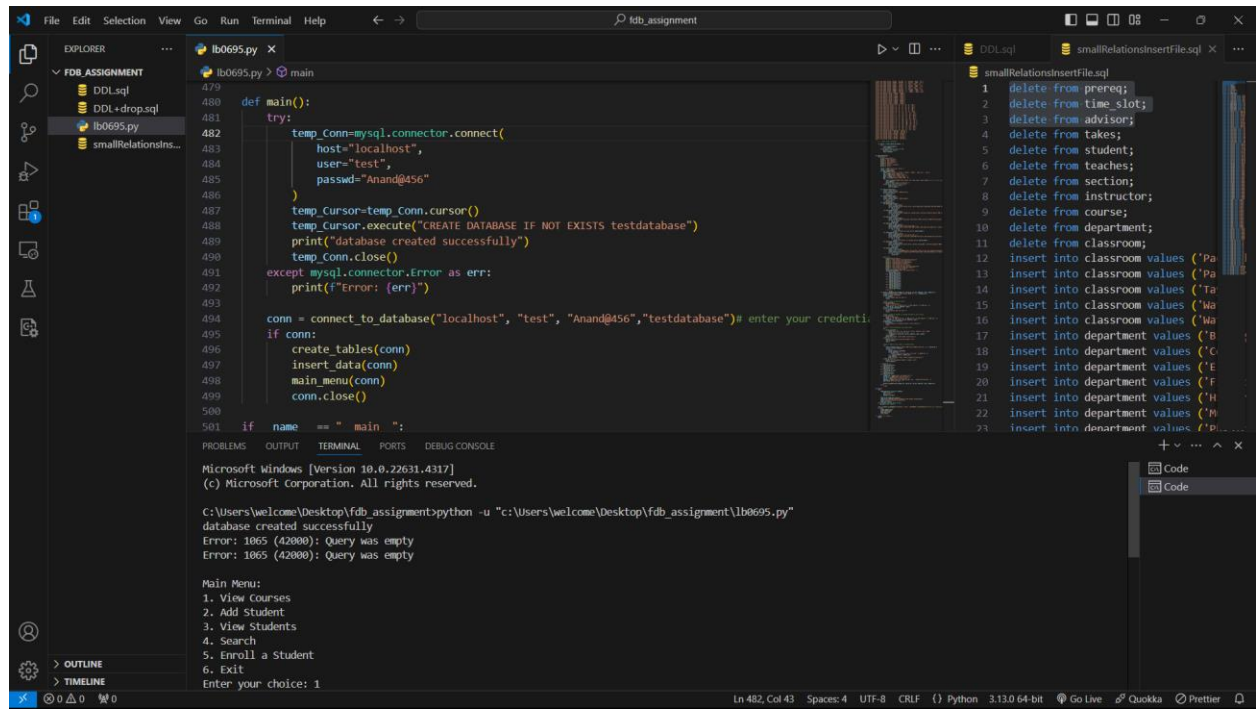
7). Step 4: just run the python file

9)



We can see the database created successfully using the migration.

10) Let's perform the each task



The screenshot shows a VS Code editor with a file explorer on the left containing 'DDL.sql', 'DDL+drop.sql', 'lib0695.py', and 'smallRelationsIns...'. The main editor displays 'lib0695.py' with the following code:

```
479
480 def main():
481     try:
482         temp_conn=mysql.connector.connect(
483             host="localhost",
484             user="test",
485             passwd="Anand@456"
486         )
487         temp_cursor=temp_conn.cursor()
488         temp_cursor.execute("CREATE DATABASE IF NOT EXISTS testdatabase")
489         print("database created successfully")
490         temp_conn.close()
491     except mysql.connector.Error as err:
492         print(f"Error: {err}")
493
494     conn = connect_to_database("localhost", "test", "Anand@456","testdatabase")# enter your credenti.
495     if conn:
496         create_tables(conn)
497         insert_data(conn)
498         main_menu(conn)
499         conn.close()
500
501 if __name__ == "__main__":
```

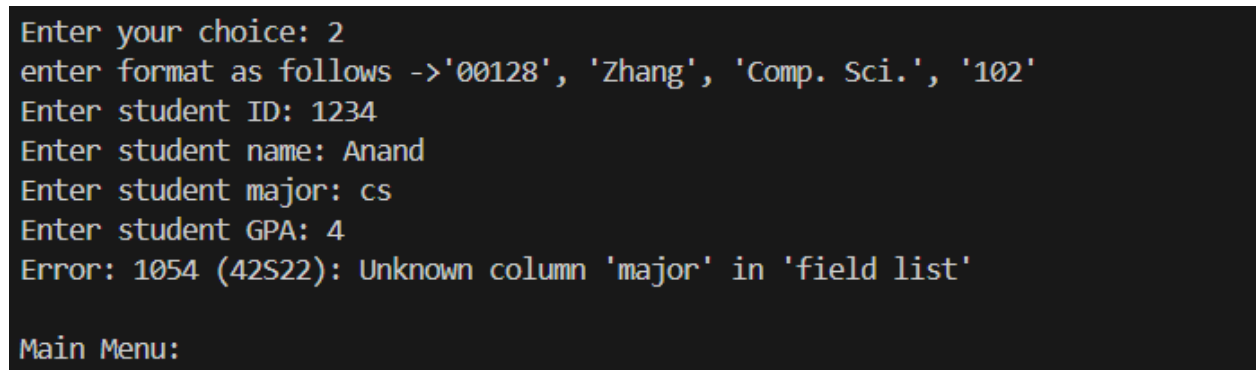
The terminal window at the bottom shows the output of running the script:

```
Microsoft Windows [Version 10.0.22631.4317]
(c) Microsoft Corporation. All rights reserved.

C:\Users\welcome\Desktop\fdb_assignment>python -u "c:\Users\welcome\Desktop\fdb_assignment\lib0695.py"
database created successfully
Error: 1065 (42000): Query was empty
Error: 1065 (42000): Query was empty

Main Menu:
1. View Courses
2. Add Student
3. View Students
4. Search
5. Enroll a Student
6. Exit
Enter your choice: 1
```

Error triggers:



The terminal window shows the following sequence of inputs and the resulting error:

```
Enter your choice: 2
enter format as follows ->'00128', 'Zhang', 'Comp. Sci.', '102'
Enter student ID: 1234
Enter student name: Anand
Enter student major: cs
Enter student GPA: 4
Error: 1054 (42S22): Unknown column 'major' in 'field list'

Main Menu:
```

after handling:

```
File Edit Selection View Go Run Terminal Help
kdb_assignment

EXPLORER
FDB_ASSIGNMENT
DDL.sql
DDL+drop.sql
lib0695.py
smallRelationsins...

lib0695.py
def main_menu(conn):
    181
    def main_menu(conn):
        PROBLEMS OUTPUT TERMINAL PORTS DEBUG CONSOLE

        6. Exit
        Enter your choice: 1
        ('BIO-181', 'Intro. to Biology', 'Biology', Decimal('4'))
        ('BIO-381', 'Genetics', 'Biology', Decimal('4'))
        ('BIO-399', 'Computational Biology', 'Biology', Decimal('3'))
        ('CS-101', 'Intro. to Computer Science', 'Comp. Sci.', Decimal('4'))
        ('CS-198', 'Game Design', 'Comp. Sci.', Decimal('4'))
        ('CS-315', 'Robotics', 'Comp. Sci.', Decimal('3'))
        ('CS-319', 'Image Processing', 'Comp. Sci.', Decimal('3'))
        ('CS-347', 'Database System Concepts', 'Comp. Sci.', Decimal('3'))
        ('EE-181', 'Intro. to Digital Systems', 'Elec. Eng.', Decimal('3'))
        ('FIN-201', 'Investment Banking', 'Finance', Decimal('3'))
        ('HIS-351', 'World History', 'History', Decimal('3'))
        ('MU-199', 'Music Video Production', 'Music', Decimal('3'))
        ('PHY-181', 'Physical Principles', 'Physics', Decimal('4'))

        Main Menu:
        1. View Courses
        2. Add Student
        3. View Students
        4. Search
        5. Enroll a Student
        6. Exit
        Enter your choice: 2
        enter format as follows ->'00128', 'Zhang', 'Comp. Sci.', '182'
        Enter student ID: 1234
        Enter student name: anand
        Enter student dept_name: Comp. Sci.
        Enter student tot_cred: 3
        Student added successfully.

        Main Menu:
        1. View Courses
        2. Add Student
        3. View Students
        4. Search
        5. Enroll a Student
        6. Exit
        Enter your choice:

Ln 317, Col 51 Spaces: 4 UTF-8 CRLF Python 3.13.0 64-bit Go Live Quokka Prettier
```

View students option:

```
File Edit Selection View Go Run Terminal Help
kdb_assignment

EXPLORER
FDB_ASSIGNMENT
DDL.sql
DDL+drop.sql
lib0695.py
smallRelationsins...

lib0695.py
def main_menu(conn):
    181
    def main_menu(conn):
        PROBLEMS OUTPUT TERMINAL PORTS DEBUG CONSOLE

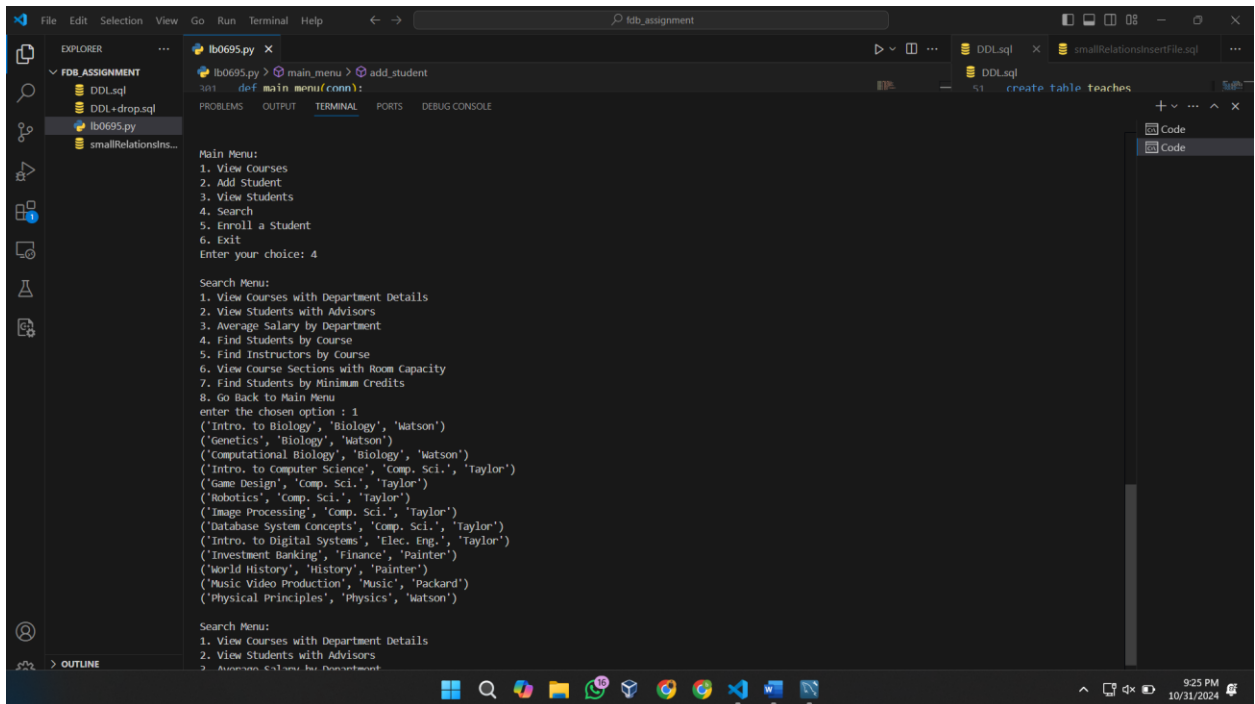
        Enter your choice: 2
        enter format as follows ->'00128', 'Zhang', 'Comp. Sci.', '182'
        Enter student ID: 1234
        Enter student name: anand
        Enter student dept_name: Comp. Sci.
        Enter student tot_cred: 3
        Student added successfully.

        Main Menu:
        1. View Courses
        2. Add Student
        3. View Students
        4. Search
        5. Enroll a Student
        6. Exit
        Enter your choice: 3
        ('00128', 'Zhang', 'Comp. Sci.', Decimal('182'))
        ('1234', 'anand', 'Comp. Sci.', Decimal('3'))
        ('12345', 'Shankar', 'Comp. Sci.', Decimal('32'))
        ('19991', 'Brandt', 'History', Decimal('80'))
        ('23121', 'Chavez', 'Finance', Decimal('110'))
        ('44553', 'Peltier', 'Physics', Decimal('56'))
        ('45678', 'Levy', 'Physics', Decimal('46'))
        ('54321', 'Williams', 'Comp. Sci.', Decimal('54'))
        ('55739', 'Sanchez', 'Music', Decimal('38'))
        ('70557', 'Snow', 'Physics', Decimal('0'))
        ('76543', 'Brown', 'Comp. Sci.', Decimal('58'))
        ('76653', 'Aoi', 'Elec. Eng.', Decimal('60'))
        ('88765', 'Bourikas', 'Elec. Eng.', Decimal('98'))
        ('98988', 'Tanaka', 'Biology', Decimal('120'))

        Main Menu:
        1. View Courses
        2. Add Student
        3. View Students
        4. Search
        5. Enroll a Student
        6. Exit
        Enter your choice:

Ln 317, Col 51 Spaces: 4 UTF-8 CRLF Python 3.13.0 64-bit Go Live Quokka Prettier
```

Search option:



```
File Edit Selection View Go Run Terminal Help kdb_assignment
EXPLORER
  FDB_ASSIGNMENT
    DDL.sql
    DDL+drop.sql
    lb0695.py
    smallRelationsins...
  OUTLINE
  SEARCH
  SOURCE CONTROL
  TEST RUNNER
  DEBUG CONSOLE
  PROBLEMS
  OUTPUT
  TERMINAL
  PORTS
  DEBUG CONSOLE
  lb0695.py
  main_menu > add_student
  def main_menu(conn):
  Main Menu:
  1. View Courses with Department Details
  2. View Students with Advisors
  3. View Students
  4. Search
  5. Enroll a Student
  6. Exit
  Enter your choice: 4
  Search Menu:
  1. View Courses with Department Details
  2. View Students with Advisors
  3. Average Salary by Department
  4. Find Students by Course
  5. Find Instructors by Course
  6. View Course Sections with Room Capacity
  7. Find Students by Minimum Credits
  8. Go Back to Main Menu
  enter the chosen option : 1
  ('Intro. to Biology', 'Biology', 'Watson')
  ('Genetics', 'Biology', 'Watson')
  ('Computational Biology', 'Biology', 'Watson')
  ('Intro. to Computer Science', 'Comp. Sci.', 'Taylor')
  ('Game Design', 'Comp. Sci.', 'Taylor')
  ('Robotics', 'Comp. Sci.', 'Taylor')
  ('Image Processing', 'Comp. Sci.', 'Taylor')
  ('Database System Concepts', 'Comp. Sci.', 'Taylor')
  ('Intro. to Digital Systems', 'Elec. Eng.', 'Taylor')
  ('Investment Banking', 'Finance', 'Painter')
  ('World History', 'History', 'Painter')
  ('Music Video Production', 'Music', 'Packard')
  ('Physical Principles', 'Physics', 'Watson')
  Search Menu:
  1. View Courses with Department Details
  2. View Students with Advisors
  3. Average Salary by Department
  4. Find Students by Course
  5. Find Instructors by Course
  6. View Course Sections with Room Capacity
  7. Find Students by Minimum Credits
  8. Go Back to Main Menu
  enter the chosen option : 1
  ('Intro. to Biology', 'Biology', 'Watson')
  ('Genetics', 'Biology', 'Watson')
  ('Computational Biology', 'Biology', 'Watson')
  ('Intro. to Computer Science', 'Comp. Sci.', 'Taylor')
  ('Game Design', 'Comp. Sci.', 'Taylor')
  ('Robotics', 'Comp. Sci.', 'Taylor')
  ('Image Processing', 'Comp. Sci.', 'Taylor')
  ('Database System Concepts', 'Comp. Sci.', 'Taylor')
  ('Intro. to Digital Systems', 'Elec. Eng.', 'Taylor')
  ('Investment Banking', 'Finance', 'Painter')
  ('World History', 'History', 'Painter')
  ('Music Video Production', 'Music', 'Packard')
  ('Physical Principles', 'Physics', 'Watson')
  Search Menu:
  1. View Courses with Department Details
  2. View Students with Advisors
  3. Average Salary by Department
  4. Find Students by Course
  5. Find Instructors by Course
  6. View Course Sections with Room Capacity
  7. Find Students by Minimum Credits
  8. Go Back to Main Menu
  enter the chosen option : 5
  enter the course name : Intro. to Computer Science
  Instructor Scinivasan teaches course Intro. to Computer Science
  Instructor Katz teaches course Intro. to Computer Science
  Search Menu:
  1. View Courses with Department Details
  2. View Students with Advisors
  3. Average Salary by Department
  4. Find Students by Course
  5. Find Instructors by Course
  6. View Course Sections with Room Capacity
  7. Find Students by Minimum Credits
  8. Go Back to Main Menu
  enter the chosen option : 1
```

View course sections and students with advisors below.

```
File Edit Selection View Go Run Terminal Help
kdb_assignment

EXPLORER
FDB_ASSIGNMENT
DDL.sql
DDL+drop.sql
lb0695.py
smallRelationsins...

lb0695.py
def main_menu(conn):
    Search Menu:
    1. View Courses with Department Details
    2. View Students with Advisors
    3. Average Salary by Department
    4. Find Students by Course
    5. Find Instructors by Course
    6. View Course Sections with Room Capacity
    7. Find Students by Minimum Credits
    8. Go Back to Main Menu
    enter the chosen option : 2
    ('76543', 'Brown', 'Singh')

    Search Menu:
    1. View Courses with Department Details
    2. View Students with Advisors
    3. Average Salary by Department
    4. Find Students by Course
    5. Find Instructors by Course
    6. View Course Sections with Room Capacity
    7. Find Students by Minimum Credits
    8. Go Back to Main Menu
    enter the chosen option : 3
    ('Biology', Decimal('72000.000000'))
    ('Comp. Sci.', Decimal('77333.333333'))
    ('Elec. Eng.', Decimal('80000.000000'))
    ('Finance', Decimal('85000.000000'))
    ('History', Decimal('61000.000000'))
    ('Music', Decimal('40000.000000'))
    ('Physics', Decimal('91000.000000'))

    Search Menu:
    1. View Courses with Department Details
    2. View Students with Advisors
    3. Average Salary by Department
    4. Find Students by Course
    5. Find Instructors by Course
    6. View Course Sections with Room Capacity
    7. Find Students by Minimum Credits
    8. Go Back to Main Menu
    enter the chosen option : 7
    Find Students by Minimum Credits
```

```
File Edit Selection View Go Run Terminal Help
kdb_assignment

EXPLORER
FDB_ASSIGNMENT
DDL.sql
DDL+drop.sql
lb0695.py
smallRelationsins...

lb0695.py
def main_menu(conn):
    ('History', Decimal('61000.000000'))
    ('Music', Decimal('40000.000000'))
    ('Physics', Decimal('91000.000000'))

    Search Menu:
    1. View Courses with Department Details
    2. View Students with Advisors
    3. Average Salary by Department
    4. Find Students by Course
    5. Find Instructors by Course
    6. View Course Sections with Room Capacity
    7. Find Students by Minimum Credits
    8. Go Back to Main Menu
    enter the chosen option : 4
    enter the course name : Elec. Eng.

    Search Menu:
    1. View Courses with Department Details
    2. View Students with Advisors
    3. Average Salary by Department
    4. Find Students by Course
    5. Find Instructors by Course
    6. View Course Sections with Room Capacity
    7. Find Students by Minimum Credits
    8. Go Back to Main Menu
    enter the chosen option : 4
    enter the course name : Intro. to Biology
    student Tanaka took course Intro. to Biology

    Search Menu:
    1. View Courses with Department Details
    2. View Students with Advisors
    3. Average Salary by Department
    4. Find Students by Course
    5. Find Instructors by Course
    6. View Course Sections with Room Capacity
    7. Find Students by Minimum Credits
    8. Go Back to Main Menu
    enter the chosen option : 
```



```
File Edit Selection View Go Run Terminal Help
kdb_assignment

EXPLORER
FDB_ASSIGNMENT
DDL.sql
DDL+drop.sql
lib0695.py
smallRelationsins...

lib0695.py
main_menu > add_student
def main_menu(conn):
    enter the course name : Intro. to Biology
    student Tanaka took course Intro. to Biology

Search Menu:
1. View Courses with Department Details
2. View Students with Advisors
3. Average Salary by Department
4. Find Students by course
5. Find Instructors by Course
6. View Course Sections with Room Capacity
7. Find Students by Minimum Credits
8. Go Back to Main Menu
enter the chosen option : 6
('Intro. to Computer Science', '101', Decimal('500'))
('Intro. to Computer Science', '101', Decimal('500'))
('Investment Banking', '101', Decimal('500'))
('Music Video Production', '101', Decimal('500'))
('Intro. to Biology', '514', Decimal('10'))
('Genetics', '514', Decimal('10'))
('World History', '514', Decimal('10'))
('Game Design', '3128', Decimal('70'))
('Game Design', '3128', Decimal('70'))
('Image Processing', '3128', Decimal('70'))
('Database System Concepts', '3128', Decimal('70'))
('Intro. to Digital Systems', '3128', Decimal('70'))
('Image Processing', '100', Decimal('30'))
('Physical Principles', '100', Decimal('30'))
('Robotics', '120', Decimal('50'))

Search Menu:
1. View Courses with Department Details
2. View Students with Advisors
3. Average Salary by Department
4. Find Students by course
5. Find Instructors by Course
6. View Course Sections with Room Capacity
7. Find Students by Minimum Credits
8. Go Back to Main Menu
enter the chosen option :
```

Showing the search min credits option

```
File Edit Selection View Go Run Terminal Help
kdb_assignment

EXPLORER
FDB_ASSIGNMENT
DDL.sql
DDL+drop.sql
lib0695.py
smallRelationsins...

lib0695.py
main_menu > add_student
def main_menu(conn):
    5. Find Instructors by Course
    6. View Course Sections with Room Capacity
    7. Find Students by Minimum Credits
    8. Go Back to Main Menu
    enter the chosen option : 7
    Enter the minimum credits to see the students applicable : 3
    ('Tanaka',)
    ('Zhang',)
    ('Shankar',)
    ('Levy',)
    ('Williams',)
    ('Brown',)
    ('Bourikas',)
    ('Aoi',)
    ('Chavez',)
    ('Brandt',)
    ('Sanchez',)
    ('Peltier',)

Search Menu:
1. View Courses with Department Details
2. View Students with Advisors
3. Average Salary by Department
4. Find Students by course
5. Find Instructors by course
6. View course Sections with Room Capacity
7. Find Students by Minimum Credits
8. Go Back to Main Menu
enter the chosen option : 7
Enter the minimum credits to see the students applicable : 2
('Tanaka',)
('Zhang',)
('Shankar',)
('Levy',)
('Williams',)
('Brown',)
('Bourikas',)
('Aoi',)
('Chavez',)
```

Give the input 8 to get back to main menu


```
File Edit Selection View Go Run Terminal Help
ldb_assignment

EXPLORER
FDB_ASSIGNMENT
DDL.sql
DDL+drop.sql
ldb0695.py
smallRelationsIns...

ldb0695.py
main_menu > add_student
def main_menu(conn):
    4. Find Students by Course
    5. Find Instructors by Course
    6. View Course Sections with Room Capacity
    7. Find Students by Minimum Credits
    8. Go Back to Main Menu
    enter the chosen option : 7
    Enter the minimum credits to see the students applicable : 2
    ('Tanaka',)
    ('Zhang',)
    ('Shankar',)
    ('Levy',)
    ('Williams',)
    ('Brown',)
    ('Bourikas',)
    ('Aoi',)
    ('Chavez',)
    ('Brandt',)
    ('Sanchez',)
    ('Peltier',)

    Search Menu:
    1. View Courses with Department Details
    2. View Students with Advisors
    3. Average Salary by Department
    4. Find Students by Course
    5. Find Instructors by Course
    6. View Course Sections with Room Capacity
    7. Find Students by Minimum Credits
    8. Go Back to Main Menu
    enter the chosen option : 8

    Main Menu:
    1. View Courses
    2. Add Student
    3. View Students
    4. Search
    5. Enroll a Student
    6. Exit
    Enter your choice: 
```

Last one enroll the student:

Steps: first checks the student exists, section exists, course check if any prerequisites needs to be met and then the student gets enrolled. Otherwise student couldn't enroll.

```
File Edit Selection View Go Run Terminal Help
ldb_assignment

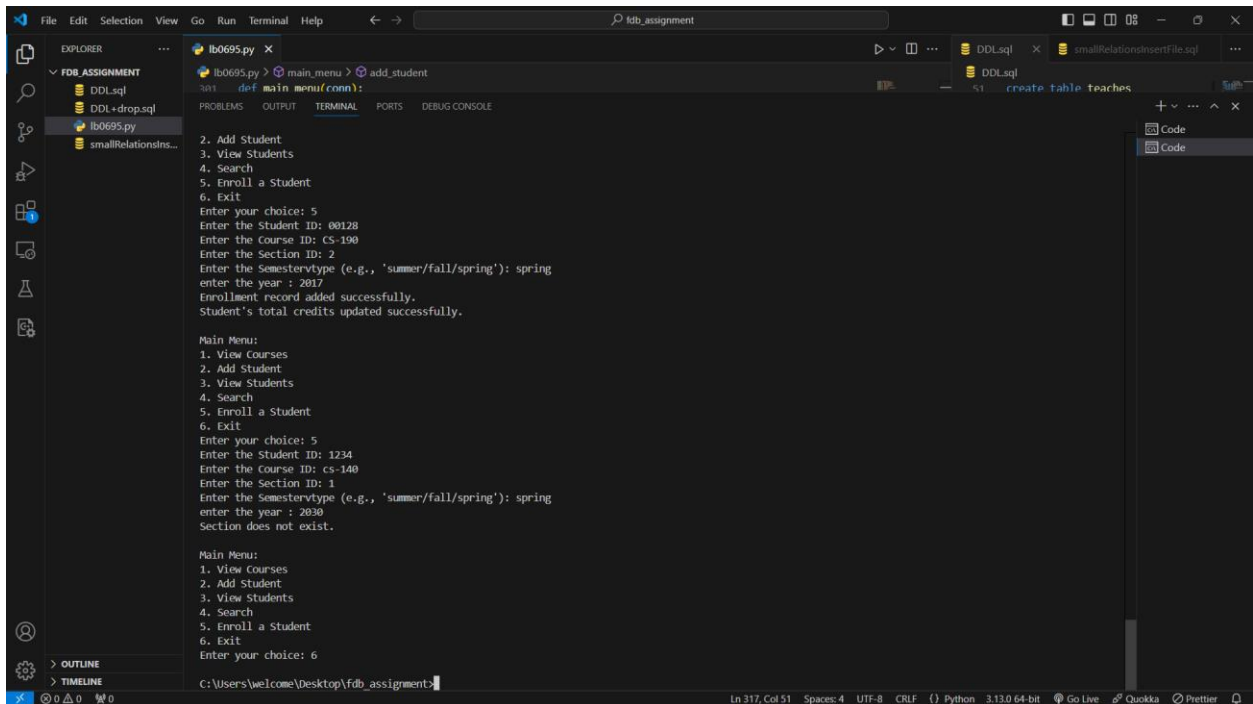
EXPLORER
FDB_ASSIGNMENT
DDL.sql
DDL+drop.sql
ldb0695.py
smallRelationsIns...

ldb0695.py
main_menu > add_student
def main_menu(conn):
    Main Menu:
    1. View Courses
    2. Add Student
    3. View Students
    4. Search
    5. Enroll a Student
    6. Exit
    Enter your choice: 5
    Enter the Student ID: 00128
    Enter the Course ID: CS-190
    Enter the Section ID: 2
    Enter the Semestertype (e.g., 'summer/fall/spring'): spring
    enter the year : 2017
    Enrollment record added successfully.
    Student's total credits updated successfully.

    Main Menu:
    1. View Courses
    2. Add Student
    3. View Students
    4. Search
    5. Enroll a Student
    6. Exit
    Enter your choice: 5
    Enter the Student ID: 1234
    Enter the Course ID: cs-140
    Enter the Section ID: 1
    Enter the Semestertype (e.g., 'summer/fall/spring'): spring
    enter the year : 2030
    Section does not exist.

    Main Menu:
    1. View Courses
    2. Add Student
    3. View Students
    4. Search
    5. Enroll a Student
    6. Exit
    Enter your choice: 
```

Connection on choosing option 6:



```
def main_menu(conn):
    2. Add Student
    3. View Students
    4. Search
    5. Enroll a Student
    6. Exit
    Enter your choice: 5
    Enter the Student ID: 00128
    Enter the Course ID: CS-190
    Enter the Section ID: 2
    Enter the Semestervtype (e.g., 'summer/fall/spring'): spring
    enter the year : 2017
    Enrollment record added successfully.
    Student's total credits updated successfully.

Main Menu:
1. View Courses
2. Add Student
3. View Students
4. Search
5. Enroll a Student
6. Exit
Enter your choice: 5
Enter the Student ID: 1234
Enter the Course ID: cs-140
Enter the Section ID: 1
Enter the Semestervtype (e.g., 'summer/fall/spring'): spring
enter the year : 2030
Section does not exist.

Main Menu:
1. View Courses
2. Add Student
3. View Students
4. Search
5. Enroll a Student
6. Exit
Enter your choice: 6
```

Overview:

This application:

Creates database on it's own

Handles errors, reliable

Transaction management

Can able to handle duplicate entries

If user gives another datatype like instead of string given a number asks the user to enter the input again.

Migration of tables and data is included.

Multiple times the script can be runnable.

Secure in the sense of All the connections are established and closed on exit.

