IMPROVING STUDENT WELLBEING TOGETHER

STUDENT MENTAL HEALTH

Group - 20

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Project Overview

Objectives:

- Enhance mental health insights
- Provide preventive measures and early care
- Ensure sustainability of initiatives

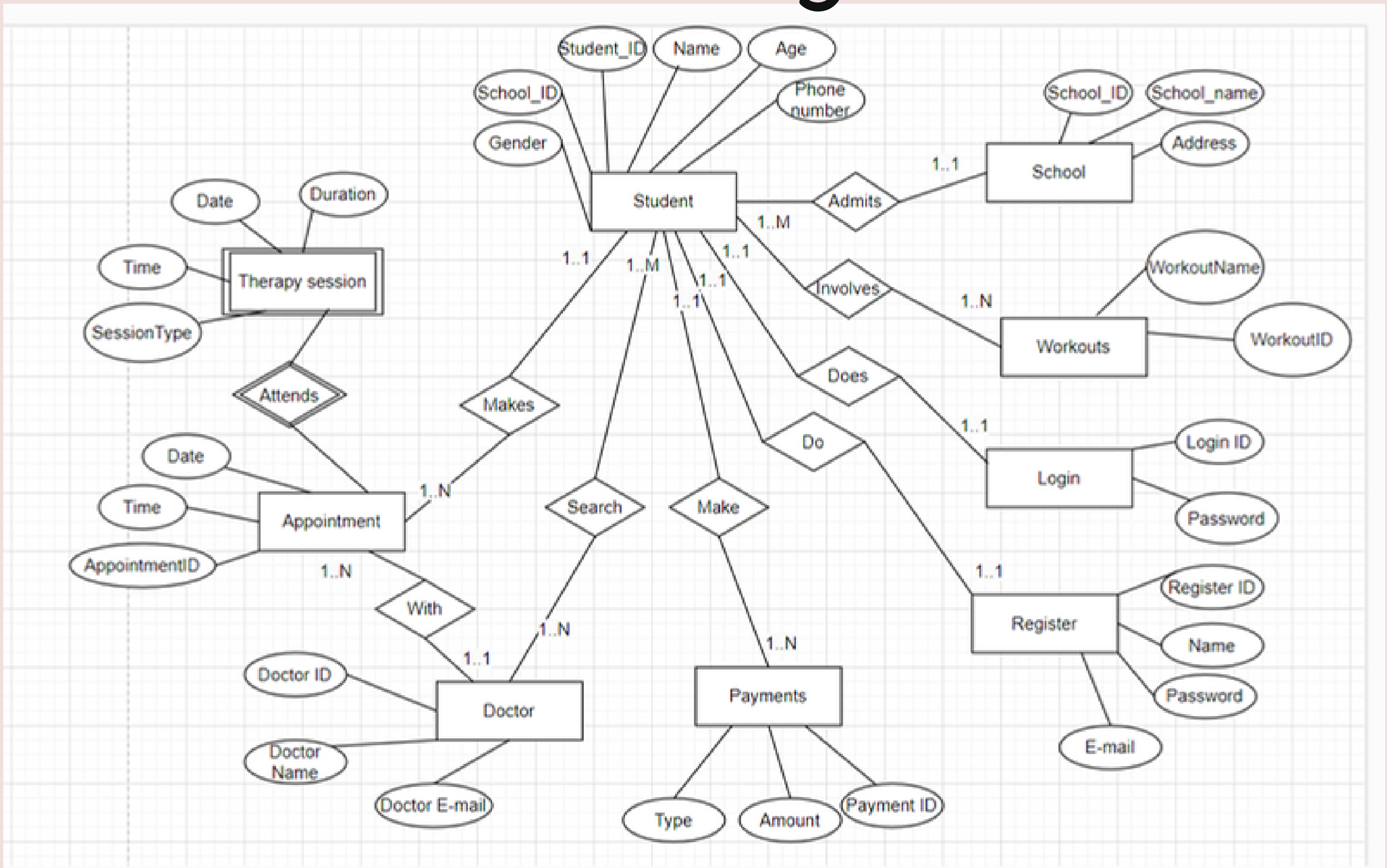
Web Application Features:

- Centralized student information storage
- Data collection on:
  - Student details
  - Mental health indicators
  - Lifestyle factors
  - Personal details
  - Activities
  - Financial stress and healthcare

Benefits:

- Insight generation through data analysis
- Targeted interventions based on trends
- Collaborative care with professionals
- Personalized well-being support for students

ERR Diagram


Student_ID
Name
Age
School_ID
Phone number
Gender
Student
Admits
1..1
1..M
School
School_ID
School_name
Address
Date
Duration
Time
Therapy session
SessionType
Attends
1..1
1..M
1..1
1..1
1..1
Involves
1..N
Workouts
WorkoutName
WorkoutID
Makes
Does
Do
1..1
Login
Login ID
Password
Date
Time
Appointment
AppointmentID
1..N
1..N
With
1..1
1..N
Search
Make
1..N
Doctor
Doctor ID
Doctor Name
Doctor E-mail
Payments
Type
Amount
Payment ID
1..1
Register
Register ID
Name
Password
E-mail

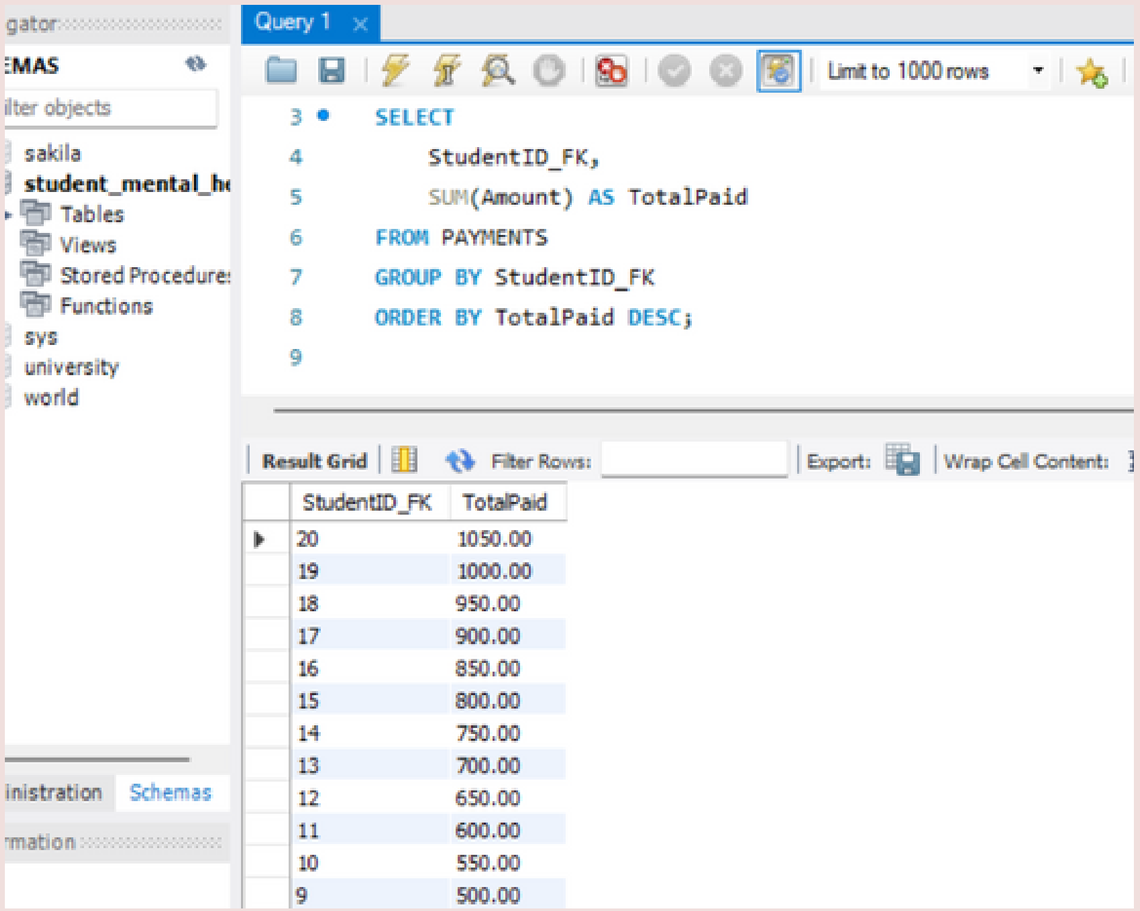
Relational Database

STUDENT: StudentID (PK), SchoolID_FK (FK to SCHOOL), UserID_FK (FK to LOGIN), Name, Age, PhoneNumber, Gender, Course, CreditLoad, GPA.
SCHOOL: SchoolID (PK), Name, Address.
WORKOUT: WorkoutID (PK), WorkoutName.
STUDENT_WORKOUTS: StudentID_FK (FK to STUDENT), WorkoutID_FK (FK to WORKOUT).
LOGIN: UserID (PK), PasswordHash.
REGISTER_C: RegisterID (PK), StudentID_FK (FK to STUDENT), Name, Email.
PAYMENTS: PaymentID (PK), StudentID_FK (FK to STUDENT), Amount, Type.
DOCTORS: DoctorID (PK), DoctorName, DoctorEmail.
STUDENT_DOCTOR: StudentID_FK (FK to STUDENT), DoctorID_FK (FK to DOCTORS).
APPOINTMENTS: AppointmentID (PK), StudentID_FK (FK to STUDENT), DoctorID_FK (FK to DOCTORS) , Date, Time.
THERAPY_SESSIONS: AppointmentID_FK (FK to APPOINTMENTS), Date, Duration, Time, SessionType.

MY SQL IMPLEMENTATION

Query 1 – how much total amount each student has paid, and order the students by the total amount paid in descending order

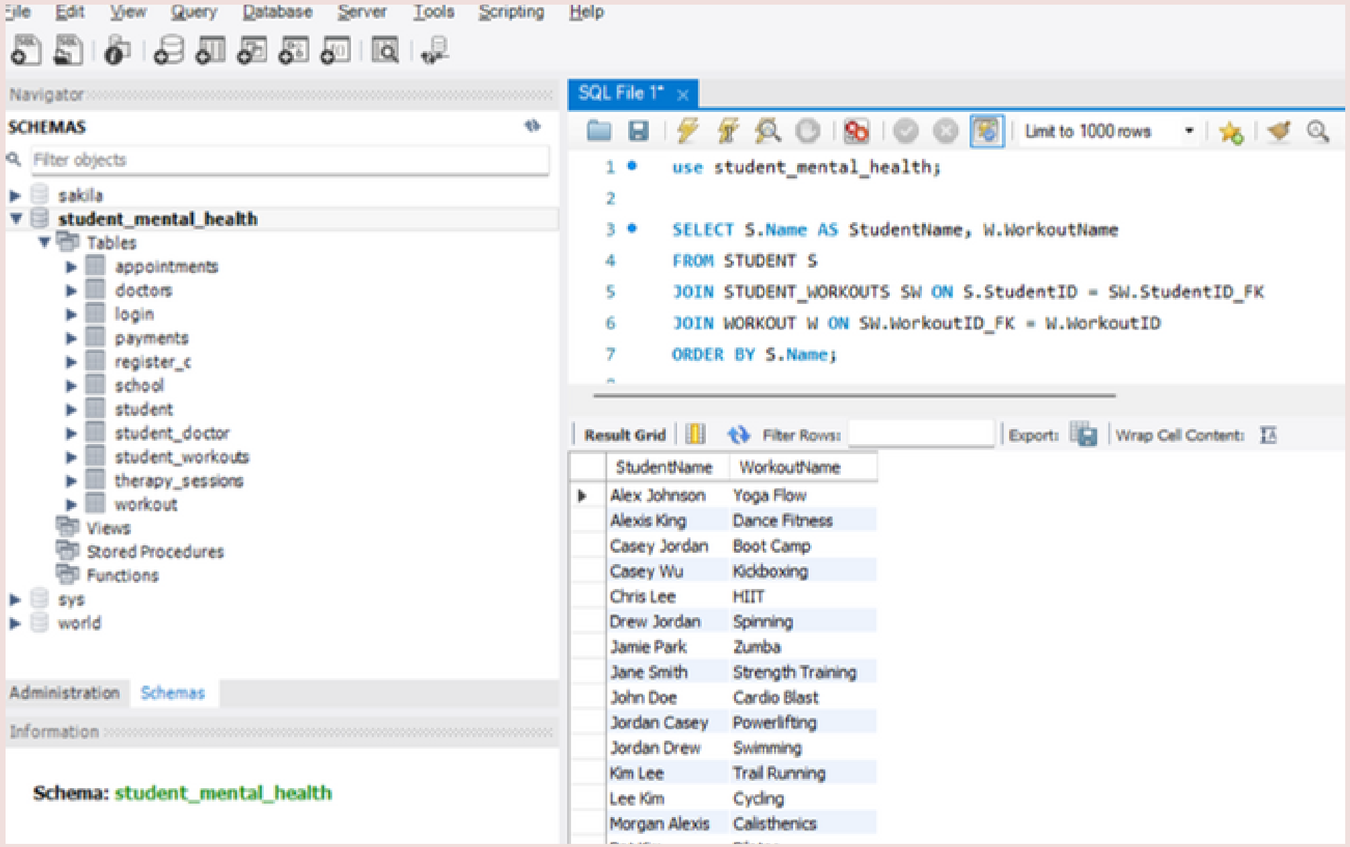
```
SELECT
    StudentID_FK,
    SUM(Amount) AS TotalPaid
FROM
    PAYMENTS
GROUP BY
    StudentID_FK
ORDER BY
    TotalPaid DESC;
```



MY SQL IMPLEMENTATION

Query 2 -.List all students with their workouts

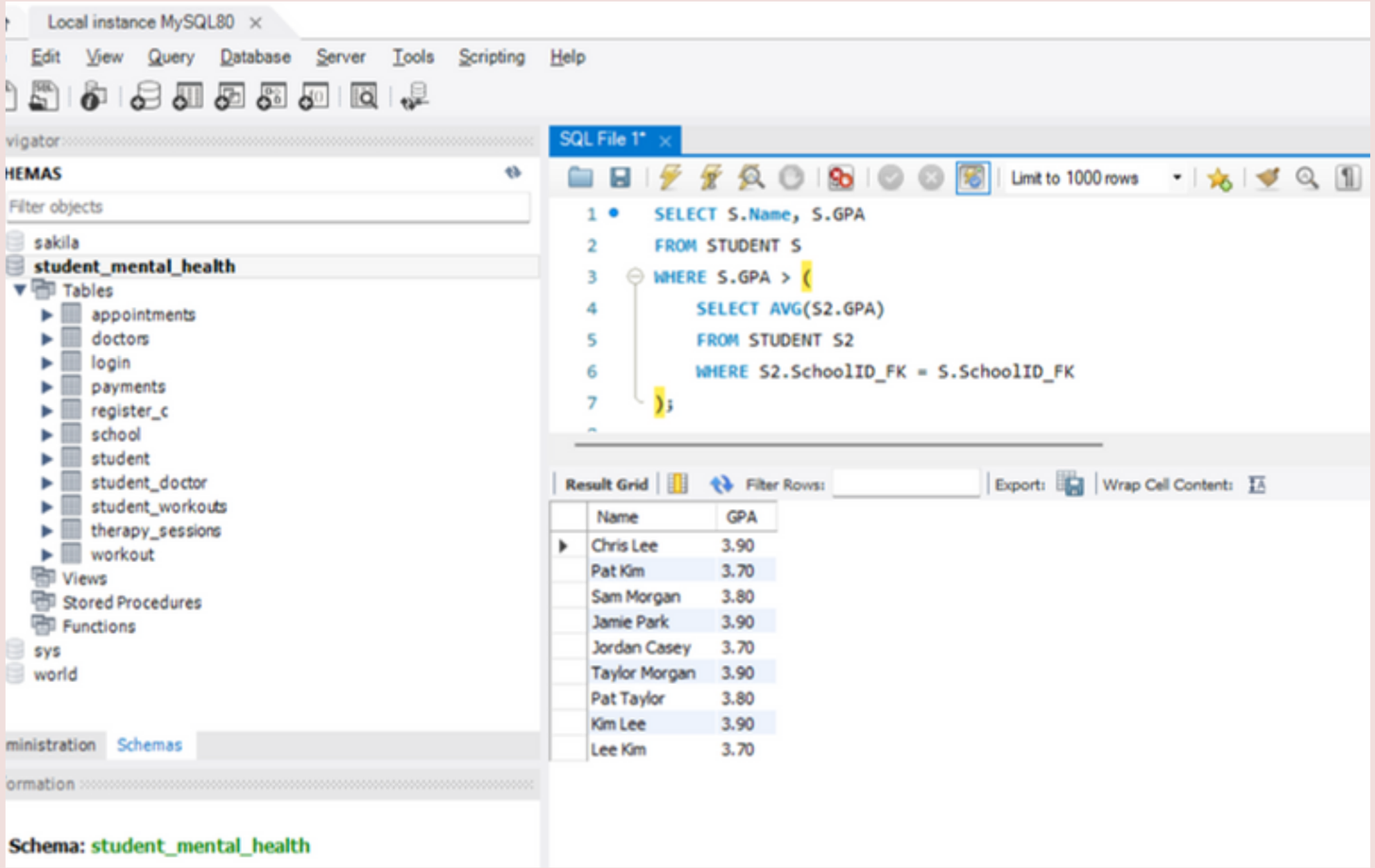
```
SELECT S.Name AS StudentName,
W.WorkoutName
FROM STUDENT S
JOIN STUDENT_WORKOUTS SW ON
S.StudentID = SW.StudentID_FK
JOIN WORKOUT W ON SW.WorkoutID_FK =
W.WorkoutID
ORDER BY S.Name;
```



MY SQL IMPLEMENTATION

Query 3 List students and their GPAs if they are above the average GPA of their school

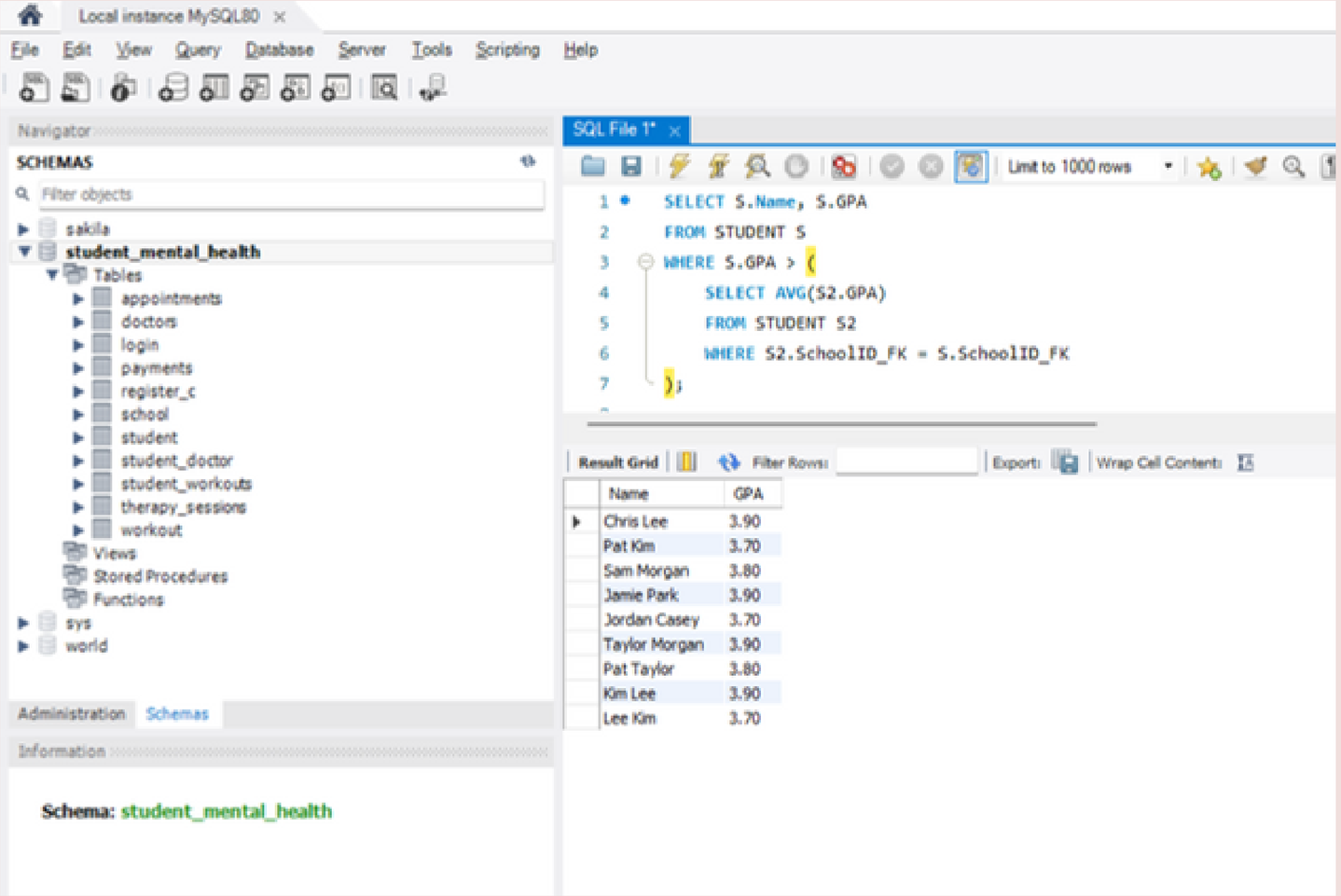
```
SELECT S.Name, S.GPA
FROM STUDENT S
WHERE S.GPA > (
SELECT AVG(S2.GPA)
FROM STUDENT S2
WHERE S2.SchoolID_FK = S.SchoolID_FK
);
```



MY SQL IMPLEMENTATION

Query 4 Find workouts that have been attended by at least one student

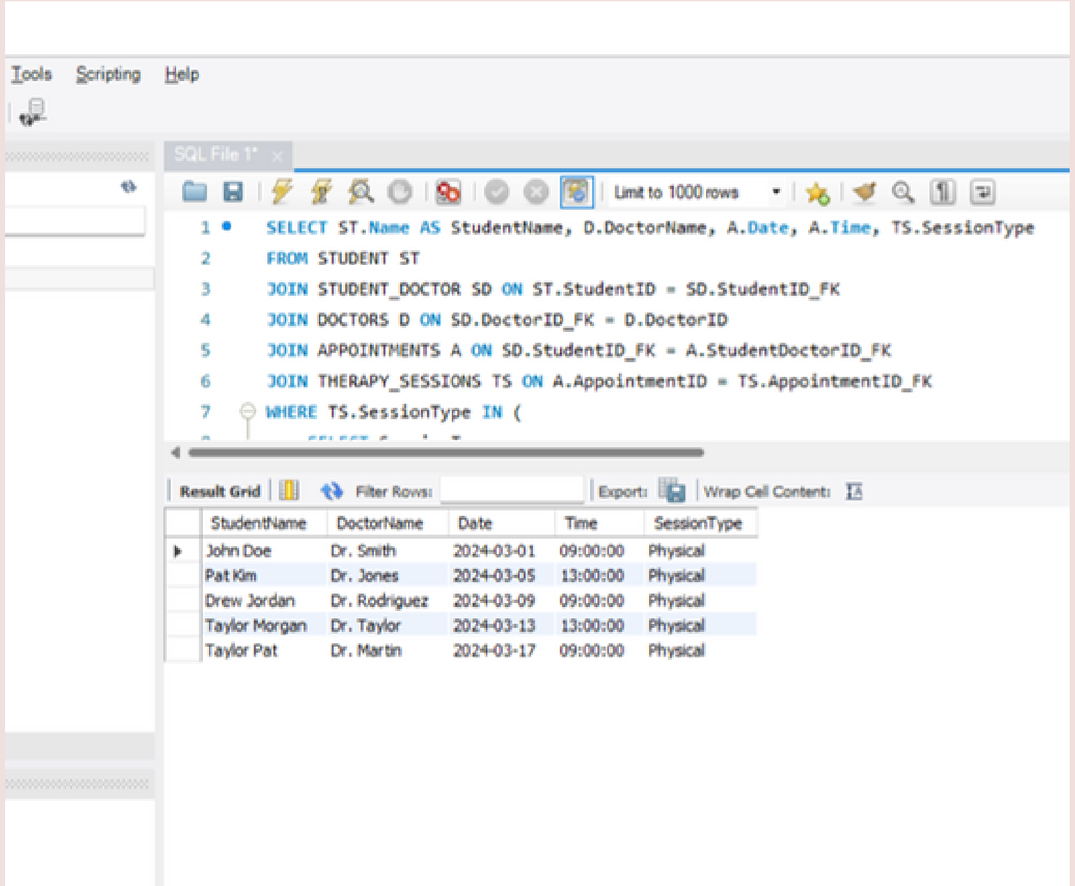
```
SELECT W.WorkoutName
FROM WORKOUT W
WHERE EXISTS (
SELECT StudentID
FROM STUDENT_WORKOUTS SW
WHERE SW.WorkoutID_FK = W.WorkoutID );
```



MY SQL IMPLEMENTATION

Query 5 List students, their doctors, and appointment details for a specific type of therapy session

```
SELECT ST.Name AS StudentName, D.DoctorName, A.Date, A.Time,
TS.SessionType
FROM STUDENT ST
JOIN STUDENT_DOCTOR SD ON ST.StudentID = SD.StudentID_FK
JOIN DOCTORS D ON SD.DoctorID_FK = D.DoctorID
JOIN APPOINTMENTS A ON SD.StudentID_FK =
A.StudentDoctorID_FK
JOIN THERAPY_SESSIONS TS ON A.AppointmentID =
TS.AppointmentID_FK
WHERE TS.SessionType IN (
SELECT SessionType
FROM THERAPY_SESSIONS
WHERE SessionType = 'Physical' )
ORDER BY A.Date, A.Time;
```



StudentName	DoctorName	Date	Time	SessionType
John Doe	Dr. Smith	2024-03-01	09:00:00	Physical
Pat Kim	Dr. Jones	2024-03-05	13:00:00	Physical
Drew Jordan	Dr. Rodriguez	2024-03-09	09:00:00	Physical
Taylor Morgan	Dr. Taylor	2024-03-13	13:00:00	Physical
Taylor Pat	Dr. Martin	2024-03-17	09:00:00	Physical

PYTHON IMPLEMENTATION

```
In [3]:  import mysql.connector
         from mysql.connector import Error

In [4]:  connection = mysql.connector.connect(host=' localhost',
                                              database='student_mental_health',
                                              user='root',
                                              password='new_password',
                                              auth_plugin='mysql_native_password')

In [5]:  connection

Out[5]: <mysql.connector.connection_cext.CMySQLConnection at 0x20d7b450970>

In [8]:  if connection.is_connected():
             db_Info = connection.get_server_info()
             print("Connected to MySQL Server version ", db_Info)
             cursor = connection.cursor()
             cursor.execute("select database();")
             record = cursor.fetchone()
             print("Your connected to database: ", record)

         Connected to MySQL Server version  8.0.23
         Your connected to database:  ('student_mental_health',)
```

Retrieving tables from DataBase

```python
query = "SELECT * FROM student"
cursor.execute(query)

# Fetch all rows from the result set
data = cursor.fetchall()

# Create a DataFrame from the fetched data
columns = [desc[0] for desc in cursor.description]
df = pd.DataFrame(data, columns=columns)

print(df)
```

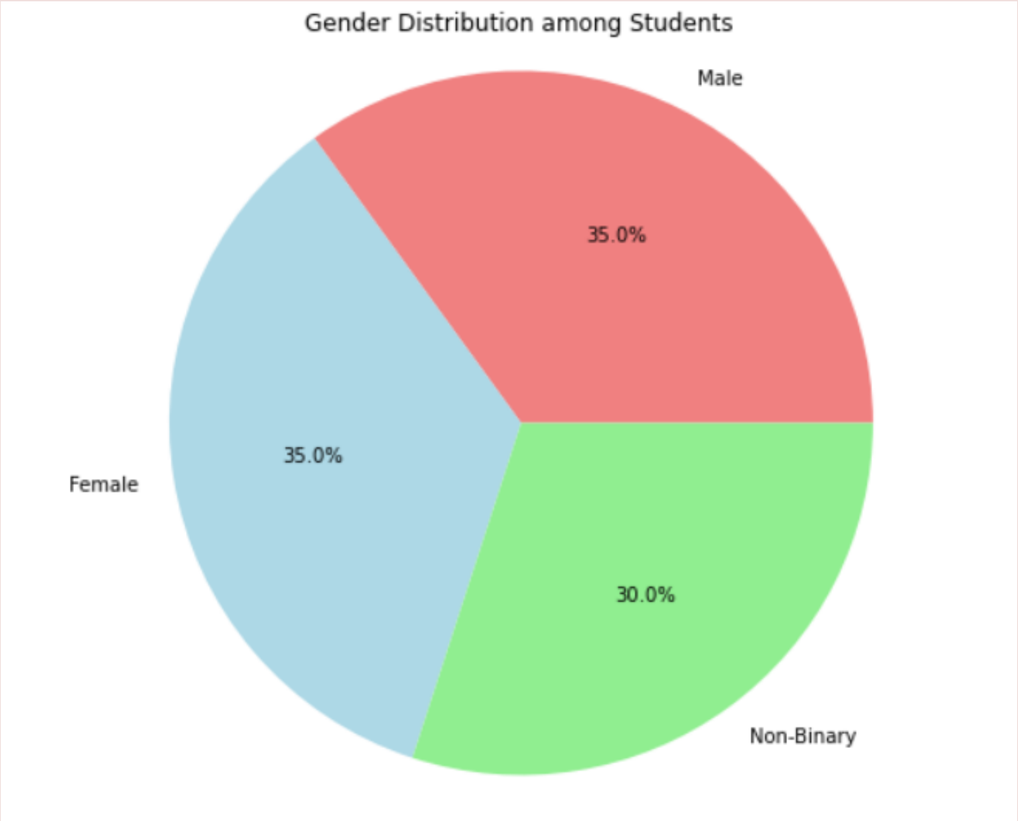
```
<IPython.core.display.Javascript object>

    StudentID  SchoolID_FK  UserID_FK           Name  A
0           1            1          1       John Doe
1           2            2          2     Jane Smith
2           3            3          3   Alex Johnson
3           4            4          4      Chris Lee
4           5            5          5        Pat Kim
5           6            1          6     Sam Morgan
6           7            2          7     Jamie Park
7           8            3          8       Casey Wu
8           9            4          9    Drew Jordan
9          10            5         10   Robin Taylor
10         11            1         11   Jordan Casey
```

```python
def select_query():
        sql_select_Query = "select * from student"
        cursor = connection.cursor()
        cursor.execute(sql_select_Query)
        records = cursor.fetchall()
        print("Students  in the garace list and details will be :\n")
        for row in records:
            print('Students_table each row =', row, "\n")


select_query()
```

```
Students  in the garace list and details will be :

Students_table each row = (1, 1, 1, 'John Doe', 20, '555-0001', 'Male', '
```

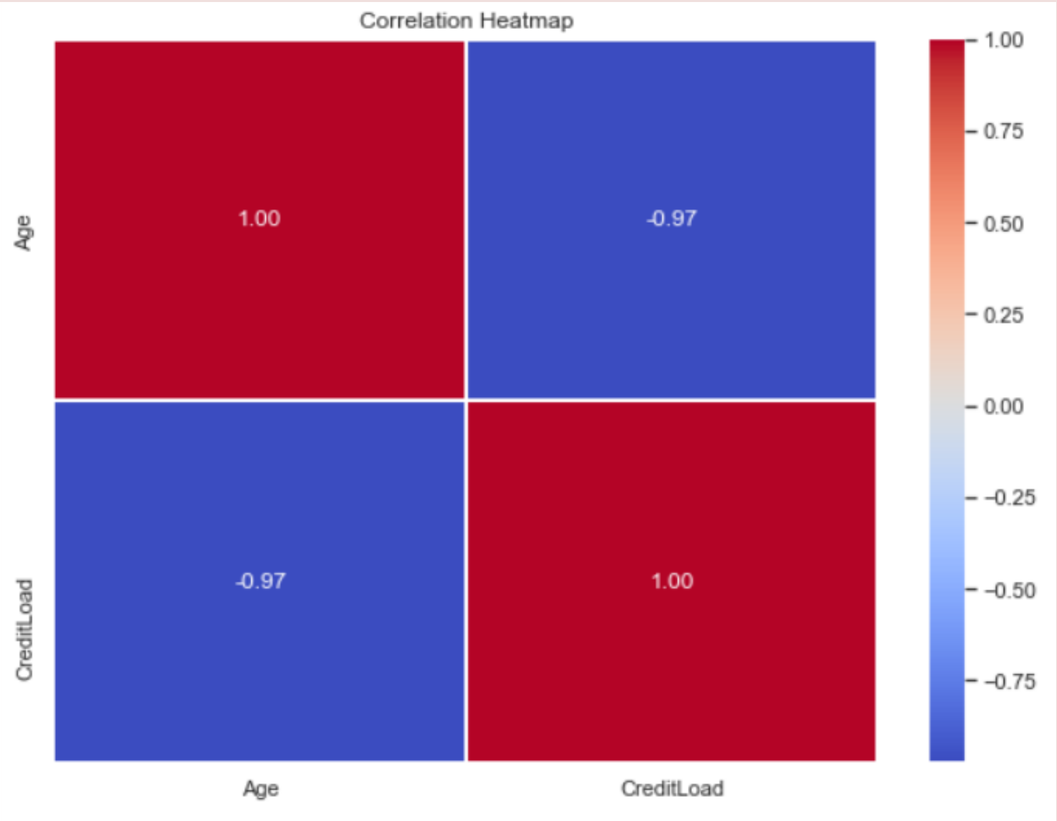
Gender Distribution among Students

```
# Pie Chart
gender_counts = df['Gender'].value_counts()
plt.figure(figsize=(8, 6))
plt.pie(gender_counts, labels=gender_counts.index,
        autopct='%1.1f%%',
        colors=['lightcoral', 'lightblue', 'lightgreen'])
plt.title('Gender Distribution among Students')
plt.axis('equal')
plt.tight_layout()
plt.show()
```

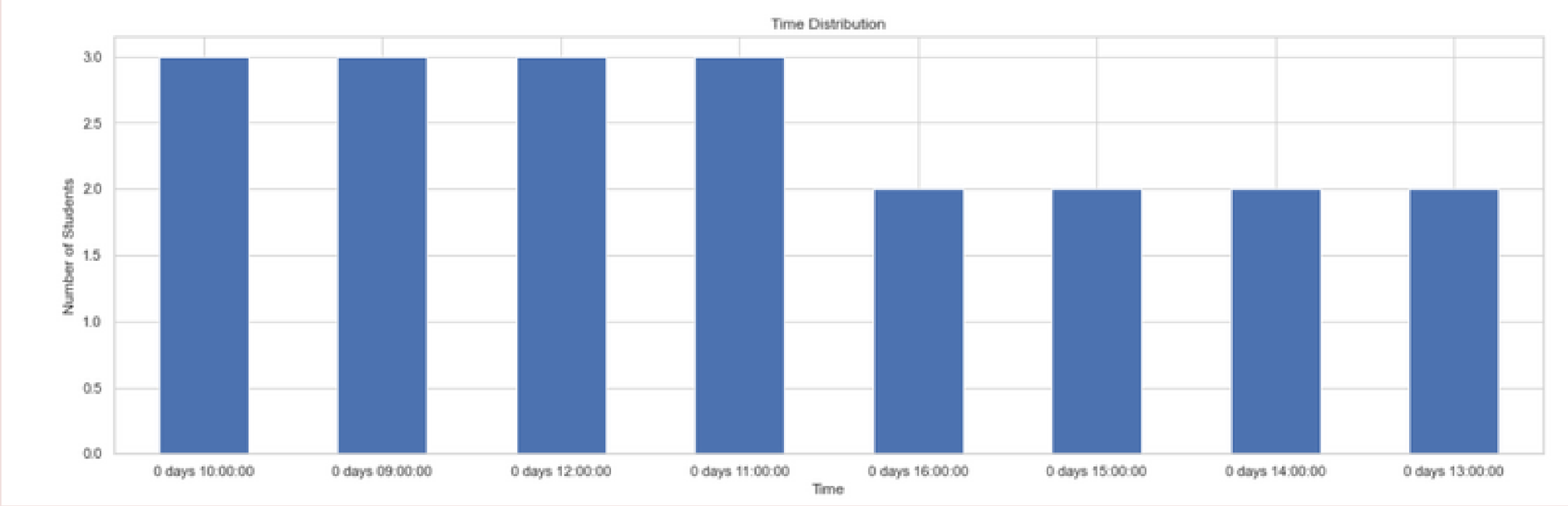


Correlation Heatmap

```python
import seaborn as sns

# Calculate correlation matrix
correlation_matrix = df[
    ['Age', 'CreditLoad', 'GPA']].corr()

# Plot heatmap
plt.figure(figsize=(8, 6))
sns.heatmap(correlation_matrix, annot=True,
            cmap='coolwarm', fmt=".2f", linewidths=0.5)
plt.title('Correlation Heatmap')
plt.tight_layout()
plt.show()
```



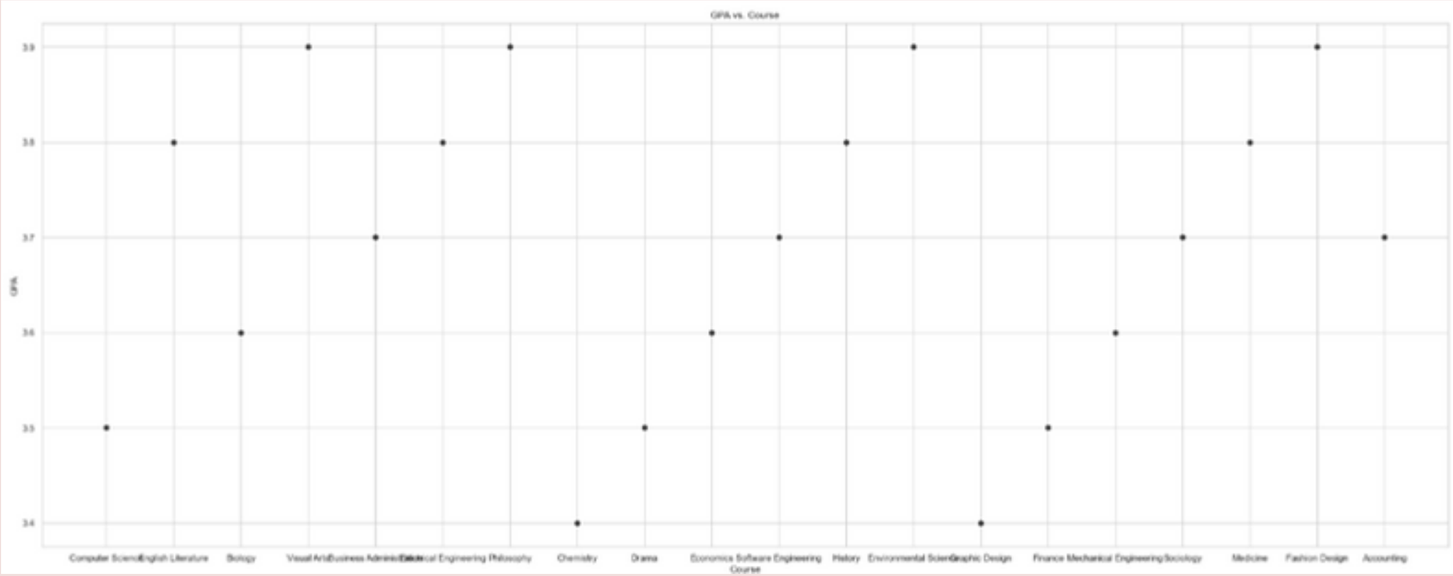
Time Distribution



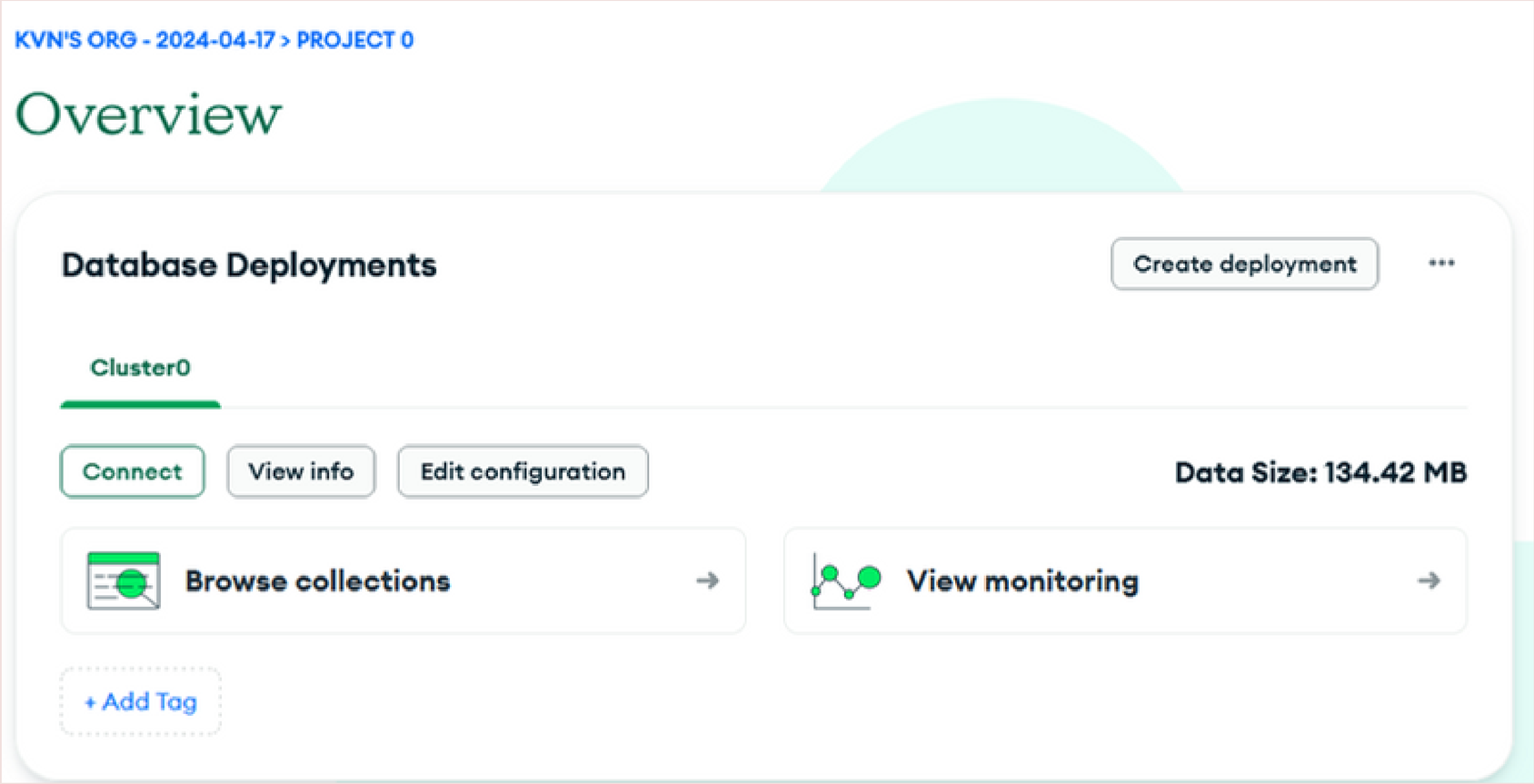

```
plt.figure(figsize=(20, 6))
gender_counts = df2['Time'].value_counts()
gender_counts.plot(kind='bar')
plt.title('Time Distribution')
plt.xlabel('Time')
plt.ylabel('Number of Students')
plt.xticks(rotation=0)
```

GPA vs. Course

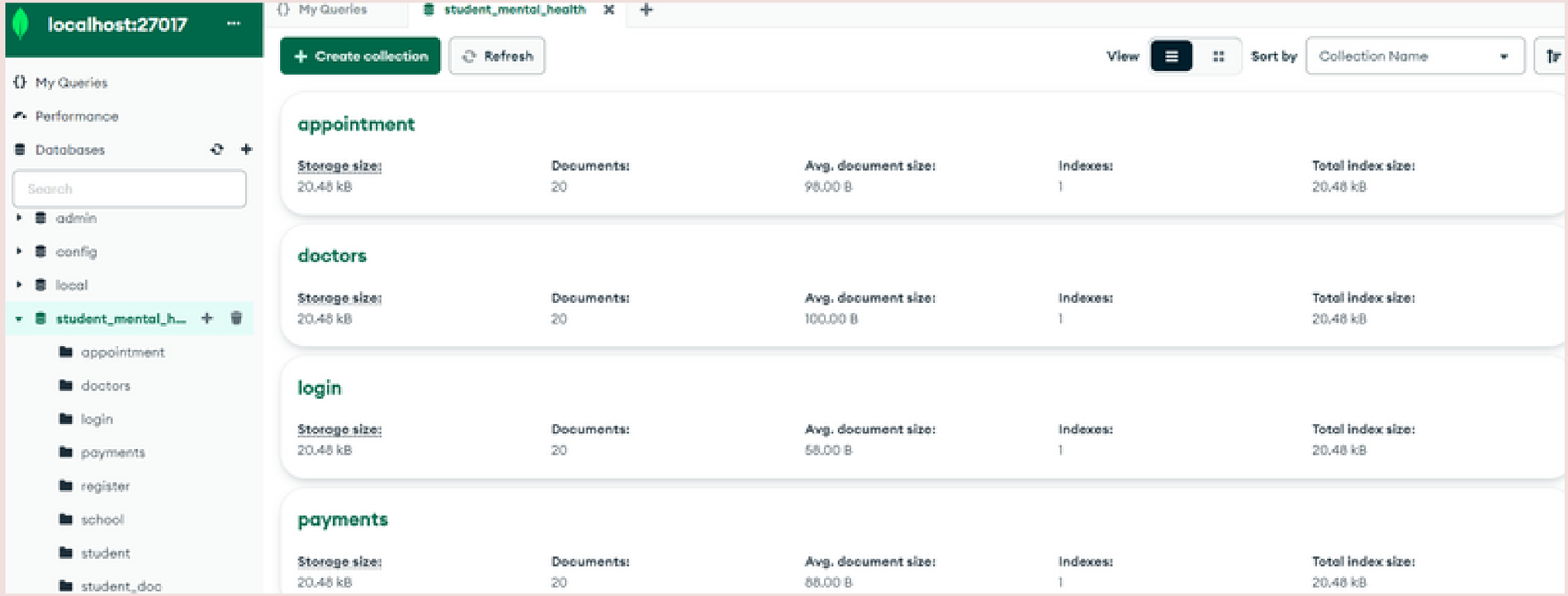
```
# Scatter Plot
plt.figure(figsize=(25, 10))
plt.scatter(df['Course'], df['GPA'],
            color='black', alpha=0.7)
plt.xlabel('Course')
plt.ylabel('GPA')
plt.title('GPA vs. Course')
plt.grid(True)
plt.tight_layout()
plt.show()
```



NoSQL IMPLEMENTATION



NoSQL Collections created on MongoDB for all the MySQL tables as shown



Finding Male Students

```
> db.student.find({"Gender":"Male"});
< {
    _id: ObjectId("661ca5f3389e0c978178b79c"),
    StudentID: 1,
    SchoolID_FK: 1,
    UserID_FK: 1,
    Name: 'John Doe',
    Age: 20,
    PhoneNumber: '555-0001',
    Gender: 'Male',
    Course: 'Computer Science',
    CreditLoad: 15,
    GPA: 3.5
  }
  {
    _id: ObjectId("661ca5f3389e0c978178b79f"),
    StudentID: 4,
    SchoolID_FK: 4,
    UserID_FK: 4,
    Name: 'Chris Lee',
```

Finding students whose age is above 20

```
> db.student.find({ "Age": { $gt:20 } });
< {
    _id: ObjectId("661ca5f3389e0c978178b79d"),
    StudentID: 2,
    SchoolID_FK: 2,
    UserID_FK: 2,
    Name: 'Jane Smith',
    Age: 22,
    PhoneNumber: '555-0002',
    Gender: 'Female',
    Course: 'English Literature',
    CreditLoad: 12,
    GPA: 3.8
  }
  {
    _id: ObjectId("661ca5f3389e0c978178b79f"),
    StudentID: 4,
    SchoolID_FK: 4,
    UserID_FK: 4,
    Name: 'Chris Lee',
    Age: 21,
    PhoneNumber: '555-0004',
    Gender: 'Male',
    Course: 'Visual Arts',
    CreditLoad: 14,
    GPA: 3.9
```

Finding students whose GPA is above 3.5

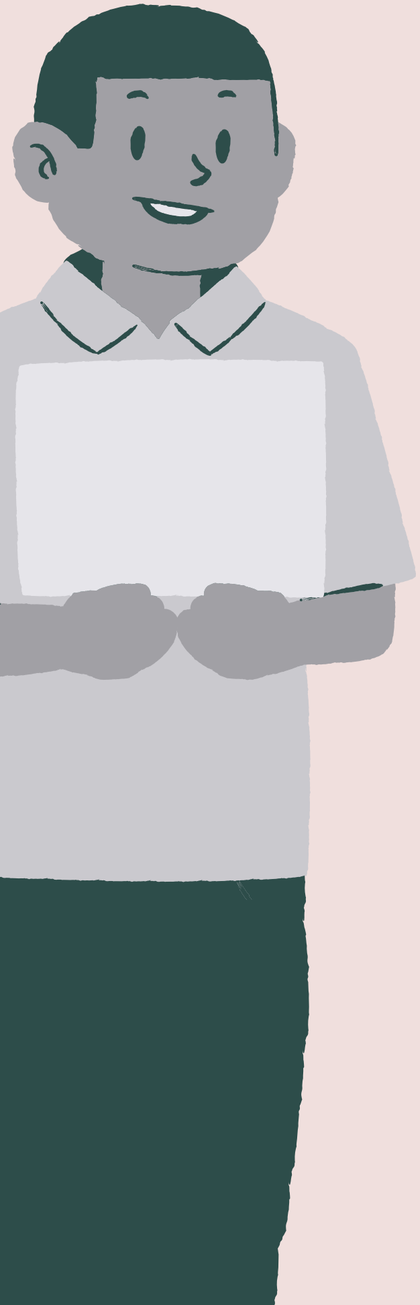
```
> db.student.find({ "GPA": { $gt:3.5 } });
< {
    _id: ObjectId("661ca5f3389e0c978178b79d"),
    StudentID: 2,
    SchoolID_FK: 2,
    UserID_FK: 2,
    Name: 'Jane Smith',
    Age: 22,
    PhoneNumber: '555-0002',
    Gender: 'Female',
    Course: 'English Literature',
    CreditLoad: 12,
    GPA: 3.8
  }
  {
    _id: ObjectId("661ca5f3389e0c978178b79e"),
    StudentID: 3,
    SchoolID_FK: 3,
    UserID_FK: 3,
    Name: 'Alex Johnson',
    Age: 19,
    PhoneNumber: '555-0003',
    Gender: 'Non-Binary',
    Course: 'Biology',
    CreditLoad: 16,
    GPA: 3.6
```

Counting number of students based on their gender

```
> db.student.aggregate([ { $group: { _id: "$Gender", total: { $sum: 1 } } }] )
< {
    _id: 'Male',
    total: 7
  }
  {
    _id: 'Female',
    total: 7
  }
  {
    _id: 'Non-Binary',
    total: 6
  }
```

Students whose name starts with A

```
> db.student.find({Name: /^A/ })
< {
    _id: ObjectId("661ca5f3389e0c978178b79e"),
    StudentID: 3,
    SchoolID_FK: 3,
    UserID_FK: 3,
    Name: 'Alex Johnson',
    Age: 19,
    PhoneNumber: '555-0003',
    Gender: 'Non-Binary',
    Course: 'Biology',
    CreditLoad: 16,
    GPA: 3.6
  }
  {
    _id: ObjectId("661ca5f3389e0c978178b7a7"),
    StudentID: 12,
    SchoolID_FK: 2,
    UserID_FK: 12,
    Name: 'Alexis King',
    Age: 22,
    PhoneNumber: '555-0012',
    Gender: 'Non-Binary',
    Course: 'History',
    CreditLoad: 12,
    GPA: 3.8
```



THANK YOU

Your support is truly appreciated. Goodbye!