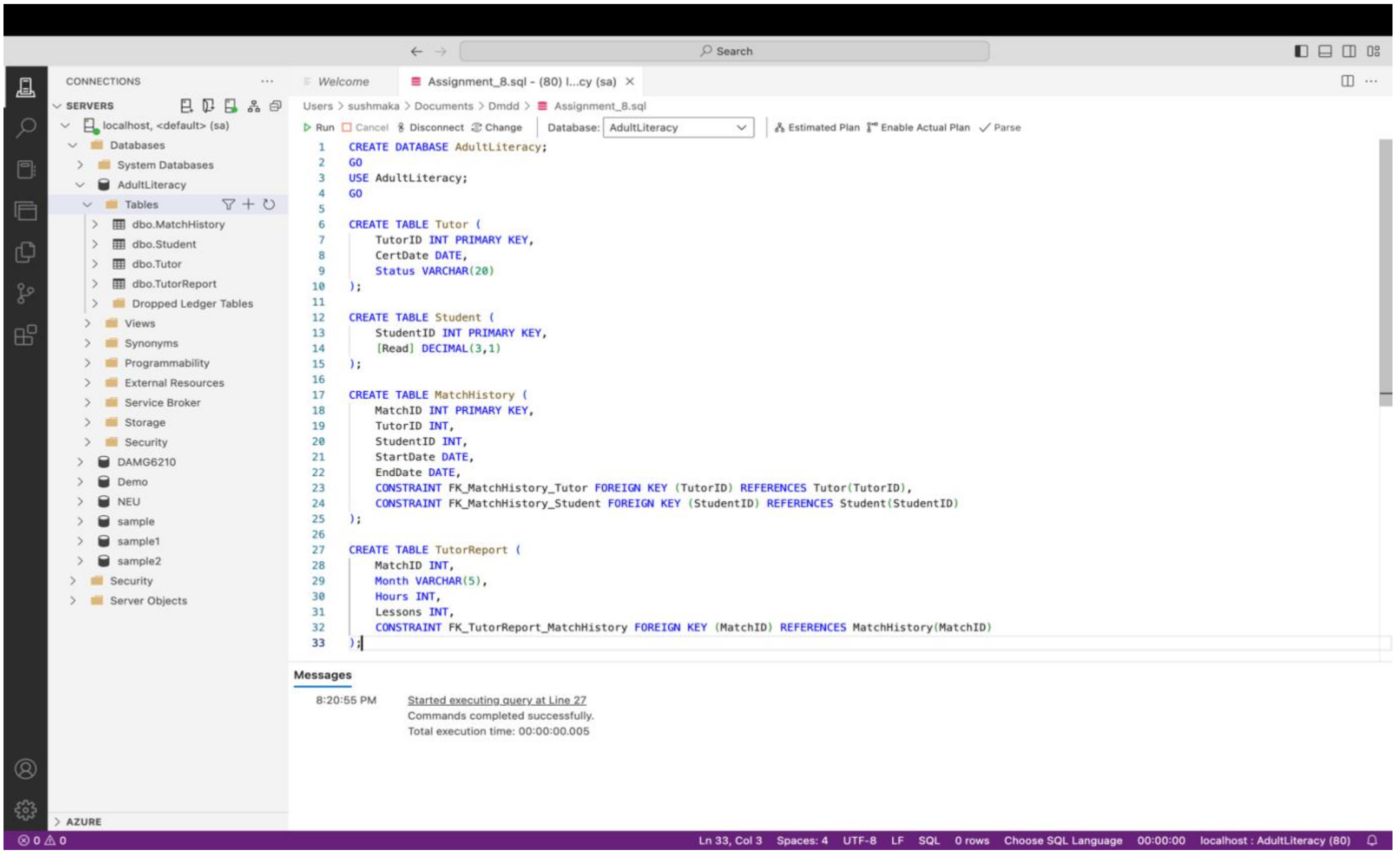
DAMG6210 - Data Management and Database Design

Homework 08

1.

```
CREATE DATABASE AdultLiteracy;
GO
USE AdultLiteracy;
GO

CREATE TABLE Tutor (
   TutorID INT PRIMARY KEY,
   CertDate DATE,
   Status VARCHAR(20)
);

CREATE TABLE Student (
   StudentID INT PRIMARY KEY,
   [Read] DECIMAL(3,1)
);

CREATE TABLE MatchHistory (
   MatchID INT PRIMARY KEY,
   TutorID INT,
   StudentID INT,
   StartDate DATE,
   EndDate DATE,
   CONSTRAINT FK_MatchHistory_Tutor FOREIGN KEY (TutorID) REFERENCES
Tutor(TutorID),
   CONSTRAINT FK_MatchHistory_Student FOREIGN KEY (StudentID) REFERENCES
Student(StudentID)
);
```

```
CREATE TABLE TutorReport (
   MatchID INT,
   Month VARCHAR(5),
   Hours INT,
   Lessons INT,
   CONSTRAINT FK_TutorReport_MatchHistory FOREIGN KEY (MatchID) REFERENCES MatchHistory(MatchID)
);
```



```sql
CREATE DATABASE AdultLiteracy;
GO
USE AdultLiteracy;
GO

CREATE TABLE Tutor (
    TutorID INT PRIMARY KEY,
    CertDate DATE,
    Status VARCHAR(20)
);

CREATE TABLE Student (
    StudentID INT PRIMARY KEY,
    [Read] DECIMAL(3,1)
);

CREATE TABLE MatchHistory (
    MatchID INT PRIMARY KEY,
    TutorID INT,
    StudentID INT,
    StartDate DATE,
    EndDate DATE,
    CONSTRAINT FK_MatchHistory_Tutor FOREIGN KEY (TutorID) REFERENCES Tutor(TutorID),
    CONSTRAINT FK_MatchHistory_Student FOREIGN KEY (StudentID) REFERENCES Student(StudentID)
);

CREATE TABLE TutorReport (
    MatchID INT,
    Month VARCHAR(5),
    Hours INT,
    Lessons INT,
    CONSTRAINT FK_TutorReport_MatchHistory FOREIGN KEY (MatchID) REFERENCES MatchHistory(MatchID)
);
```

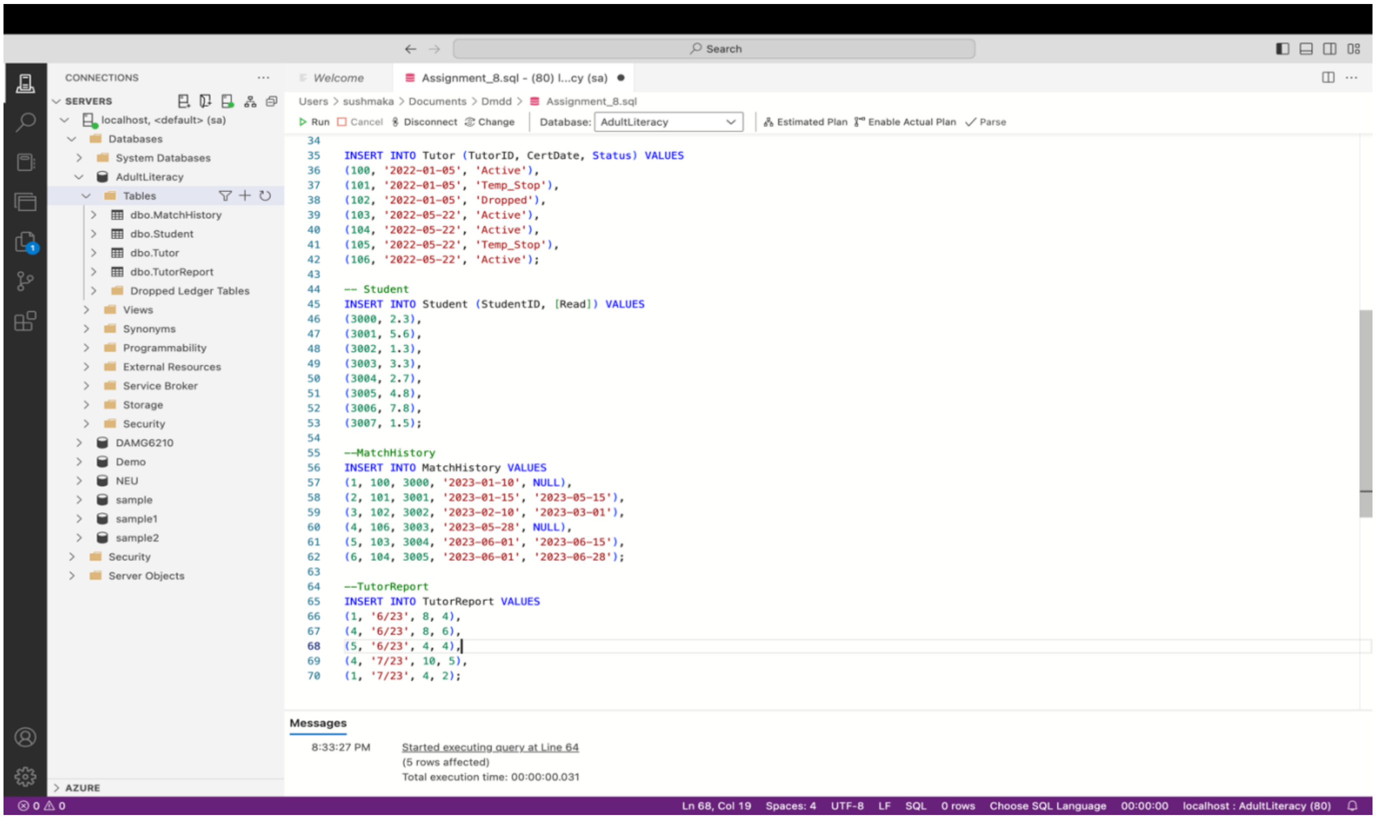
Messages

```
8:20:55 PM     Started executing query at Line 27
               Commands completed successfully.
               Total execution time: 00:00:00.005
```

2.

```
INSERT INTO Tutor (TutorID, CertDate, Status) VALUES
(100, '2022-01-05', 'Active'),
(101, '2022-01-05', 'Temp_Stop'),
(102, '2022-01-05', 'Dropped'),
(103, '2022-05-22', 'Active'),
(104, '2022-05-22', 'Active'),
(105, '2022-05-22', 'Temp_Stop'),
(106, '2022-05-22', 'Active');

-- Student
INSERT INTO Student (StudentID, [Read]) VALUES
(3000, 2.3),
(3001, 5.6),
(3002, 1.3),
(3003, 3.3),
(3004, 2.7),
(3005, 4.8),
(3006, 7.8),
(3007, 1.5);

--MatchHistory
INSERT INTO MatchHistory VALUES
(1, 100, 3000, '2023-01-10', NULL),
(2, 101, 3001, '2023-01-15', '2023-05-15'),
(3, 102, 3002, '2023-02-10', '2023-03-01'),
(4, 106, 3003, '2023-05-28', NULL),
(5, 103, 3004, '2023-06-01', '2023-06-15'),
(6, 104, 3005, '2023-06-01', '2023-06-28');

--TutorReport
INSERT INTO TutorReport VALUES
(1, '6/23', 8, 4),
(4, '6/23', 8, 6),
(5, '6/23', 4, 4),
(4, '7/23', 10, 5),
```

(1, '7/23', 4, 2);



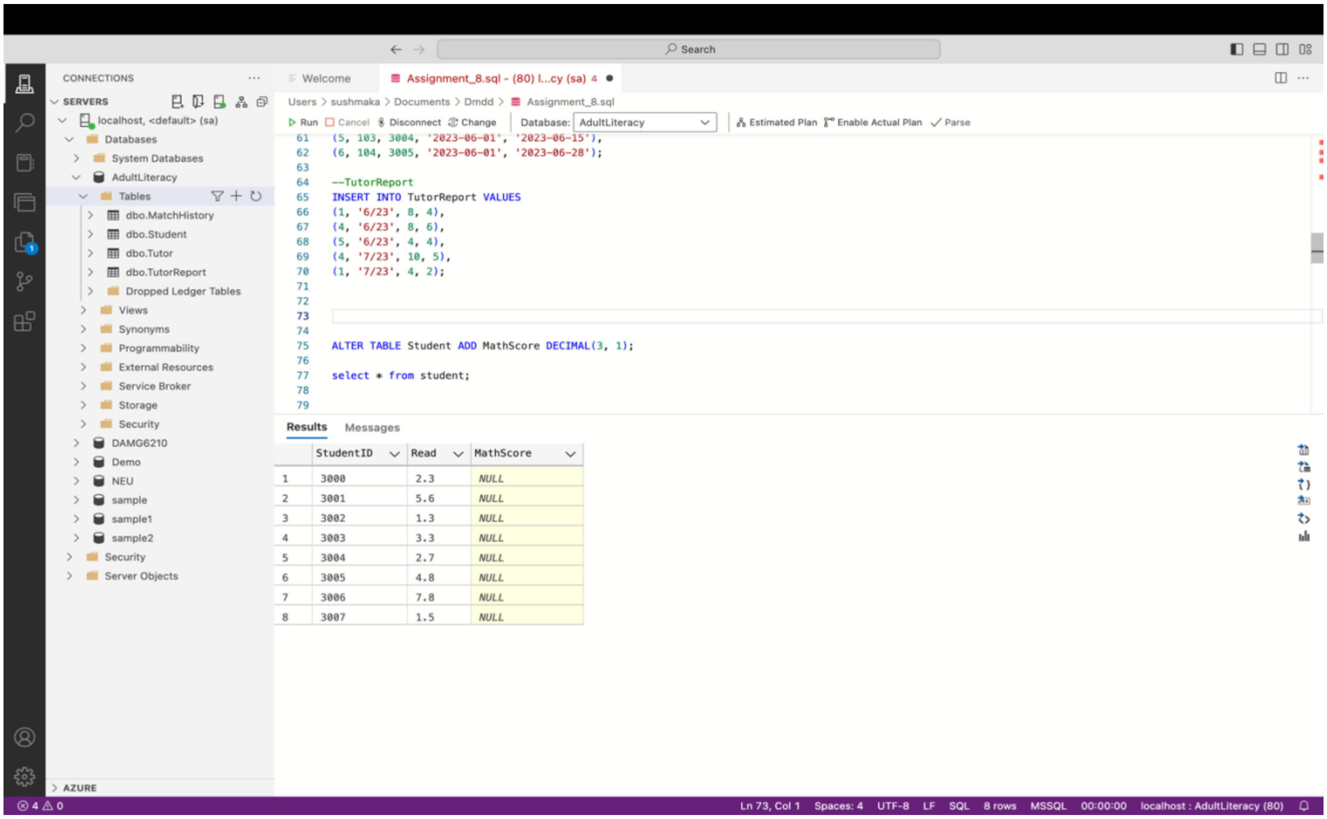
Database: AdultLiteracy

```
34
35   INSERT INTO Tutor (TutorID, CertDate, Status) VALUES
36   (100, '2022-01-05', 'Active'),
37   (101, '2022-01-05', 'Temp_Stop'),
38   (102, '2022-01-05', 'Dropped'),
39   (103, '2022-05-22', 'Active'),
40   (104, '2022-05-22', 'Active'),
41   (105, '2022-05-22', 'Temp_Stop'),
42   (106, '2022-05-22', 'Active');
43
44   -- Student
45   INSERT INTO Student (StudentID, [Read]) VALUES
46   (3000, 2.3),
47   (3001, 5.6),
48   (3002, 1.3),
49   (3003, 3.3),
50   (3004, 2.7),
51   (3005, 4.8),
52   (3006, 7.8),
53   (3007, 1.5);
54
55   --MatchHistory
56   INSERT INTO MatchHistory VALUES
57   (1, 100, 3000, '2023-01-10', NULL),
58   (2, 101, 3001, '2023-01-15', '2023-05-15'),
59   (3, 102, 3002, '2023-02-10', '2023-03-01'),
60   (4, 106, 3003, '2023-05-28', NULL),
61   (5, 103, 3004, '2023-06-01', '2023-06-15'),
62   (6, 104, 3005, '2023-06-01', '2023-06-28');
63
64   --TutorReport
65   INSERT INTO TutorReport VALUES
66   (1, '6/23', 8, 4),
67   (4, '6/23', 8, 6),
68   (5, '6/23', 4, 4),
69   (4, '7/23', 10, 5),
70   (1, '7/23', 4, 2);
```

```
8:33:27 PM    Started executing query at Line 64
              (5 rows affected)
              Total execution time: 00:00:00.031
```

3.

ALTER TABLE Student ADD MathScore DECIMAL(3, 1);



```sql
(5, 103, 3004, '2023-06-01', '2023-06-15'),
(6, 104, 3005, '2023-06-01', '2023-06-28');

--TutorReport
INSERT INTO TutorReport VALUES
(1, '6/23', 8, 4),
(4, '6/23', 8, 6),
(5, '6/23', 4, 4),
(4, '7/23', 10, 5),
(1, '7/23', 4, 2);



ALTER TABLE Student ADD MathScore DECIMAL(3, 1);

select * from student;
```

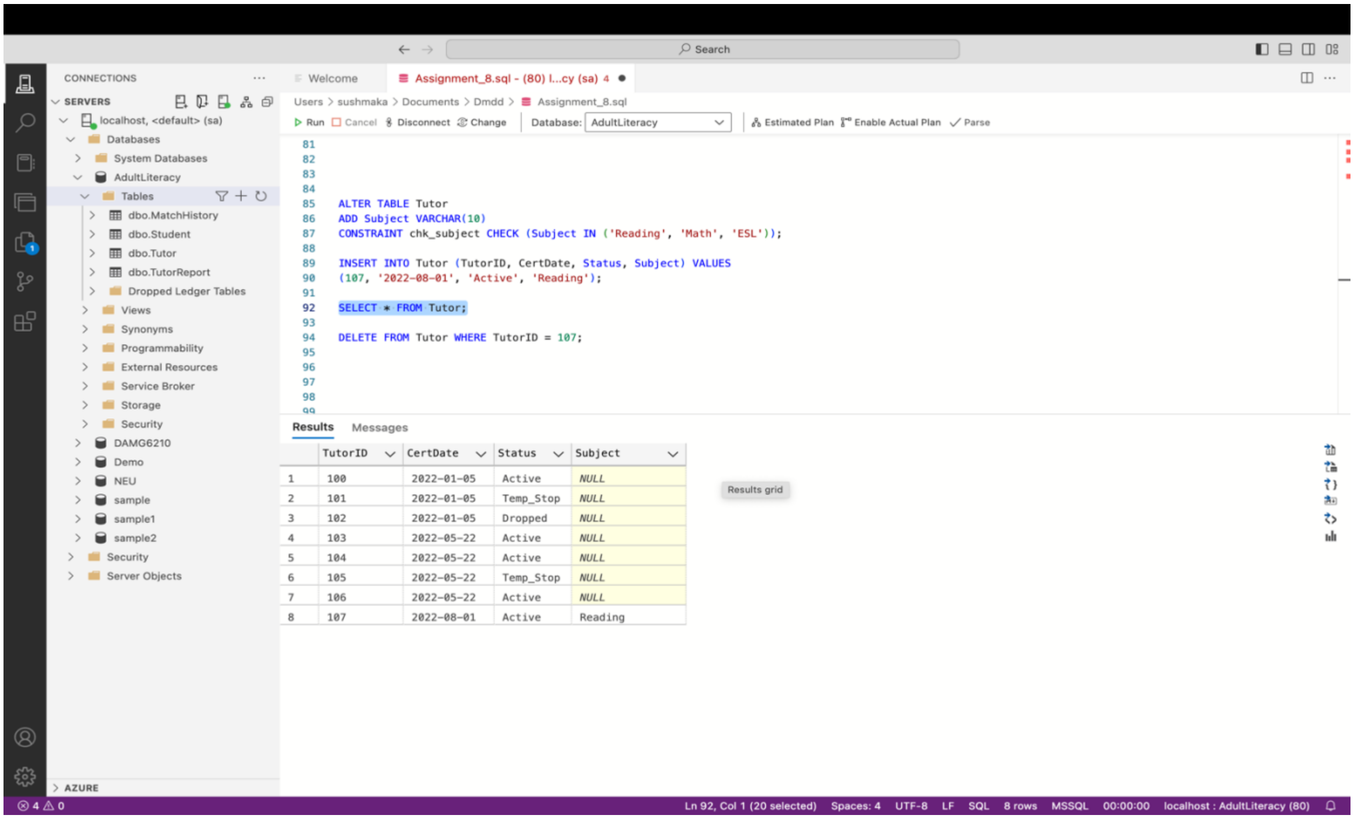
	StudentID	Read	MathScore
1	3000	2.3	NULL
2	3001	5.6	NULL
3	3002	1.3	NULL
4	3003	3.3	NULL
5	3004	2.7	NULL
6	3005	4.8	NULL
7	3006	7.8	NULL
8	3007	1.5	NULL

4.

ALTER TABLE Tutor

ADD Subject VARCHAR(10)

CONSTRAINT chk_subject CHECK (Subject IN ('Reading', 'Math', 'ESL'));

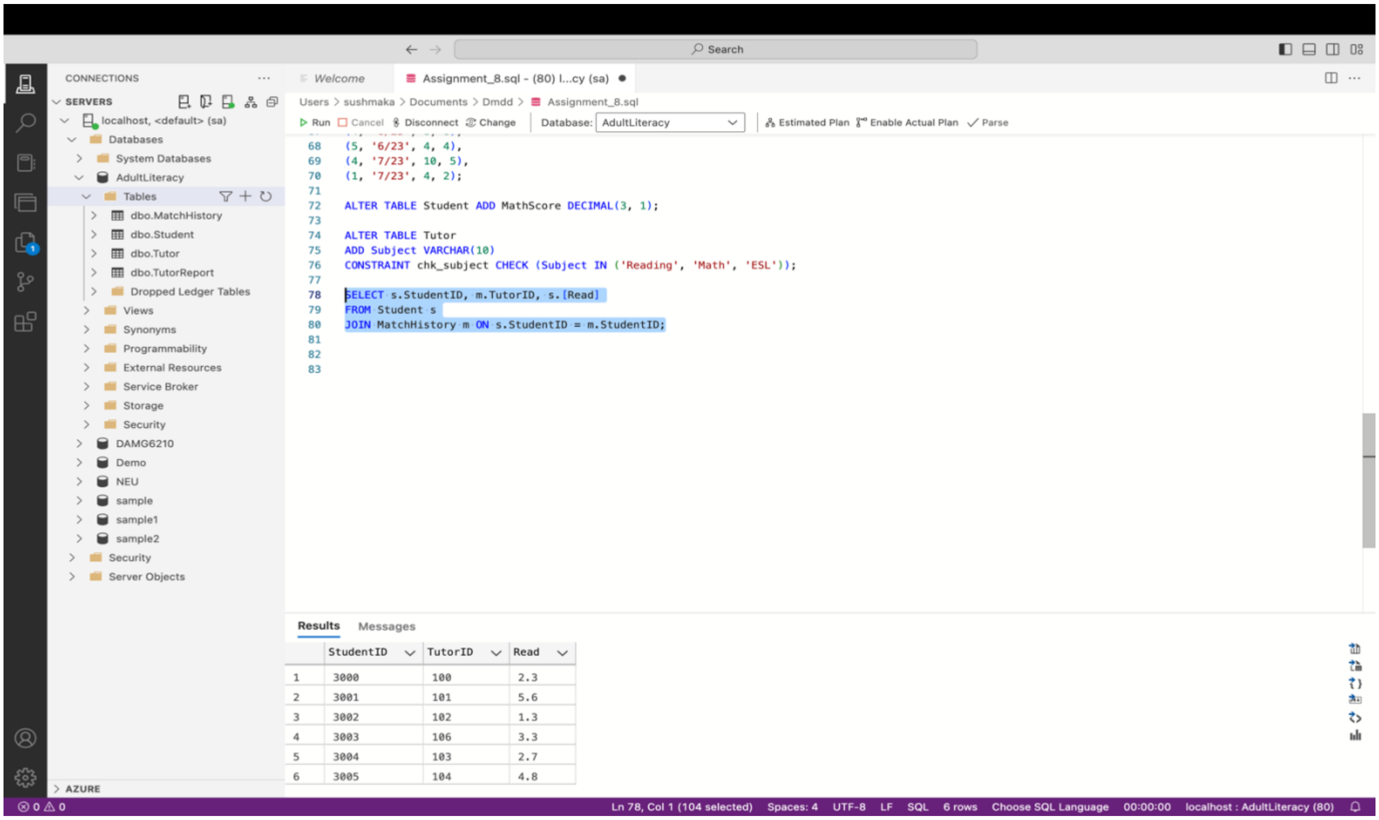


```
ALTER TABLE Tutor
ADD Subject VARCHAR(10)
CONSTRAINT chk_subject CHECK (Subject IN ('Reading', 'Math', 'ESL'));

INSERT INTO Tutor (TutorID, CertDate, Status, Subject) VALUES
(107, '2022-08-01', 'Active', 'Reading');

SELECT * FROM Tutor;

DELETE FROM Tutor WHERE TutorID = 107;
```

	TutorID	CertDate	Status	Subject
1	100	2022-01-05	Active	NULL
2	101	2022-01-05	Temp_Stop	NULL
3	102	2022-01-05	Dropped	NULL
4	103	2022-05-22	Active	NULL
5	104	2022-05-22	Active	NULL
6	105	2022-05-22	Temp_Stop	NULL
7	106	2022-05-22	Active	NULL
8	107	2022-08-01	Active	Reading

5.

```
SELECT s.StudentID, m.TutorID, s.[Read]
FROM Student s
JOIN MatchHistory m ON s.StudentID = m.StudentID;
```



Database: AdultLiteracy

```sql
(5, '6/23', 4, 4),
(4, '7/23', 10, 5),
(1, '7/23', 4, 2);

ALTER TABLE Student ADD MathScore DECIMAL(3, 1);

ALTER TABLE Tutor
ADD Subject VARCHAR(10)
CONSTRAINT chk_subject CHECK (Subject IN ('Reading', 'Math', 'ESL'));

SELECT s.StudentID, m.TutorID, s.[Read]
FROM Student s
JOIN MatchHistory m ON s.StudentID = m.StudentID;
```

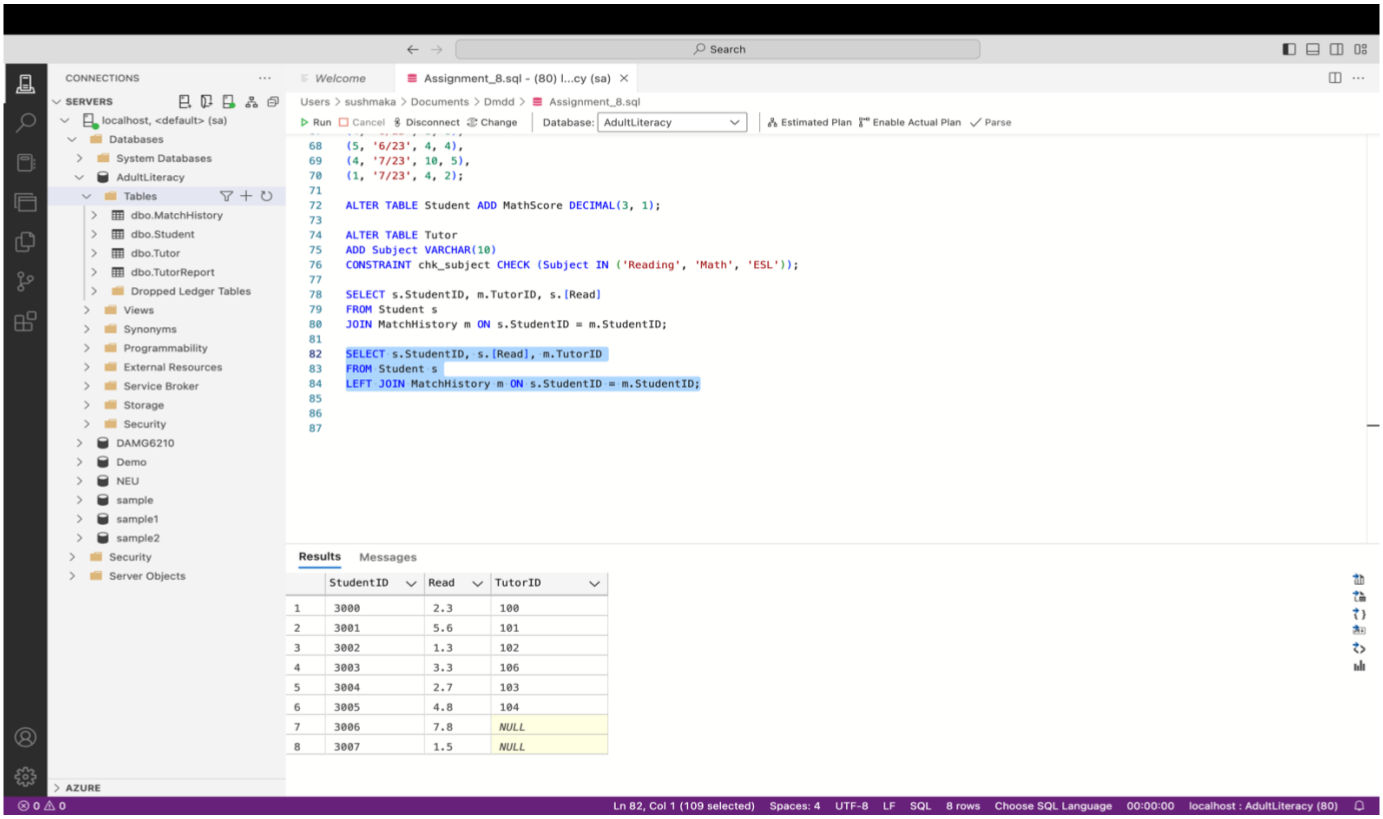
	StudentID	TutorID	Read
1	3000	100	2.3
2	3001	101	5.6
3	3002	102	1.3
4	3003	106	3.3
5	3004	103	2.7
6	3005	104	4.8

6.

SELECT s.StudentID, s.[Read], m.TutorID

FROM Student s

LEFT JOIN MatchHistory m ON s.StudentID = m.StudentID;



```sql
(5, '6/23', 4, 4),
(4, '7/23', 10, 5),
(1, '7/23', 4, 2);

ALTER TABLE Student ADD MathScore DECIMAL(3, 1);

ALTER TABLE Tutor
ADD Subject VARCHAR(10)
CONSTRAINT chk_subject CHECK (Subject IN ('Reading', 'Math', 'ESL'));

SELECT s.StudentID, m.TutorID, s.[Read]
FROM Student s
JOIN MatchHistory m ON s.StudentID = m.StudentID;

SELECT s.StudentID, s.[Read], m.TutorID
FROM Student s
LEFT JOIN MatchHistory m ON s.StudentID = m.StudentID;
```

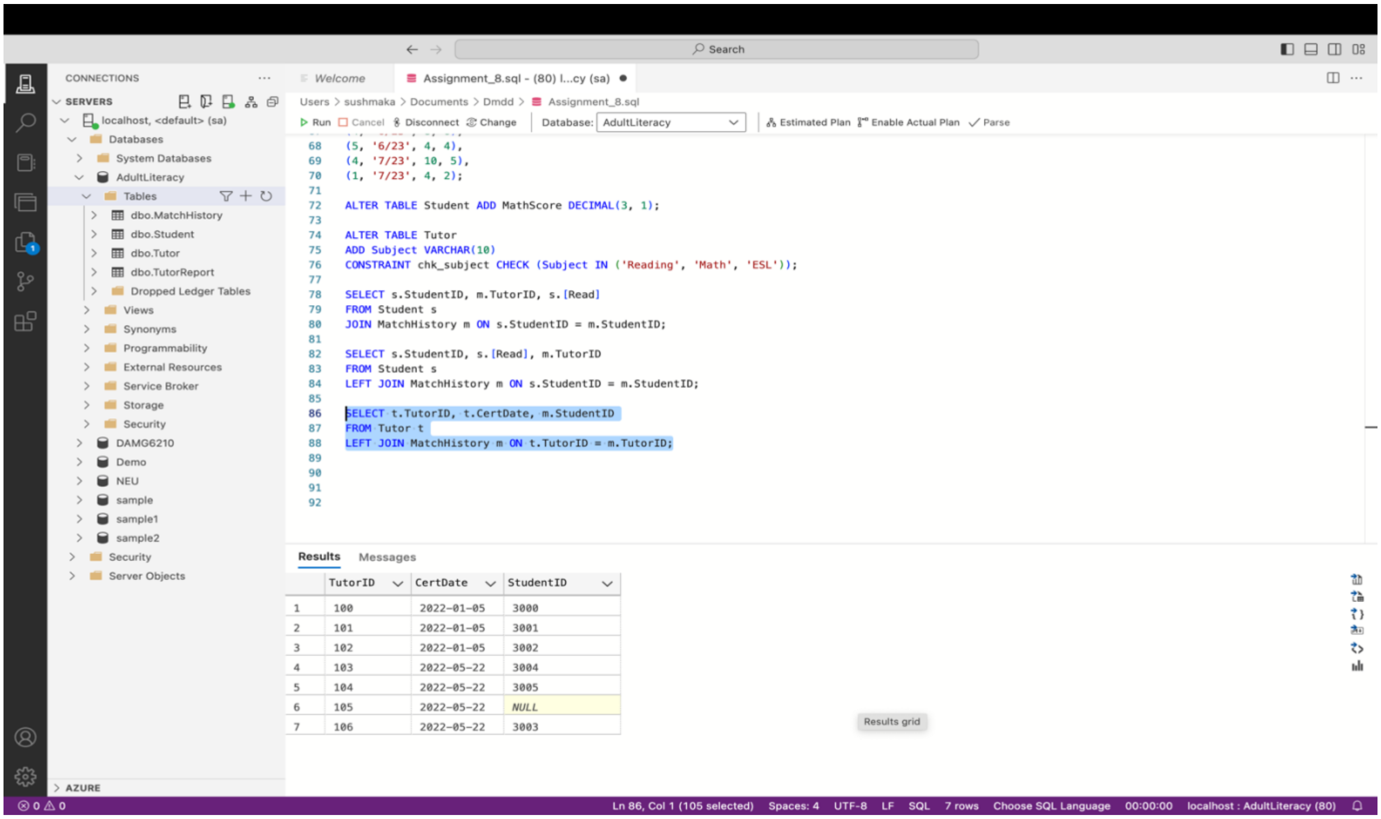
	StudentID	Read	TutorID
1	3000	2.3	100
2	3001	5.6	101
3	3002	1.3	102
4	3003	3.3	106
5	3004	2.7	103
6	3005	4.8	104
7	3006	7.8	NULL
8	3007	1.5	NULL

7.

SELECT t.TutorID, t.CertDate, m.StudentID

FROM Tutor t

LEFT JOIN MatchHistory m ON t.TutorID = m.TutorID;



```
(5, '6/23', 4, 4),
(4, '7/23', 10, 5),
(1, '7/23', 4, 2);

ALTER TABLE Student ADD MathScore DECIMAL(3, 1);

ALTER TABLE Tutor
ADD Subject VARCHAR(10)
CONSTRAINT chk_subject CHECK (Subject IN ('Reading', 'Math', 'ESL'));

SELECT s.StudentID, m.TutorID, s.[Read]
FROM Student s
JOIN MatchHistory m ON s.StudentID = m.StudentID;

SELECT s.StudentID, s.[Read], m.TutorID
FROM Student s
LEFT JOIN MatchHistory m ON s.StudentID = m.StudentID;

SELECT t.TutorID, t.CertDate, m.StudentID
FROM Tutor t
LEFT JOIN MatchHistory m ON t.TutorID = m.TutorID;
```

	TutorID	CertDate	StudentID
1	100	2022-01-05	3000
2	101	2022-01-05	3001
3	102	2022-01-05	3002
4	103	2022-05-22	3004
5	104	2022-05-22	3005
6	105	2022-05-22	NULL
7	106	2022-05-22	3003

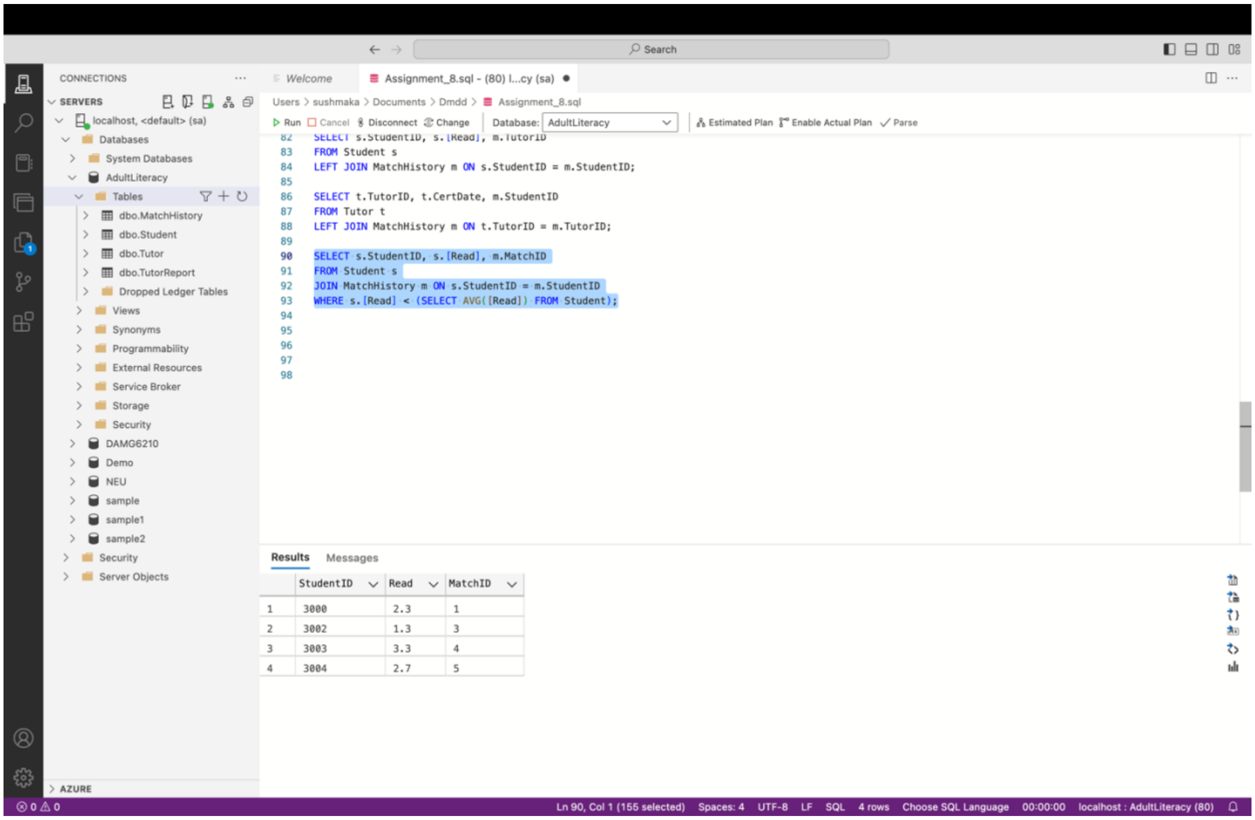
8.

SELECT s.StudentID, s.[Read], m.MatchID

FROM Student s

JOIN MatchHistory m ON s.StudentID = m.StudentID

WHERE s.[Read] < (SELECT AVG([Read]) FROM Student);



```
SELECT s.StudentID, s.[Read], m.TutorID
FROM Student s
LEFT JOIN MatchHistory m ON s.StudentID = m.StudentID;

SELECT t.TutorID, t.CertDate, m.StudentID
FROM Tutor t
LEFT JOIN MatchHistory m ON t.TutorID = m.TutorID;

SELECT s.StudentID, s.[Read], m.MatchID
FROM Student s
JOIN MatchHistory m ON s.StudentID = m.StudentID
WHERE s.[Read] < (SELECT AVG([Read]) FROM Student);
```

	StudentID	Read	MatchID
1	3000	2.3	1
2	3002	1.3	3
3	3003	3.3	4
4	3004	2.7	5

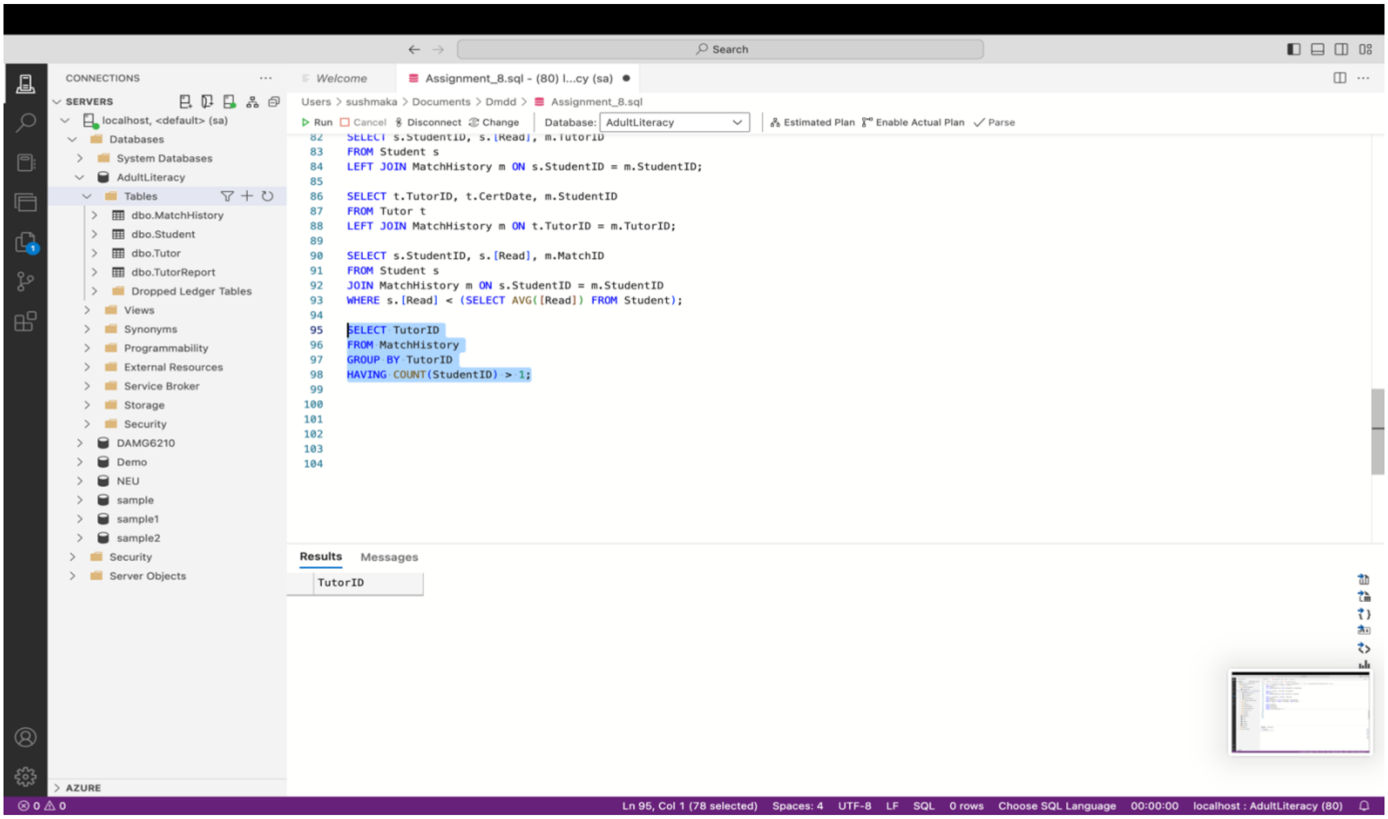
9.

SELECT TutorID

FROM MatchHistory

GROUP BY TutorID

HAVING COUNT(StudentID) > 1;

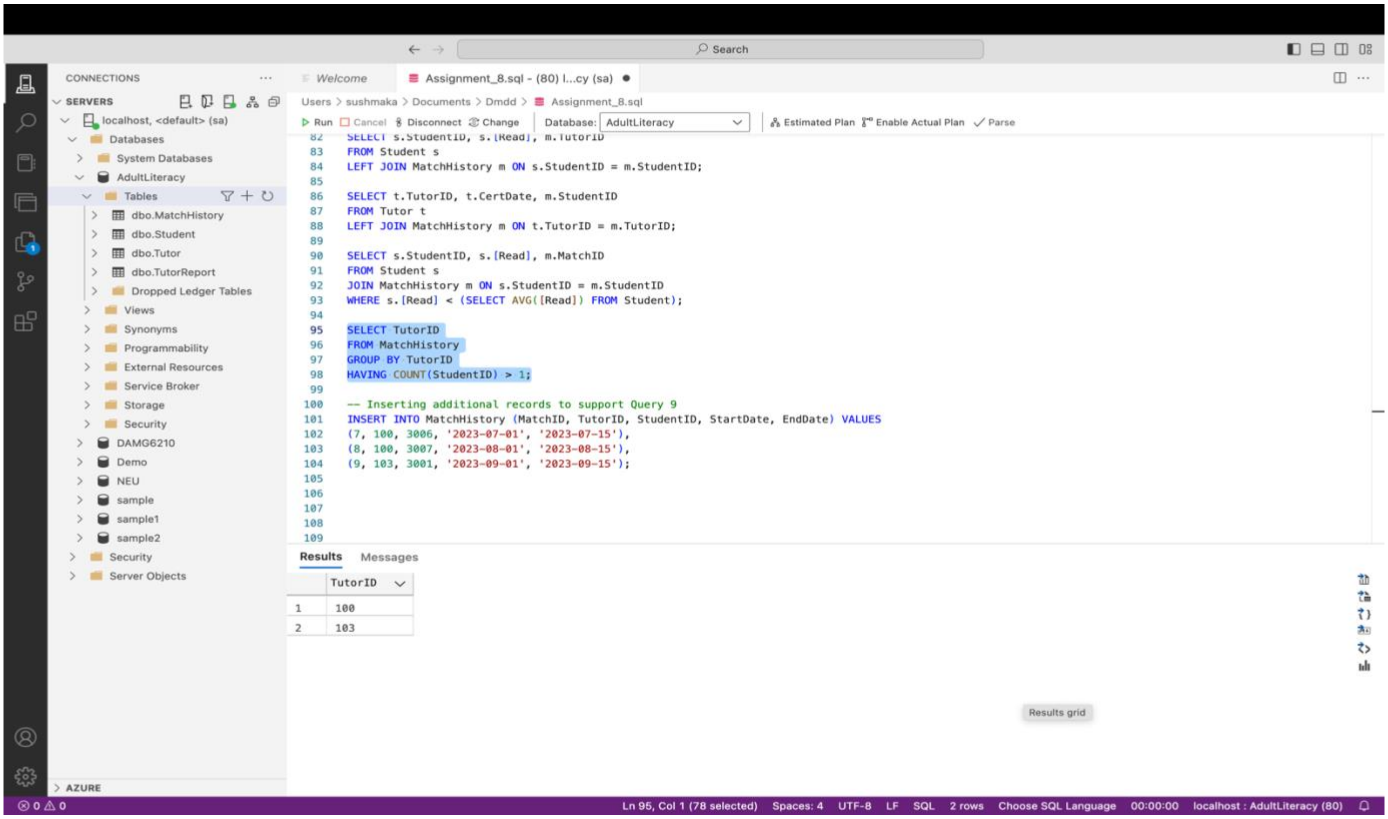


```sql
SELECT s.StudentID, s.[Read], m.TutorID
FROM Student s
LEFT JOIN MatchHistory m ON s.StudentID = m.StudentID;

SELECT t.TutorID, t.CertDate, m.StudentID
FROM Tutor t
LEFT JOIN MatchHistory m ON t.TutorID = m.TutorID;

SELECT s.StudentID, s.[Read], m.MatchID
FROM Student s
JOIN MatchHistory m ON s.StudentID = m.StudentID
WHERE s.[Read] < (SELECT AVG([Read]) FROM Student);

SELECT TutorID
FROM MatchHistory
GROUP BY TutorID
HAVING COUNT(StudentID) > 1;
```

Results

TutorID

Ln 95, Col 1 (78 selected) Spaces: 4 UTF-8 LF SQL 0 rows Choose SQL Language 00:00:00 localhost : AdultLiteracy (80)

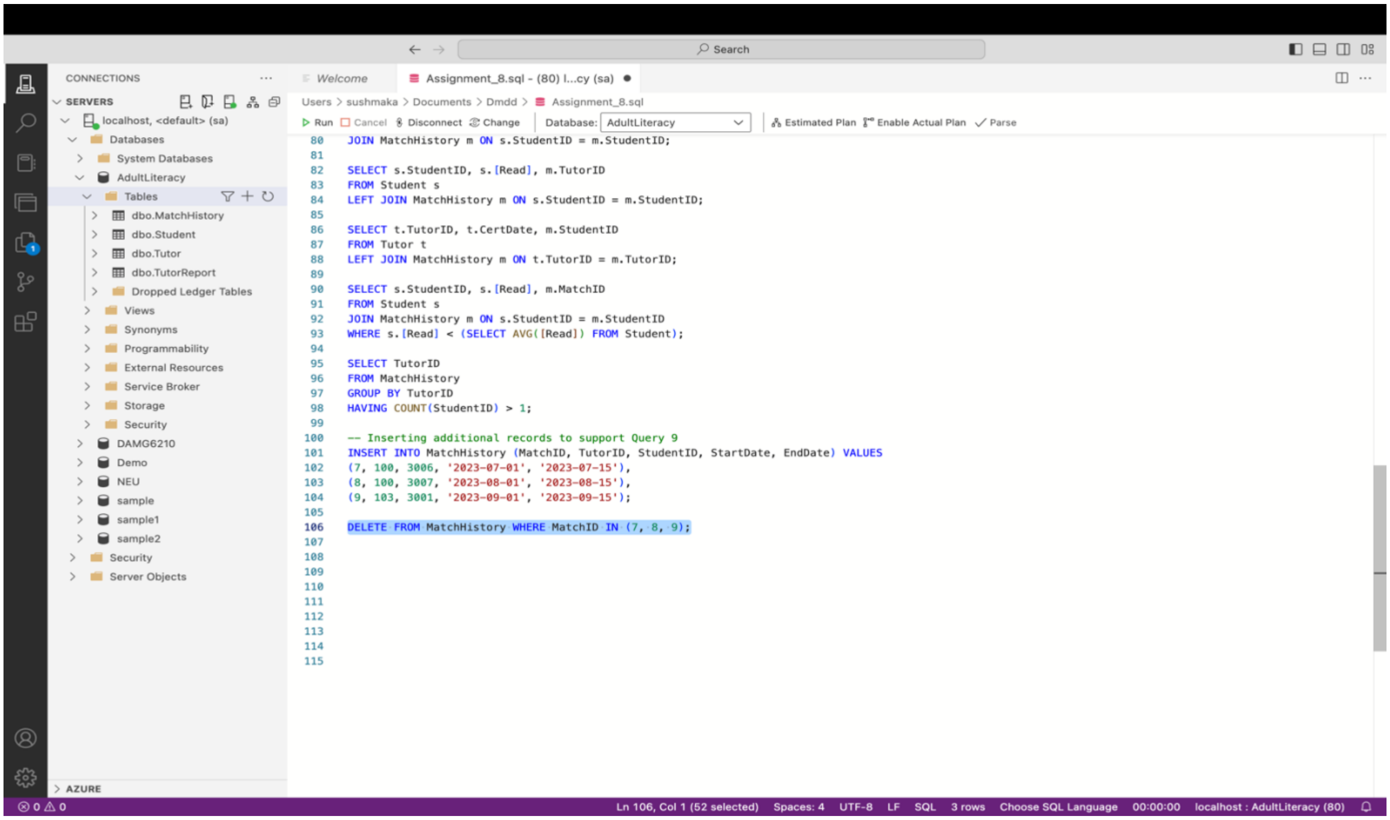


```sql
SELECT s.StudentID, s.[Read], m.TutorID
FROM Student s
LEFT JOIN MatchHistory m ON s.StudentID = m.StudentID;

SELECT t.TutorID, t.CertDate, m.StudentID
FROM Tutor t
LEFT JOIN MatchHistory m ON t.TutorID = m.TutorID;

SELECT s.StudentID, s.[Read], m.MatchID
FROM Student s
JOIN MatchHistory m ON s.StudentID = m.StudentID
WHERE s.[Read] < (SELECT AVG([Read]) FROM Student);

SELECT TutorID
FROM MatchHistory
GROUP BY TutorID
HAVING COUNT(StudentID) > 1;

-- Inserting additional records to support Query 9
INSERT INTO MatchHistory (MatchID, TutorID, StudentID, StartDate, EndDate) VALUES
(7, 100, 3006, '2023-07-01', '2023-07-15'),
(8, 100, 3007, '2023-08-01', '2023-08-15'),
(9, 103, 3001, '2023-09-01', '2023-09-15');
```

Results

	TutorID
1	100
2	103

Ln 95, Col 1 (78 selected) Spaces: 4 UTF-8 LF SQL 2 rows Choose SQL Language 00:00:00 localhost : AdultLiteracy (80)



```sql
JOIN MatchHistory m ON s.StudentID = m.StudentID;

SELECT s.StudentID, s.[Read], m.TutorID
FROM Student s
LEFT JOIN MatchHistory m ON s.StudentID = m.StudentID;

SELECT t.TutorID, t.CertDate, m.StudentID
FROM Tutor t
LEFT JOIN MatchHistory m ON t.TutorID = m.TutorID;

SELECT s.StudentID, s.[Read], m.MatchID
FROM Student s
JOIN MatchHistory m ON s.StudentID = m.StudentID
WHERE s.[Read] < (SELECT AVG([Read]) FROM Student);

SELECT TutorID
FROM MatchHistory
GROUP BY TutorID
HAVING COUNT(StudentID) > 1;

-- Inserting additional records to support Query 9
INSERT INTO MatchHistory (MatchID, TutorID, StudentID, StartDate, EndDate) VALUES
(7, 100, 3006, '2023-07-01', '2023-07-15'),
(8, 100, 3007, '2023-08-01', '2023-08-15'),
(9, 103, 3001, '2023-09-01', '2023-09-15');

DELETE FROM MatchHistory WHERE MatchID IN (7, 8, 9);
```

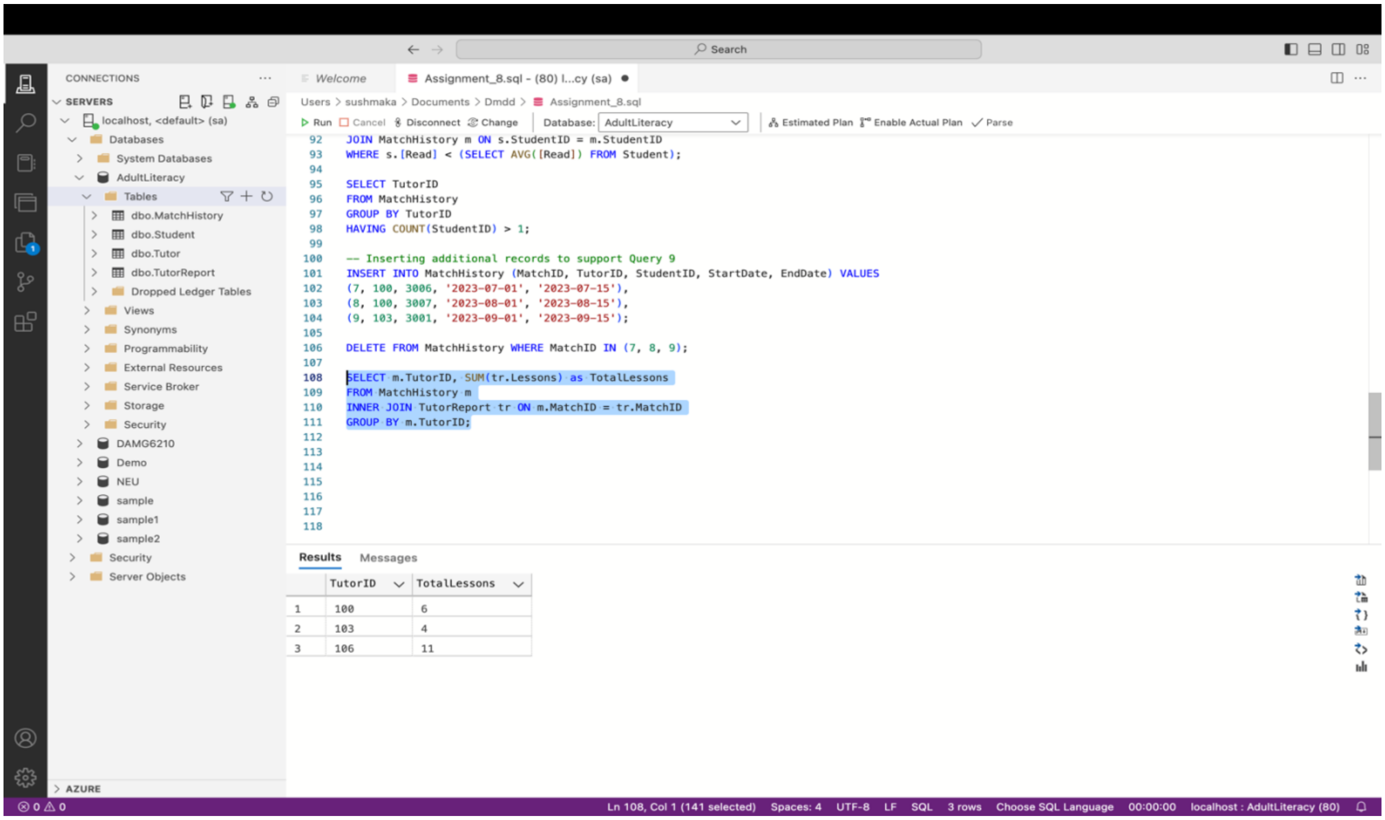
10.

SELECT m.TutorID, SUM(tr.Lessons) as TotalLessons

FROM MatchHistory m

INNER JOIN TutorReport tr ON m.MatchID = tr.MatchID

GROUP BY m.TutorID;

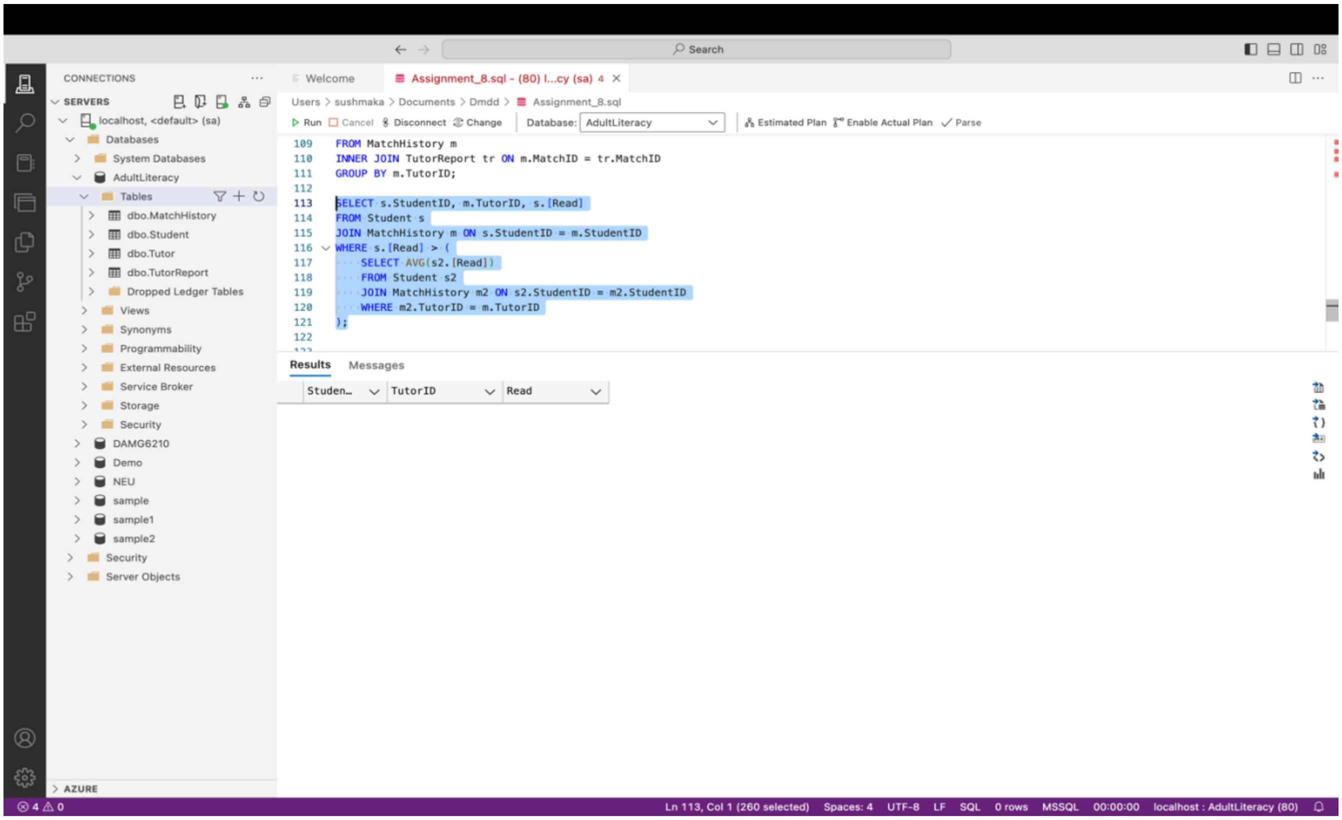


```sql
JOIN MatchHistory m ON s.StudentID = m.StudentID
WHERE s.[Read] < (SELECT AVG([Read]) FROM Student);

SELECT TutorID
FROM MatchHistory
GROUP BY TutorID
HAVING COUNT(StudentID) > 1;

-- Inserting additional records to support Query 9
INSERT INTO MatchHistory (MatchID, TutorID, StudentID, StartDate, EndDate) VALUES
(7, 100, 3006, '2023-07-01', '2023-07-15'),
(8, 100, 3007, '2023-08-01', '2023-08-15'),
(9, 103, 3001, '2023-09-01', '2023-09-15');

DELETE FROM MatchHistory WHERE MatchID IN (7, 8, 9);

SELECT m.TutorID, SUM(tr.Lessons) as TotalLessons
FROM MatchHistory m
INNER JOIN TutorReport tr ON m.MatchID = tr.MatchID
GROUP BY m.TutorID;
```

	TutorID	TotalLessons
1	100	6
2	103	4
3	106	11

11.

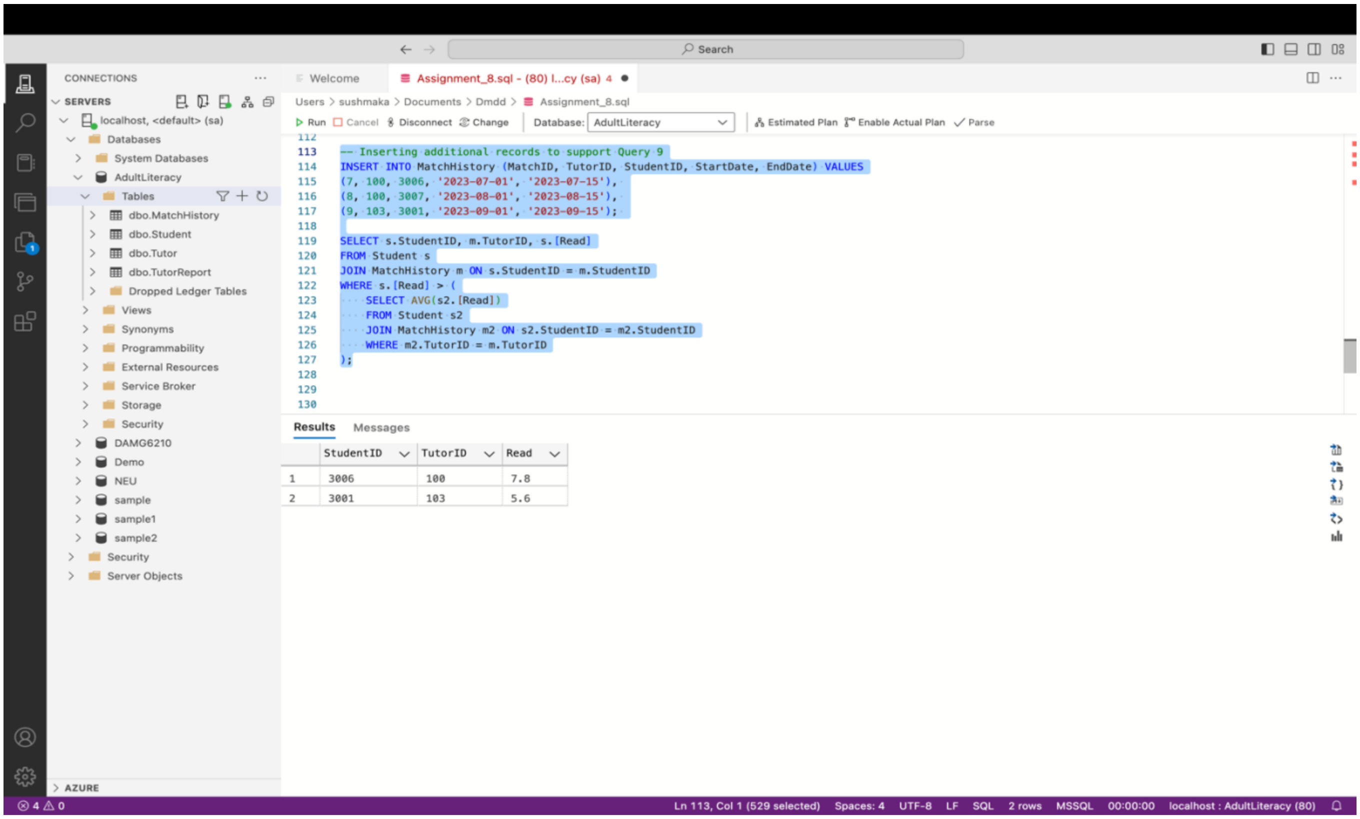
```sql
SELECT s.StudentID, m.TutorID, s.[Read]
FROM Student s
JOIN MatchHistory m ON s.StudentID = m.StudentID
WHERE s.[Read] > (
    SELECT AVG(s2.[Read])
    FROM Student s2
    JOIN MatchHistory m2 ON s2.StudentID = m2.StudentID
    WHERE m2.TutorID = m.TutorID
);
```


Assignment_8.sql - (80) l...cy (sa)
Users > sushmaka > Documents > Dmdd > Assignment_8.sql
Run
Cancel
Disconnect
Change
Database: AdultLiteracy
Estimated Plan
Enable Actual Plan
Parse
Ln 113, Col 1 (260 selected)
Spaces: 4
UTF-8
LF
SQL
0 rows
MSSQL
00:00:00
localhost : AdultLiteracy (80)

```sql
FROM MatchHistory m
INNER JOIN TutorReport tr ON m.MatchID = tr.MatchID
GROUP BY m.TutorID;

SELECT s.StudentID, m.TutorID, s.[Read]
FROM Student s
JOIN MatchHistory m ON s.StudentID = m.StudentID
WHERE s.[Read] > (
    SELECT AVG(s2.[Read])
    FROM Student s2
    JOIN MatchHistory m2 ON s2.StudentID = m2.StudentID
    WHERE m2.TutorID = m.TutorID
);
```

Results

```
Studen…   TutorID   Read
```


Assignment_8.sql - (80) l...cy (sa)
Users > sushmaka > Documents > Dmdd > Assignment_8.sql
Run
Cancel
Disconnect
Change
Database: AdultLiteracy
Estimated Plan
Enable Actual Plan
Parse
Ln 113, Col 1 (529 selected)
Spaces: 4
UTF-8
LF
SQL
2 rows
MSSQL
00:00:00
localhost : AdultLiteracy (80)

```sql
-- Inserting additional records to support Query 9
INSERT INTO MatchHistory (MatchID, TutorID, StudentID, StartDate, EndDate) VALUES
(7, 100, 3006, '2023-07-01', '2023-07-15'),
(8, 100, 3007, '2023-08-01', '2023-08-15'),
(9, 103, 3001, '2023-09-01', '2023-09-15');

SELECT s.StudentID, m.TutorID, s.[Read]
FROM Student s
JOIN MatchHistory m ON s.StudentID = m.StudentID
WHERE s.[Read] > (
    SELECT AVG(s2.[Read])
    FROM Student s2
    JOIN MatchHistory m2 ON s2.StudentID = m2.StudentID
    WHERE m2.TutorID = m.TutorID
);
```

Results

```
    StudentID   TutorID   Read
1   3006        100       7.8
2   3001        103       5.6
```

References

Hoffer, J. A., Ramesh, V., & Topi, H. (2016). *Modern database management* (13th ed.). Pearson