Student Performance Analysis

Exploring key factors impacting academic success through data-driven insights.

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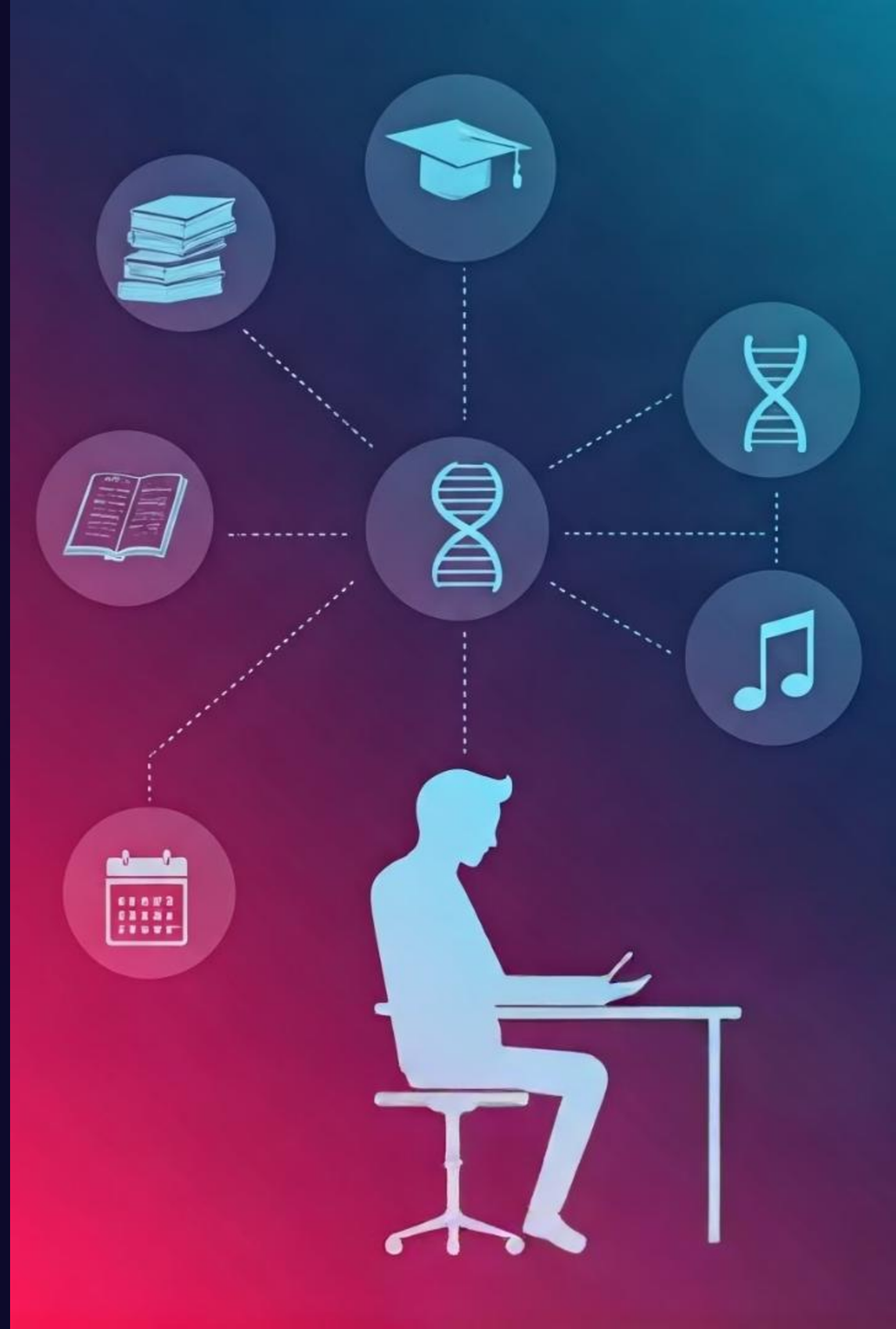


Analyzing Factors Affecting Student Academic Performance

This project looks at what affects students' exam performance by analyzing their daily habits and background. It focuses on things like study time, sleep, social media use, diet, and parents' education. The goal is to find useful patterns that can help students and teachers improve learning and results through smart, data-based decisions.

Advantages of This Student Performance Project

Data-Driven Decision Making

Helps students see how habits affect academic results for better self-improvement.

Personalized Study Strategies

Identifies ideal study times, sleep, and lifestyle for each student.

Help Schools Improve

Give useful info to schools to create better support for students.

Easy Visualization

Use clear visuals to make data easy for everyone to understand.

Motivations Behind the Analysis

Improve Student Performance

Share proven tips on studying, sleeping well, and eating right to boost school performance.

Encourage Healthy Habits

Teach about the harm of too much social media and not getting enough sleep.

Support Educators & Parents

Give useful and easy-to-understand advice to help students stay motivated and succeed.

```sql
CREATE TABLE student_performance (
    student_id VARCHAR(10) PRIMARY KEY,
    age INT,
    gender VARCHAR(10),
    study_hours_per_day NUMERIC(3,1),
    social_media_hours NUMERIC(3,1),
    netflix_hours NUMERIC(3,1),
    part_time_job VARCHAR(3),
    attendance_percentage NUMERIC(4,1),
    sleep_hours NUMERIC(3,1),
    diet_quality VARCHAR(5),
    exercise_frequency INT,
    parental_education_level VARCHAR(20),
    internet_quality VARCHAR(10),
    mental_health_rating INT,
    extracurricular_participation VARCHAR(3),
    exam_score NUMERIC(4,1)
);
```

The Tools We've Assembled

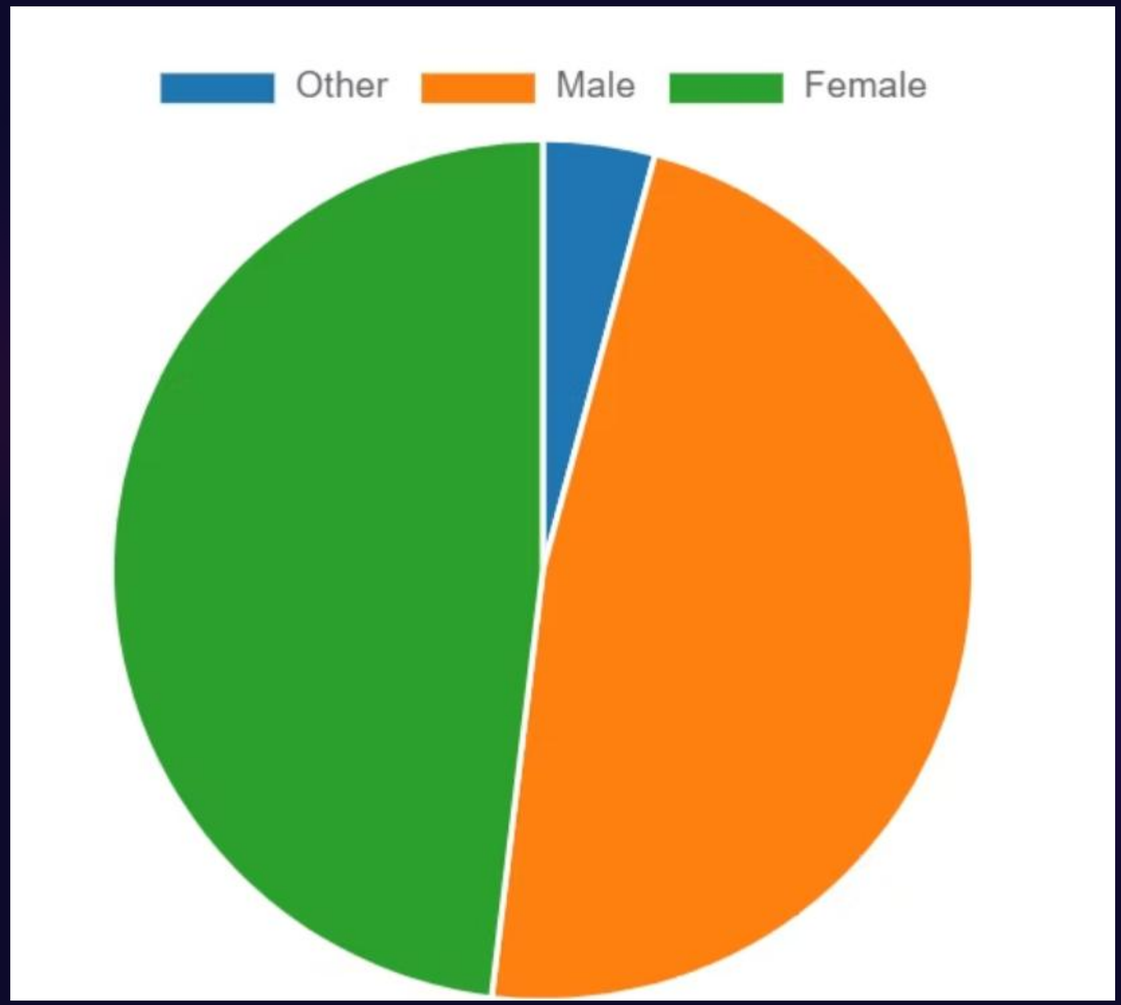
- CREATE TABLE - The foundation we built our analysis on.
- **Table Name** - student_performance, capturing the heart of our study.
- PRIMARY KEY - Anchoring our data on the **student_id**, the unique identifier.
- **Data Types**
  - VARCHAR(n) - For text fields like student_id, **gender**, and diet_quality.
  - INT - Wielding whole numbers for **age** and exercise_frequency.
  - NUMERIC(p,s) - Precise decimal values for study_hours_per_day.

How many students are there by gender?

```sql
-- Count of students by gender
SELECT gender, COUNT(*) as student_count
FROM student_performance
GROUP BY gender;
```

Data Output | Messages | Notifications

	gender character varying (10)	student_count bigint
1	Other	42
2	Male	477
3	Female	481



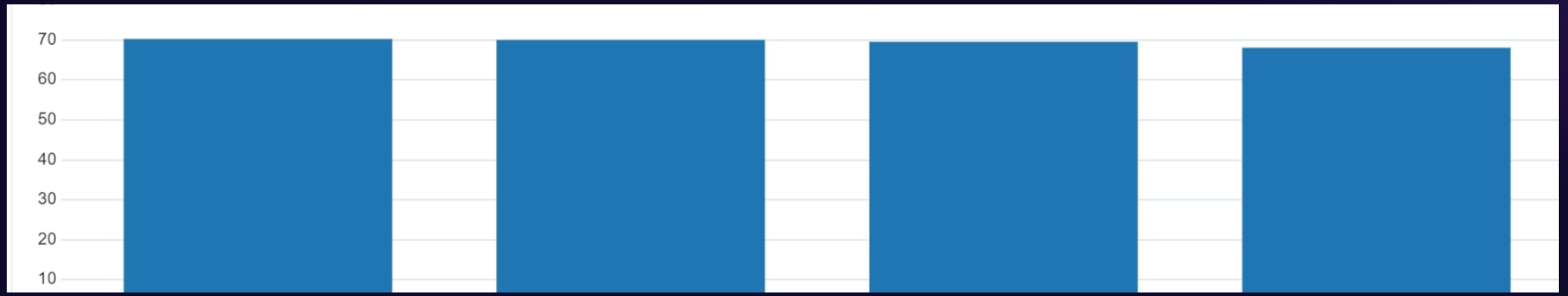
What is the average exam score for each level of parental education?

```sql
-- Average exam score by parental education level
SELECT parental_education_level, ROUND(AVG(exam_score), 2) as avg_score
FROM student_performance
GROUP BY parental_education_level
ORDER BY avg_score DESC;
```

Data Output | Messages | Graph Visualiser | Notifications

Showing rows: 1 to 4

	parental_education_level character varying (20)	avg_score numeric
1	Bachelor	70.27
2	None	70.03
3	High School	69.55
4	Master	68.09

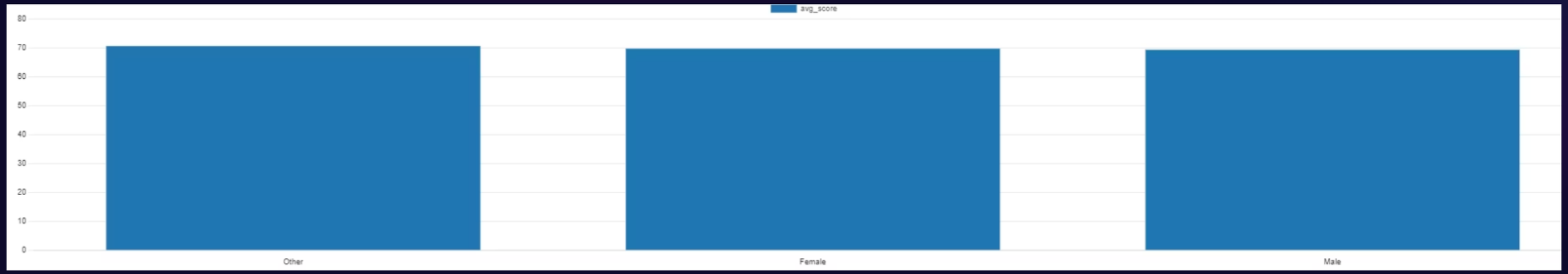


Which gender has the highest average exam score?

```sql
-- AVERAGE EXAM SCORE BY EACH GENDER
SELECT GENDER, ROUND(AVG(exam_score), 2) AS avg_score
FROM student_performance
GROUP BY GENDER
ORDER BY avg_score DESC;
```

Data Output | Messages | Notifications

	gender character varying (10)	avg_score numeric
1	Other	70.65
2	Female	69.74
3	Male	69.37

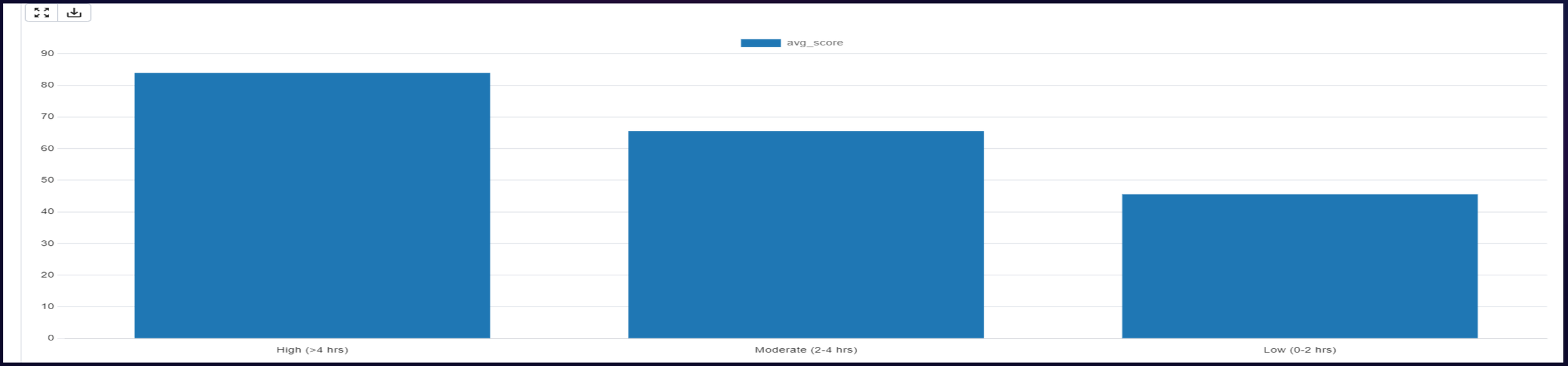


How do average exam scores differ based on how many hours students study each day?

```sql
-- Average exam score by study hours
SELECT
CASE
WHEN study_hours_per_day < 2 THEN 'Low (0-2 hrs)'
WHEN study_hours_per_day BETWEEN 2 AND 4 THEN 'Moderate (2-4 hrs)'
ELSE 'High (>4 hrs)'
END as study_category,
ROUND(AVG(exam_score), 2) as avg_score
FROM student_performance
GROUP BY study_category
ORDER BY avg_score DESC;
```

Data Output | Messages | Graph Visualiser | Notifications

	study_category text	avg_score numeric
1	High (>4 hrs)	83.95
2	Moderate (2-4 hrs)	65.54
3	Low (0-2 hrs)	45.56

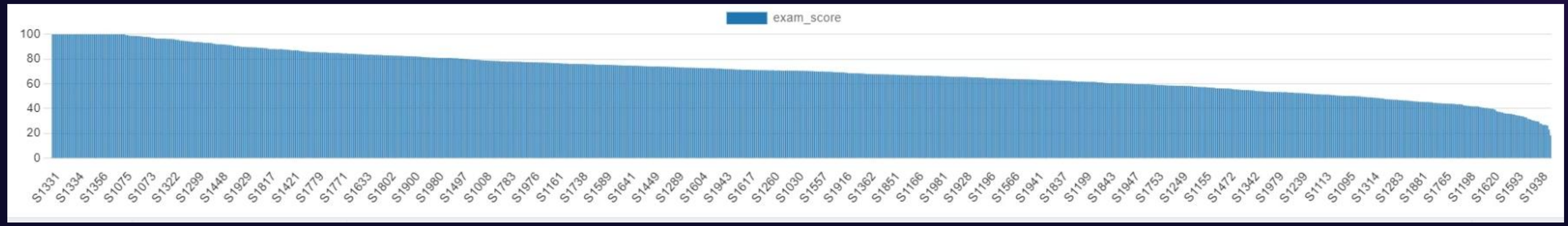


Who are the top-performing students based on their exam scores?

```sql
-- Top performing students
SELECT student_id, exam_score, study_hours_per_day, sleep_hours
FROM student_performance
ORDER BY exam_score DESC
```

Data Output | Messages | Graph Visualiser | Notifications

	student_id [PK] character varying (10)	exam_score numeric (4,1)	study_hours_per_day numeric (3,1)	sleep_hours numeric (3,1)
44	S1652	100.0	5.9	5.4
45	S1293	100.0	7.4	5.7
46	S1569	100.0	6.3	6.2
47	S1069	100.0	6.8	7.5
48	S1306	100.0	6.0	8.1
49	S1075	99.9	6.0	7.0
50	S1638	99.4	5.1	6.7

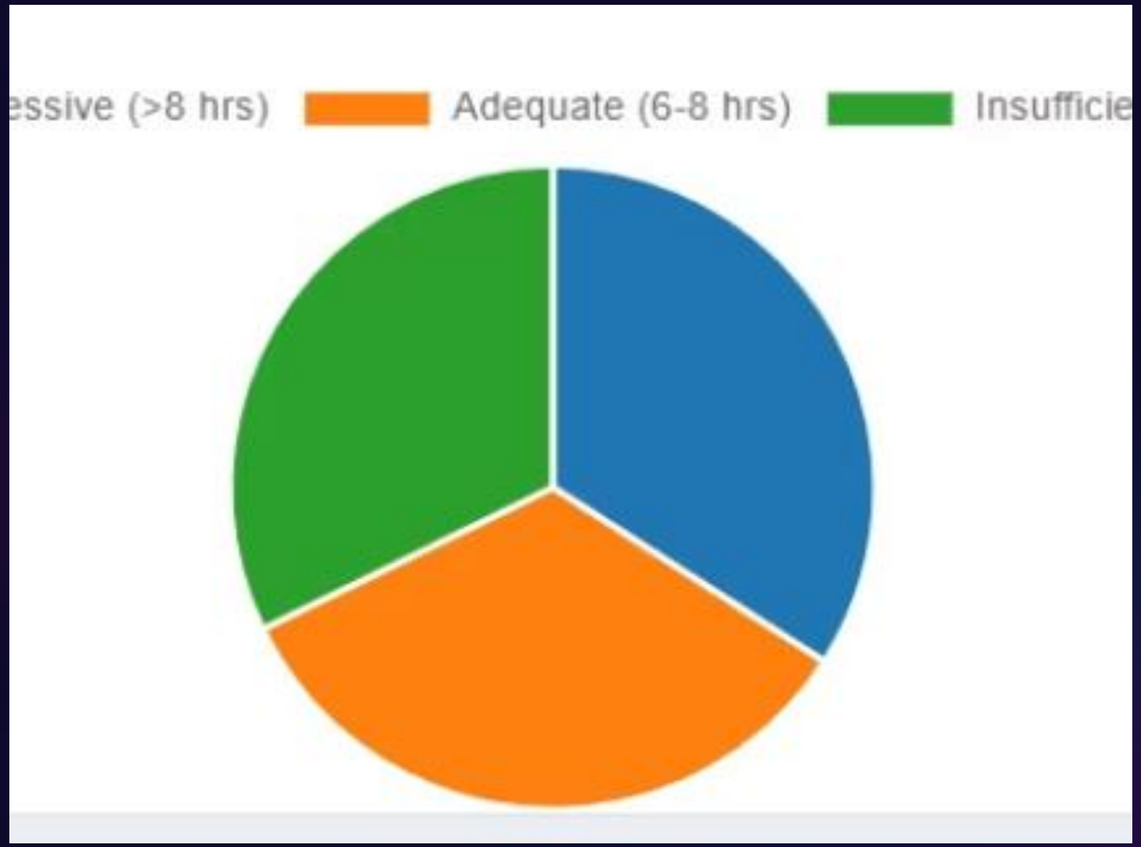


Does the number of hours a student sleeps affect their exam performance?

```sql
-- Does sleep affect performance?
SELECT
CASE
WHEN sleep_hours < 6 THEN 'Insufficient (<6 hrs)'
WHEN sleep_hours BETWEEN 6 AND 8 THEN 'Adequate (6-8 hrs)'
ELSE 'Excessive (>8 hrs)'
END as sleep_category,
ROUND(AVG(exam_score), 2) as avg_score
FROM student_performance
GROUP BY sleep_category
ORDER BY avg_score DESC;
```

Data Output | Messages | Graph Visualiser | Notifications

	sleep_category text	avg_score numeric
1	Excessive (>8 hrs)	71.43
2	Adequate (6-8 hrs)	70.53
3	Insufficient (<6 hrs)	67.55



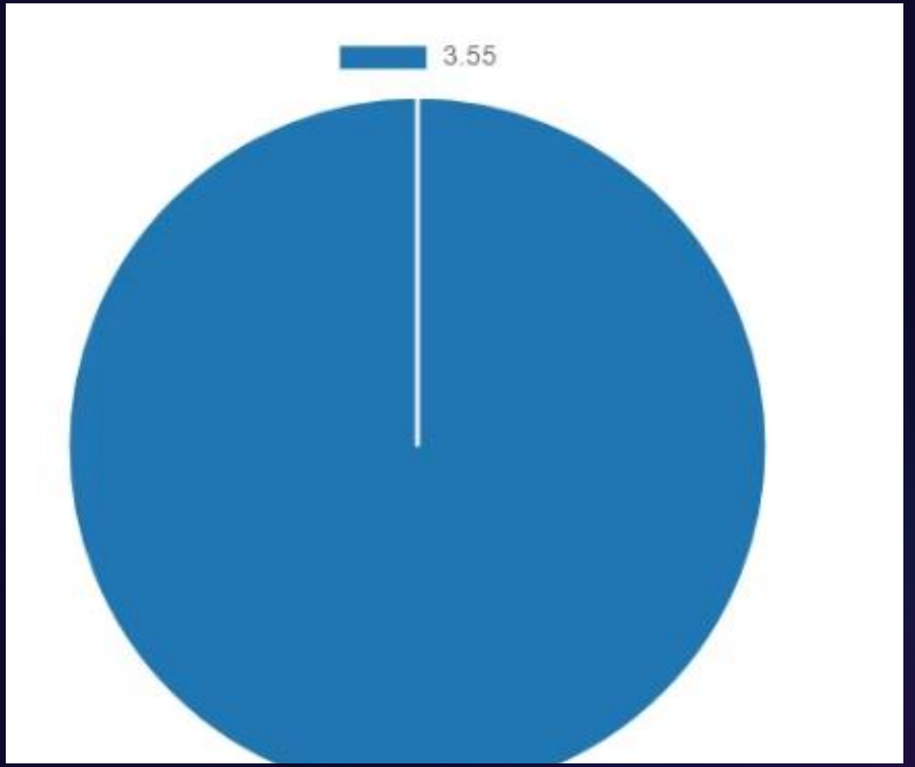
On average, how many hours do students spend studying versus using social media ?

```sql
-- Study hours vs. social media usage
SELECT
ROUND(AVG(study_hours_per_day),2) AS AVG_STUDY_HOURS,
ROUND(AVG(SOCIAL_MEDIA_HOURS),2) AS AVG_SOCIAL_MEDIA
FROM student_performance;
```

ta Output | Messages | Graph Visualiser | Notifications

SQL

avg_study_hours numeric	avg_social_media numeric
3.55	2.51

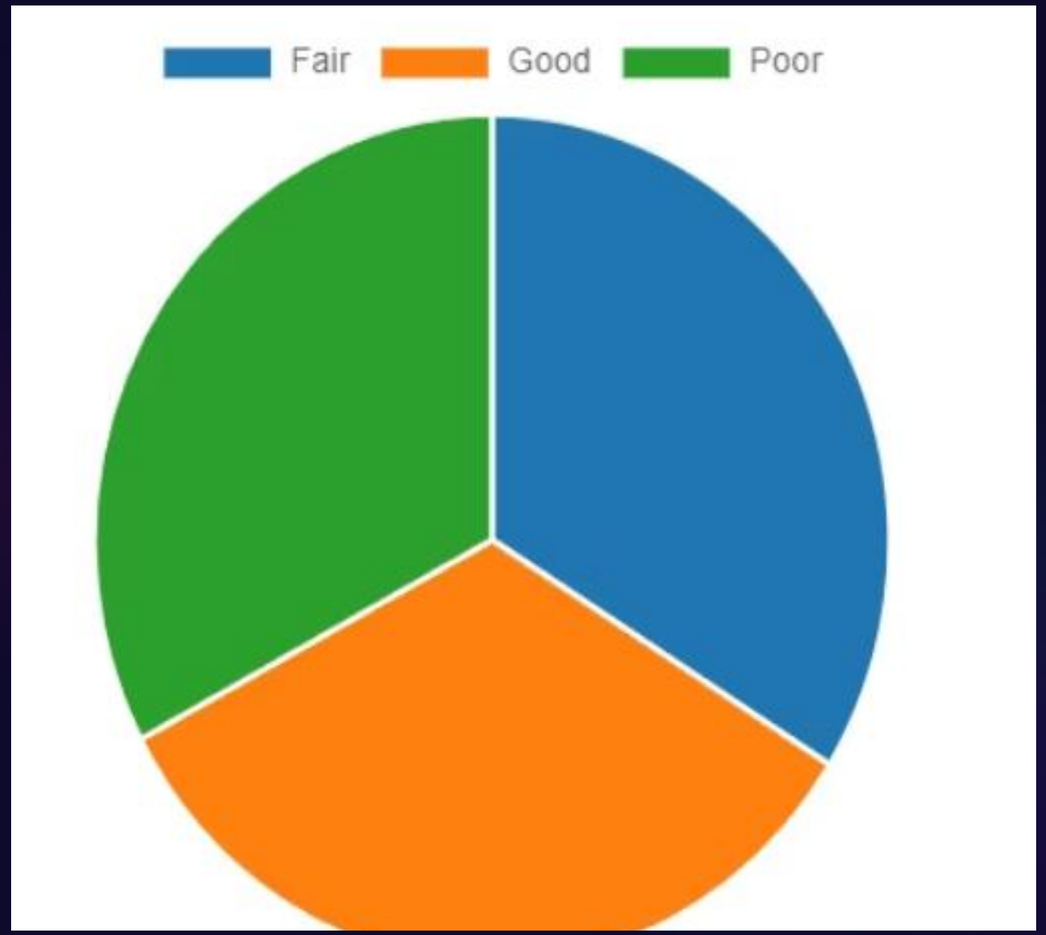


How does diet quality impact students' exam scores?

```sql
-- Diet quality and performance
SELECT diet_quality, ROUND(AVG(exam_score), 2) as avg_score
FROM student_performance
GROUP BY diet_quality
ORDER BY avg_score DESC;
```

Data Output | Messages | Graph Visualiser | Notifications

	diet_quality character varying (5)	avg_score numeric
1	Fair	70.43
2	Good	69.37
3	Poor	68.13

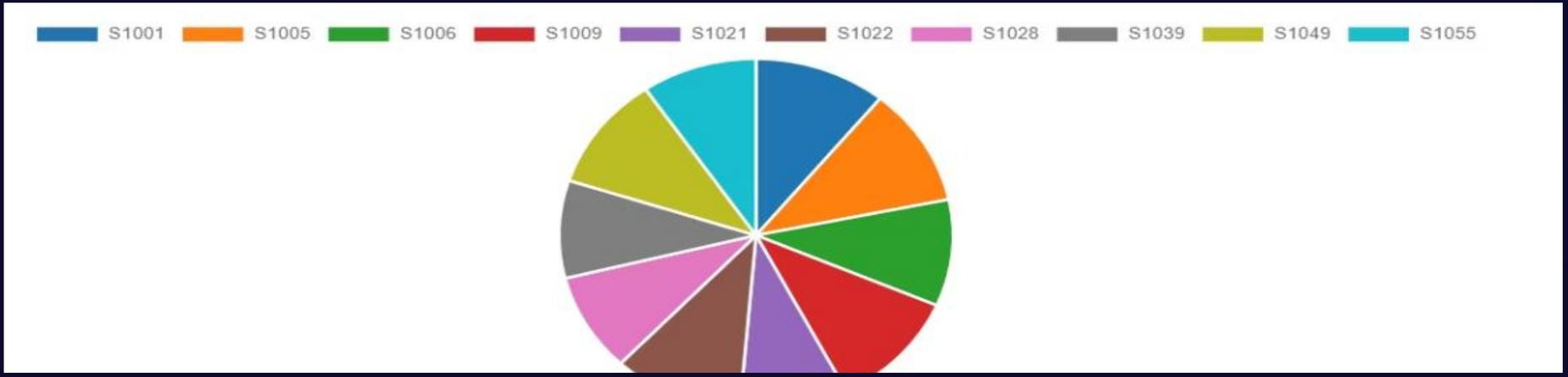


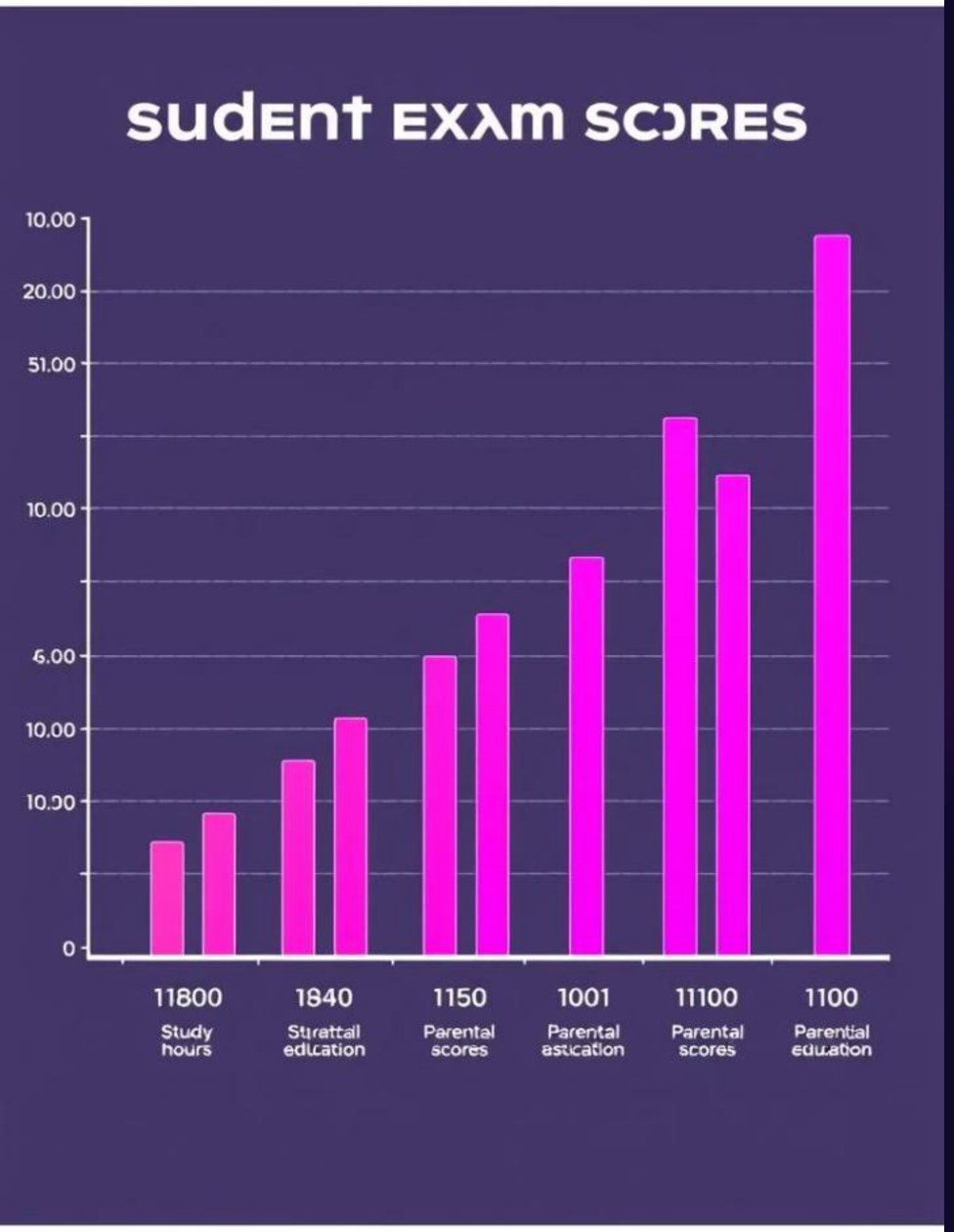
Which top 10 students study more than 4 hours daily and score above 80 in exams ?

```sql
-- Query to find TOP 10 students who study more than 4 hours daily and scored above 80
SELECT STUDENT_ID, STUDY_HOURS_PER_DAY, EXAM_SCORE
FROM student_performance
WHERE STUDY_HOURS_PER_DAY > 4 AND EXAM_SCORE > 80
LIMIT 10;
```

Data Output | Messages | Graph Visualiser | Notifications

	student_id [PK] character varying (10)	study_hours_per_day numeric (3,1)	exam_score numeric (4,1)
1	S1001	6.9	100.0
2	S1005	7.2	100.0
3	S1006	5.6	89.8
4	S1009	4.8	100.0
5	S1021	5.6	82.5
6	S1022	4.9	98.7
7	S1028	4.3	82.8
8	S1039	5.5	82.3
9	S1049	6.1	96.5
10	S1055	5.4	87.2





Key Findings from Data Analysis

Study Hours	2-4 hours daily linked to highest scores
Sleep Duration	6-8 hours yielded better concentration and outcomes
Diet Quality	Good diet associated with improved academic performance
Parental Education	Higher parental degrees correlated with elevated exam marks
Social Media Usage	Excessive use negatively impacted scores

Conclusions & Recommendations

For Students

- Keep study time consistent between 2 to 4 hours daily
- Prioritize 6 to 8 hours of quality sleep for optimal focus
- Limit social media and streaming distractions

For Educators & Parents

- Promote balanced routines integrating study, diet, and rest
- Encourage extracurricular activities to enhance well-being
- Improve internet access to support effective online learning