Data Insights with SQL

Problem 1: Calculate Average Deep Sleep Time for Both Genders

Objective: To find the average deep sleep time for both genders. The deep sleep time is derived by multiplying the deep_sleep_percentage with the sleep_duration (in hours). The result should be rounded to two decimal places.

Query:

```
SELECT gender,
    ROUND(AVG((deep_sleep_percentage / 100) * sleep_duration), 2) AS 'avg_deep_sleep_time'
FROM mydb.sleepy
GROUP BY gender;
```

- **Explanation**:
    - AVG((deep_sleep_percentage / 100) * sleep_duration) calculates the average deep sleep time for each gender.
    - The ROUND() function ensures the result is limited to two decimal places.
    - GROUP BY gender categorizes the results based on gender.

Problem 2: Average Sleep Duration for Top 15 Male Candidates

Objective: To find the average sleep duration for the top 15 male candidates whose sleep duration is greater than or equal to 7.5 hours.

Query:

```
SELECT id,
    ROUND(AVG(sleep_duration), 2) AS 'avg_sleep_time'
FROM mydb.sleepy
WHERE gender = 'Male'
GROUP BY id
HAVING avg_sleep_time >= 7.5
ORDER BY avg_sleep_time DESC
LIMIT 15;
```

- **Explanation**:
    - ROUND(AVG(sleep_duration), 2) calculates the average sleep duration for each male candidate and rounds it to two decimal places.
    - The HAVING clause filters out records where the average sleep time is less than 7.5 hours.
    - Results are ordered by the highest sleep duration (ORDER BY avg_sleep_time DESC) and limited to the top 15 candidates.

Problem 3: Light Sleep Percentage Between 10th to 30th Records

Objective: Find the records where the deep sleep percentage is between 25 and 45, and the light sleep percentage is between 10 and 30. Display only age, light sleep percentage, and deep sleep percentage. Select the 10th to 30th records based on light sleep percentage in ascending order.

Query:

```
SELECT id, age, light_sleep_percentage, deep_sleep_percentage
FROM mydb.sleepy
WHERE light_sleep_percentage BETWEEN 10 AND 30
  AND deep_sleep_percentage BETWEEN 25 AND 45
ORDER BY light_sleep_percentage ASC
LIMIT 20 OFFSET 9;
```

- **Explanation**:
    - light_sleep_percentage BETWEEN 10 AND 30 filters the records where the light sleep percentage falls within the specified range.
    - deep_sleep_percentage BETWEEN 25 AND 45 further narrows down records to a specific range of deep sleep percentage.
    - The ORDER BY clause sorts the data by light sleep percentage in ascending order.
    - LIMIT 20 OFFSET 9 selects records from the 10th to the 30th position.

Problem 4: Group by Exercise Frequency and Smoking Status

Objective: To find the average deep sleep, light sleep, and REM sleep times, grouped by exercise frequency and smoking status.

Query:

```
SELECT exercisefrequency, smoking_status,
```

```
    ROUND(AVG((deep_sleep_percentage / 100) * sleep_duration), 2) AS 'avg_deep',
    ROUND(AVG((light_sleep_percentage / 100) * sleep_duration), 2) AS 'avg_light',
    ROUND(AVG((rem_sleep_percentage / 100) * sleep_duration), 2) AS 'avg_rem'
FROM mydb.sleepy
GROUP BY exercisefrequency, smoking_status;
```

- **Explanation**:
    - This query calculates the average values for deep sleep, light sleep, and REM sleep times for each combination of exercisefrequency and smoking_status.
    - ROUND() ensures that the values are limited to two decimal places.
    - The GROUP BY clause groups data based on exercise frequency and smoking status.