Common Table Expressions (CTEs)

Common Table Expressions are useful when subqueries become resource intensive or hard to read and understand.

Here are the steps to create and use a CTE:

1. Declare a CTE using the **WITH** keyword.

2. Reference the CTE in your main query's FROM statement.

Our question: Let's say we want to see if countries with a lot of Nobel prize winners also tend to produce gold medalists in the Summer Olympic games.

1. Write a CTE to get the total Nobel prizes awarded to each country across all years in the dataset.

2. Write a query joining the summer games to the CTE to compare total Olympic gold medals to Nobel Prize wins. Include a join with the countries table to get the country name.

```sql
WITH nobel_winners as (SELECT country_id, sum(nobel_prize_winners) as total_nobels
                       FROM country_stats
                       WHERE nobel_prize_winners > 0
                       GROUP BY country_id
                       ORDER BY total_nobels DESC)

SELECT SUM(s.gold) as total_gold_medals, c.country, nw.total_nobels
FROM summer_games as s INNER JOIN nobel_winners as nw on s.country_id = nw.country_id
    INNER JOIN countries as c on s.country_id = c.id
WHERE s.gold IS NOT NULL
GROUP BY c.country, nw.total_nobels
ORDER BY total_gold_medals DESC;
```

	total_gold_medals double precision 🔒	country character varying (255) 🔒	total_nobels bigint 🔒
1	83	U.S.A. - United States	116
2	8	JPN - Japan	15
3	7	AUS - Australia	3
4	5	G.BR - Great Britain	16
5	3	ger - Germany	7
6	3	NED - Netherlands	1
7	3	CHN - China	2

Exercises

1. Write a CTE called ***top_gold_winter*** to find the top 5 gold-medal-winning countries for winter games in the database. Then write query to select the countries and the number of medals from the CTE where the total gold medals won is greater than or equal to 5.

2. Write a CTE called ***tall_athletes*** to find the athletes in the database who are taller than the average height for all athletes in the database. Next query that data to get just the female athletes who are taller than the average height for all athletes and are over the age of 30.

3. Write a CTE called ***tall_over30_female_athletes*** that returns the final results of exercise 2 above. Next query the CTE to find the average weight for the over 30 female athletes.