Integrated project: Maji Ndogo part 4 [MCQ] (Version : 0)

TEST

● Correct Answer

Answered in 1.2666666666667 Minutes

Question 1/10

How many UV filters do we have to install in total?

☐ 5,310

☑ 5,374

☐ 7,093

☐ 23,398

Explanation:

The correct answer is 5,374. The query to get this answer would involve counting the records where a UV filter is recommended, after correcting the data in Part 1.

```
SELECT COUNT(*)
FROM your_table
WHERE filter_type = 'UV';
```

The number 5,310 is incorrect because it is the result of the original data before correcting for the 64 wells incorrectly marked as "Clean" in Part 1 of the project.

The number 7,093 represents the number of "Install RO filter" values and is irrelevant to the question asking about UV filters.

The number 23,398 is incorrect because it implies that the COUNT() function was not used appropriately, possibly missing a GROUP BY clause.

Question 2/10

If you were to modify the query to include the percentage of people served by only dirty wells as a water source, which part of the town_aggregated_water_access CTE would you need to change?

□ Add a WHERE clause to the CTE with well_pollution.results != "Clean".

□ Add a WHERE clause to the CTE with combined_analysis_table.results = "Clean".

□ Add AND well_pollution.results != "Clean" to the well CASE statement.

☑ Add AND combined_analysis_table.results != "Clean" to the well CASE statement.

Explanation:

Add AND well_pollution.results != "Clean" to the well CASE statement is incorrect because the well_pollution table is not joined to the table we’re querying.

Add a WHERE clause to the CTE with well_pollution.results != "Clean" is incorrect because the wells_pollution table is not joined to the table we’re querying, and we cannot filter on results in this aggregated query.

Add a WHERE clause to the CTE with ct.results = "Clean" is incorrect because the condition is reversed, and we cannot filter on results in this aggregated query.

Question 3/10

Which province should we send drilling equipment to first?

□ Kilimani

☐ Hawassa

☑ Sokoto

☐ Amanzi

☐ Akatsi

Explanation:

21% of citizens in Sokoto use rivers. Drilling wells here will improve the most number of peoples lives.

Amanzi is incorrect because only 3% of the population uses rivers.

Kilimani is incorrect because only 8% of the population uses rivers.

Akatsi is incorrect because only 5% of the population uses rivers.

Hawassa is incorrect because only 4% of the population uses rivers.

Question 4/10

Why was the LEFT JOIN operation used with the well_pollution table in the queries?

☐ To prioritise records from well_pollution.

☐ To exclude any unmatched records from visits.

☐ To only include matched records from both tables.

☑ To include all records from visits and only matching well records from well_pollution.

Explanation:

The correct answer is "To include all records from visits and only matching well records from well_pollution." This is what a LEFT JOIN does by definition.

The statement "To exclude any unmatched records from visits" is incorrect because a LEFT JOIN actually includes all records from the left table (visits in this case), irrespective of whether they match with records in the right table.

The statement "To only include matched records from both tables" is incorrect because that's what an INNER JOIN does, not a LEFT JOIN.

The statement "To prioritise records from well_pollution" is incorrect because a LEFT JOIN prioritises records from the left table (visits), not the right one (well_pollution).

Question 5/10

Which towns should we upgrade shared taps first?

☑ Zuri, Abidjan, Bello

□ Majengo, Serowe, Yaounde

□ Ilanga, Bahari, Harare

□ Zanzibar, Isiqalo, Marang

Explanation:

Zuri, Abidjan, Bello - 71%, 53% and 53% of the population uses shared taps in each of these towns.

Zanzibar, Isiqalo, Marang - Only 19% - 22% of the population uses shared taps in each of these towns.

Majengo, Serowe, Yaounde - Only 14% of the population uses shared taps in each of these towns.

Ilanga, Bahari, Harare - Only 11% - 12% of the population uses shared taps in each of these towns.

Question 6/10

Which of the following improvements is suggested for a chemically contaminated well with a queue time of over 30 minutes?

□ Diagnose local infrastructure.

□ Drill X wells for each 30 minutes above 30 minutes.

□ Install UV filter.

☑ Install RO filter.

Explanation:

Drilling wells is for river sources, not for wells.

UV filters are for biological contamination, not chemical.

Diagnosing local infrastructure is for broken in-home taps, not chemical contamination.

Question 7/10

What is the maximum percentage of the population using rivers in a single town in the Amanzi province?

□ 21%

□ 6%

□ 22%

☑ 8%

Explanation:

The maximum percentage of the population using rivers in a single town in Amanzi is 8%.

Query:

```
SELECT MAX(river)
FROM town_aggregated_water_access
WHERE province_name = 'Amanzi';
```

21% - This is incorrect because this is the largest percentage of access for any town in our dataset (Bahari).

22% - This is incorrect because this is the largest percentage of access for any record in our dataset (Rural).

6% - This is the maximum for the province of Akatsi.

Question 8/10

In which province(s) do **all** towns have less than 50% access to home taps (including working and broken)?

☑ Hawassa.

□ Amanzi, Sokoto, and Akatsi.

□ No towns fulfil this requirement.

□ Kilimani, Hawassa, Sokoto, and Akatsi.

Explanation:

We will have to build the following query:

```
SELECT province_name
FROM town_aggregated_water_access
GROUP BY province_name
HAVING max(tap_in_home + tap_in_home_broken)
< 50;
```

"Amanzi, Sokoto, and Akatsi" is incorrect because > was used instead of <.

"Kilimani, Hawassa, Sokoto, and Akatsi" is incorrect because tap_in_home or tap_in_home_broken was used instead of the sum of them.

"No towns fulfil this requirement" is incorrect because the condition of the filter is reversed, i.e.

MIN() and > 50

Question 9/10

Suppose our finance minister would like to have data to calculate the total cost of the water infrastructure upgrades in Maji Ndogo. You are provided with a list that details both the types and the quantities of upgrades needed. Each type of upgrade has a specific unit cost in USD.

Example infrastructure_cost table:

Improvement	**Unit_cost_USD**
Drill well	8,500
Install UV and RO filter	4,200
Diagnose local infrastructure	350
...	…

Using this list, and the data in the md_water_services database, how would you calculate the total cost of all the infrastructure upgrades in Maji Ndogo?

☑ Query the project_progress database to find the quantities of each type of upgrade. Then, use a JOIN operation with the infrastructure_cost table to align the unit costs. Finally, multiply the unit cost for each type by its respective count and sum these totals for an overall estimated cost.

□ Query the project_progress table to find the average unit cost across all types of upgrades, and directly multiply this average by the total count of all types of upgrades.

□ Query the project_progress database to sum up the total count for each type of upgrade, and then multiply this sum by the unit cost of the most commonly occurring type of upgrade, without incorporating data from the infrastructure_cost database.

□ Use a JOIN operation to match the highest unit cost from the infrastructure_cost table with each type of upgrade in the

□ project_progress database. Then, multiply this highest unit cost by the total number of all types of upgrades.

□ Query the project_progress database to find the quantities of each type of upgrade and JOIN it with the infrastructure_cost table to align the unit costs. Apply a GROUP BY clause on the improvement type and then multiply the unit cost for each type by its respective count.

Explanation:

Query the project_progress database to find the average unit cost across all types of upgrades, and directly multiply this average by the total count of all types of upgrades … this approach is flawed because it only queries the project_progress database and takes an average of the unit costs across all types of improvements. This method ignores the specific unit costs provided in the infrastructure_cost database and thus could lead to an inaccurate total cost, either overestimating or underestimating the financial needs.

Use a JOIN operation to match the highest unit cost from the infrastructure_cost table … this is incorrect because, while this option does mention using a JOIN operation, it does so to match the highest unit cost with each type of upgrade. This would very likely result in an overestimation of the total cost. It fails to take into account the varied costs of different types of upgrades, applying the most expensive unit cost uniformly across all improvements.

Query the project_progress database to sum up the total count for each type of upgrade … this is incorrect because it fails to consider the infrastructure_cost database at all. By not incorporating unit cost data, the approach would lead to a flawed total cost estimate. It further errs by basing the cost calculation on the most commonly occurring type of upgrade, which may not at all be representative of the overall cost structure.

Query the project_progress database to find the quantities of each type of upgrade and JOIN it with the infrastructure_cost database to align the unit costs. Apply a GROUP BY … this is incorrect because, although it correctly mentions the JOIN operation and aligns the unit costs from the infrastructure_cost database, it misinterprets the question. The GROUP BY clause would provide a breakdown of the costs for each type of improvement, not a total cost for all improvements combined as the question asks.

Question 10/10

What does the following query describe?

```
SELECT
project_progress.Project_id,
project_progress.Town,
project_progress.Province,
project_progress.Source_type,
project_progress.Improvement,
Water_source.number_of_people_served,
RANK() OVER(PARTITION BY Province ORDER BY number_of_people_served)
FROM  project_progress
JOIN water_source
ON water_source.source_id = project_progress.source_id
WHERE Improvement = "Drill Well"
ORDER BY Province DESC, number_of_people_served
```

Hint: Run this query and inspect the results set.

☐ The query joins the project_progress and water_source tables. It then ranks the drilling projects in Maji Ndogo according to the number of people served by a source. Engineers can now prioritise where new wells should be drilled based on this ranking.

☑ The query joins the project_progress and water_source tables. It then ranks the projects where drilling a well was recommended within each province, by the number of people served by the water source. Using this table, engineers can be sent to the locations to drill wells where it is most needed.

☐ The query ranks all of the projects where drilling a well was recommended, based on the number of people they serve. It sorts them first by province and then by the number of people served. Engineers can now diagnose infrastructure problems effectively at each of these wells.

□ The query generates a list of all projects in the project_progress table and ranks them within each province, based on the number of people served. Engineers can now visit each water source where communities need it most.

Explanation:

The query generates a list of all projects in the project_progress table and ranks them within each province, based on the number of people served … this is incorrect because the query only focuses on "Drill Well" projects, not all projects. Additionally, the query is partitioned by province, which means the ranking is not overall but rather specific to each province. Thus, engineers cannot visit each water source where communities need it most based on this query alone.

The query joins the project_progress and water_source tables. It then ranks the drilling projects in Maji Ndogo according to the number of people served by a source … this is incorrect because the query does not include all types of projects from the project_progress table; it specifically filters for "Drill Well" projects. Therefore, it would not be accurate to say that well drills can be sent to the locations in most need of new wells based solely on this query.

The query ranks all of the projects where drilling a well was recommended, based on the number of people they serve. It sorts them first by province and then by the number of people served … this is incorrect because the query is specific to "Drill Well" projects and is partitioned by province. This data would not be suitable for diagnosing infrastructure problems as the query specifically filters for projects involving well drilling.