



University...a and Data

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What will be the output of this query: SELECT
COALESCE(SUM(c.credits * gp.points) /
NULLIF(SUM(c.credits), 0), 0) AS GPA FROM takes t,...



Analysis

The SQL query calculates the GPA for the student with `ID = '12345'`. Let's break down the query and the data to determine the output.

Query Breakdown:

SQL



```
SELECT
  COALESCE(
    SUM(c.credits * gp.points) / NULLIF(SUM(c.credits), 0),
    0
  ) AS GPA
FROM
  takes t,
  course c,
  grade_points gp
WHERE
  t.course_id = c.course_id AND t.grade = gp.grade AND t.ID = '12345';
```





- `FROM takes t, course c, grade_points gp` : This part joins the `takes`, `course`, and `grade_points` tables.
- `WHERE t.course_id = c.course_id AND t.grade = gp.grade AND t.ID = '12345'` : This specifies the join conditions and filters the data for the student with `ID = '12345'`.
- `SUM(c.credits * gp.points)` : This calculates the sum of (credits * points) for the selected student.
- `NULLIF(SUM(c.credits), 0)` : This prevents division by zero in case the student has no credits. If `SUM(c.credits)` is 0, it returns NULL.
- `SUM(c.credits * gp.points) / NULLIF(SUM(c.credits), 0)` : This calculates the GPA.
- `COALESCE(..., 0)` : If the result of the division is NULL (due to no credits), it returns 0; otherwise, it returns the calculated GPA.
- `AS GPA` : This assigns the alias "GPA" to the calculated value.

Data Relevant to the Query:



From the provided data, we need to look at the `takes`, `course`, and `grade_points` tables for student '12345'.

- **takes table (for ID = '12345'):**
 - ('12345', 'CS-101', '1', 'Fall', '2017', 'C')
 - ('12345', 'CS-190', '2', 'Spring', '2017', 'A')
 - ('12345', 'CS-315', '1', 'Spring', '2018', 'A')
 - ('12345', 'CS-347', '1', 'Fall', '2017', 'A')

• **course table:**

- 'CS-101', 'Intro. to Computer Science', 'Comp. Sci.', '4' 
- 'CS-190', 'Game Design', 'Comp. Sci.', '4' 
- 'CS-315', 'Robotics', 'Comp. Sci.', '3' 
- 'CS-347', 'Database System Concepts', 'Comp. Sci.', '3' 

• **grade_points table:**

- 'A', 4.00 
- 'C', 2.00 

Calculation:

1. **Join and Filter:** The query joins the three tables and filters for `ID = '12345'`. This gives us the following data:

t.ID	t.course_id	t.grade	c.credits	gp.points
'12345'	'CS-101'	'C'	4	2.00
'12345'	'CS-190'	'A'	4	4.00
'12345'	'CS-315'	'A'	3	4.00
'12345'	'CS-347'	'A'	3	4.00

2. **Calculate (credits * points) for each course:**

- CS-101: $4 * 2.00 = 8$
- CS-190: $4 * 4.00 = 16$
- CS-315: $3 * 4.00 = 12$
- CS-347: $3 * 4.00 = 12$

3. **Sum of (credits * points):** $8 + 16 + 12 + 12 = 48$

4. **Sum of credits:** $4 + 4 + 3 + 3 = 14$

5. **GPA Calculation:** $48 / 14 = 3.4285714285714286$

Output:

The query will return the calculated GPA.

3.4285714285714286

Sources and related content 

write a query to find the the ID and GPA of every student

Show code 



Analysis 

Here's the SQL query that retrieves the ID and GPA of every student, along with an explanation:



Student GPA Query
Apr 24, 2:02 PM

Open

Let me know if you have any other SQL query requests or if you'd like to explore other aspects of the database!

what will be the output of this query based on the schema in file

Show code <>



Analysis ▾

I'll walk through the execution of the query step by step using the data in the file to determine the output.

Here's the output of the query based on the provided schema and data:



Student GPA Query Output

Apr 24, 2:03 PM

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Hope this helps! Let me know if you have any other questions.

how did this result was received



Okay, let's break down how the GPA results in "student_gpa_query_output" were calculated. The query calculates the GPA for each student using data from the `takes`, `course`, and `grade_points` tables. Here's a step-by-step explanation:

1. Data Retrieval and Joining

- The query starts by joining the `takes`, `course`, and `grade_points` tables.
- The `takes` table contains the grades a student got for each course.
- The `course` table contains the number of credits for each course.
- The `grade_points` table contains the point value for each grade (e.g., 'A' = 4.00).
- The tables are joined using the `course_id` and `grade` columns to link the relevant information.

2. GPA Calculation

For each student, the GPA is calculated as follows:

- For every course the student took, the query multiplies the number of credits for that course by the point value of the grade the student received.
- These values are summed up for all courses taken by that student.
- The total is then divided by the total number of credits the student has taken.

3. Handling edge cases

- If a student has not taken any courses, the query uses the `COALESCE` and `NULLIF` functions to avoid division by zero and returns a GPA of 0.

4. Grouping and Ordering

- The `GROUP BY t.ID` clause ensures that the GPA is calculated separately for each student.
- The `ORDER BY t.ID` clause sorts the results by student ID.

Example Student ID: 1001001

Example: Student '00128'

- Student '00128' has taken 'CS-101' with grade 'A' and 'CS-347' with grade 'A-'.
- 'CS-101' has 4 credits, and 'A' is worth 4.00 points.
- 'CS-347' has 3 credits, and 'A-' is worth 3.70 points.
- Total credits * points = $(4 * 4.00) + (3 * 3.70) = 16 + 11.1 = 27.1$
- Total credits = $4 + 3 = 7$
- GPA = $27.1 / 7 = 3.871429$

The query performs this calculation for every student in the database and returns their ID and calculated GPA.



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