29_Compressed Mean Easy - Solution

Source - https://datalemur.com/questions/alibaba-compressed-mean

Running Notes

- find the mean number of items per order on Alibaba
- rounded to 1 decimal place
- we need to calculate the arithmetic average
- so, this won't work

```
SELECT ROUND(AVG(order_occurrences),1) AS mean
FROM items_per_order;
```

- because,
- This is how the airthmetic average is calculated

Let's calculate the arithmetic average:

Total items = `(1*500) + (2*1000) + (3*800) + (4*1000) = 8900`

Total orders = `500 + 1000 + 800 + 1000 = 3300`

Mean = `8900 / 3300 = 2.7`

```
SELECT ROUND(SUM(item_count*order_occurrences)/SUM(order_occurre
FROM items_per_order;
```

So this gave an error

```
function round(double precision, integer) does not exist (LIN
E: 1)
```

Why this error?

The `ROUND()` function in PostgreSQL expects its first argument to be of type **numeric**, not `double precision`. While both `numeric` and `double precision` can represent decimal numbers, PostgreSQL treats them differently:

1. **`double precision`**: A floating-point type that is faster but can lose precision for very large or very small numbers.
2. **`numeric`**: A fixed-precision type designed for exact arithmetic.

The `ROUND()` function is specifically designed for the **`numeric` type**, not for `double precision`. Without an explicit cast, PostgreSQL cannot automatically convert a `double precision` result into `numeric` when passed to the `ROUND()` function, hence the error.

In PostgreSQL, dividing two integers results in a `DOUBLE PRECISION` value if there is a fractional part.

Even though the original columns are `INTEGER`, the division `SUM(item_count * order_occurrences) / SUM(order_occurrences)` likely returns a `DOUBLE PRECISION` due to PostgreSQL's handling of division in aggregate functions. The `ROUND()` function with two arguments (`ROUND(value, precision)`) only supports the `NUMERIC` type, not `DOUBLE PRECISION`.

So after fixing it

```
SELECT ROUND((SUM(item_count*order_occurrences)/SUM(order_occur
AS mean
FROM items_per_order;
```

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