Revising Aggregations - The Count Function

Query a *count* of the number of cities in **CITY** having a *Population* larger than $100,000$.

Input Format

The **CITY** table is described as follows:

CITY

Field	Type
ID	NUMBER
NAME	VARCHAR2(17)
COUNTRYCODE	VARCHAR2(3)
DISTRICT	VARCHAR2(20)
POPULATION	NUMBER

Revising Aggregations - The Sum Function

Query the total population of all cities in **CITY** where *District* is **California**.

Input Format

The **CITY** table is described as follows:

CITY

Field	Type
ID	NUMBER
NAME	VARCHAR2(17)
COUNTRYCODE	VARCHAR2(3)
DISTRICT	VARCHAR2(20)
POPULATION	NUMBER

Revising Aggregations - Averages

Query the average population of all cities in **CITY** where *District* is **California**.

Input Format

The **CITY** table is described as follows:

CITY

Field	Type
ID	NUMBER
NAME	VARCHAR2(17)
COUNTRYCODE	VARCHAR2(3)
DISTRICT	VARCHAR2(20)
POPULATION	NUMBER

Average Population

Query the average population for all cities in **CITY**, rounded *down* to the nearest integer.

Input Format

The **CITY** table is described as follows:

CITY

Field	Type
ID	NUMBER
NAME	VARCHAR2(17)
COUNTRYCODE	VARCHAR2(3)
DISTRICT	VARCHAR2(20)
POPULATION	NUMBER

Japan Population

Query the sum of the populations for all Japanese cities in **CITY**. The *COUNTRYCODE* for Japan is **JPN**.

Input Format

The **CITY** table is described as follows:

CITY

Field	Type
ID	NUMBER
NAME	VARCHAR2(17)
COUNTRYCODE	VARCHAR2(3)
DISTRICT	VARCHAR2(20)
POPULATION	NUMBER

Population Density Difference

Query the difference between the maximum and minimum populations in **CITY**.

Input Format

The **CITY** table is described as follows:

CITY

Field	Type
ID	NUMBER
NAME	VARCHAR2(17)
COUNTRYCODE	VARCHAR2(3)
DISTRICT	VARCHAR2(20)
POPULATION	NUMBER

The Blunder

Samantha was tasked with calculating the average monthly salaries for all employees in the **EMPLOYEES** table, but did not realize her keyboard's 0 key was broken until after completing the calculation. She wants your help finding the difference between her miscalculation (using salaries with any zeroes removed), and the actual average salary.

Write a query calculating the amount of error (i.e.: $actual - miscalculated$ average monthly salaries), and round it up to the next integer.

Input Format

The **EMPLOYEES** table is described as follows:

Column	*Type*
ID	*Integer*
Name	*String*
Salary	*Integer*

Note: *Salary* is measured in dollars per month and its value is $< 10^5$.

Sample Input

ID	*Name*	*Salary*
1	*Kristeen*	*1420*
2	*Ashley*	*2006*
3	*Julia*	*2210*
4	*Maria*	*3000*

Sample Output

```
2061
```

Explanation

The table below shows the salaries *without zeroes* as they were entered by Samantha:

ID	*Name*	*Salary*
1	*Kristeen*	*142*
2	*Ashley*	*26*
3	*Julia*	*221*
4	*Maria*	*3*

Samantha computes an average salary of 98.00. The *actual* average salary is 2159.00.

The resulting error between the two calculations is $2159.00 - 98.00 = 2061.00$ which, when rounded to the next integer, is 2061.

Top Earners

We define an employee's *total earnings* to be their monthly $salary \times months$ worked, and the *maximum total earnings* to be the maximum total earnings for any employee in the **Employee** table. Write a query to find the *maximum total earnings* for all employees as well as the total number of employees who have maximum total earnings. Then print these values as 2 space-separated integers.

Input Format

The **Employee** table containing employee data for a company is described as follows:

Column	Type
employee_id	Integer
name	String
months	Integer
salary	Integer

where *employee_id* is an employee's ID number, *name* is their name, *months* is the total number of months they've been working for the company, and *salary* is the their monthly salary.

Sample Input

employee_id	name	months	salary
12228	Rose	15	1968
33645	Angela	1	3443
45692	Frank	17	1608
56118	Patrick	7	1345
59725	Lisa	11	2330
74197	Kimberly	16	4372
78454	Bonnie	8	1771
83565	Michael	6	2017
98607	Todd	5	3396
99989	Joe	9	3573

Sample Output

```
69952 1
```

Explanation

The table and earnings data is depicted in the following diagram:

employee_id	name	months	salary	earnings
12228	Rose	15	1968	29520
33645	Angela	1	3443	3443
45692	Frank	17	1608	27336
56118	Patrick	7	1345	9415
59725	Lisa	11	2330	25630
74197	Kimberly	16	4372	69952
78454	Bonnie	8	1771	14168
83565	Michael	6	2017	12102
98607	Todd	5	3396	16980
99989	Joe	9	3573	32157

The maximum *earnings* value is 69952. The only employee with *earnings* $= 69952$ is *Kimberly*, so we print the maximum *earnings* value (69952) and a count of the number of employees who have earned $\$69952$ (which is 1) as two space-separated values.

Weather Observation Station 2

Query the following two values from the **STATION** table:

1. The sum of all values in *LAT_N* rounded to a scale of 2 decimal places.
2. The sum of all values in *LONG_W* rounded to a scale of 2 decimal places.

Input Format

The **STATION** table is described as follows:

STATION

Field	Type
ID	NUMBER
CITY	VARCHAR2(21)
STATE	VARCHAR2(2)
LAT_N	NUMBER
LONG_W	NUMBER

where *LAT_N* is the northern latitude and *LONG_W* is the western longitude.

Output Format

Your results must be in the form:

```
lat lon
```

where lat is the sum of all values in *LAT_N* and lon is the sum of all values in *LONG_W*. Both results must be rounded to a scale of 2 decimal places.

Weather Observation Station 13

Query the sum of *Northern Latitudes* (*LAT_N*) from **STATION** having values greater than 38.7880 and less than 137.2345. Truncate your answer to 4 decimal places.

Input Format

The **STATION** table is described as follows:

STATION

Field	Type
ID	NUMBER
CITY	VARCHAR2(21)
STATE	VARCHAR2(2)
LAT_N	NUMBER
LONG_W	NUMBER

where *LAT_N* is the northern latitude and *LONG_W* is the western longitude.

Weather Observation Station 14

Query the greatest value of the *Northern Latitudes* (*LAT_N*) from **STATION** that is less than 137.2345. Truncate your answer to 4 decimal places.

Input Format

The **STATION** table is described as follows:

STATION

Field	Type
ID	NUMBER
CITY	VARCHAR2(21)
STATE	VARCHAR2(2)
LAT_N	NUMBER
LONG_W	NUMBER

where *LAT_N* is the northern latitude and *LONG_W* is the western longitude.

Weather Observation Station 15

Query the *Western Longitude* (*LONG_W*) for the largest *Northern Latitude* (*LAT_N*) in **STATION** that is less than 137.2345. Round your answer to 4 decimal places.

Input Format

The **STATION** table is described as follows:

STATION

Field	Type
ID	NUMBER
CITY	VARCHAR2(21)
STATE	VARCHAR2(2)
LAT_N	NUMBER
LONG_W	NUMBER

where *LAT_N* is the northern latitude and *LONG_W* is the western longitude.

Weather Observation Station 16

Query the smallest *Northern Latitude* (*LAT_N*) from **STATION** that is greater than 38.7780. Round your answer to 4 decimal places.

Input Format

The **STATION** table is described as follows:

STATION

Field	Type
ID	NUMBER
CITY	VARCHAR2(21)
STATE	VARCHAR2(2)
LAT_N	NUMBER
LONG_W	NUMBER

where *LAT_N* is the northern latitude and *LONG_W* is the western longitude.

Weather Observation Station 17

Query the *Western Longitude* (*LONG_W*) for the smallest *Northern Latitude* (*LAT_N*) in **STATION** that is greater than 38.7780. Round your answer to 4 decimal places.

Input Format

The **STATION** table is described as follows:

STATION

Field	Type
ID	NUMBER
CITY	VARCHAR2(21)
STATE	VARCHAR2(2)
LAT_N	NUMBER
LONG_W	NUMBER

where *LAT_N* is the northern latitude and *LONG_W* is the western longitude.

Weather Observation Station 18

Consider $P_1(a, b)$ and $P_2(c, d)$ to be two points on a *2D* plane.

- a happens to equal the minimum value in *Northern Latitude* (*LAT_N* in **STATION**).
- b happens to equal the minimum value in *Western Longitude* (*LONG_W* in **STATION**).
- c happens to equal the maximum value in *Northern Latitude* (*LAT_N* in **STATION**).
- d happens to equal the maximum value in *Western Longitude* (*LONG_W* in **STATION**).

Query the Manhattan Distance between points P_1 and P_2 and round it to a scale of 4 decimal places.

Input Format

The **STATION** table is described as follows:

STATION

Field	Type
ID	NUMBER
CITY	VARCHAR2(21)
STATE	VARCHAR2(2)
LAT_N	NUMBER
LONG_W	NUMBER

where *LAT_N* is the northern latitude and *LONG_W* is the western longitude.

Weather Observation Station 19

Consider $P_1(a, c)$ and $P_2(b, d)$ to be two points on a 2D plane where (a, b) are the respective minimum and maximum values of *Northern Latitude* (*LAT_N*) and (c, d) are the respective minimum and maximum values of *Western Longitude* (*LONG_W*) in **STATION**.

Query the Euclidean Distance between points P_1 and P_2 and *format your answer* to display 4 decimal digits.

Input Format

The **STATION** table is described as follows:

STATION

Field	Type
ID	NUMBER
CITY	VARCHAR2(21)
STATE	VARCHAR2(2)
LAT_N	NUMBER
LONG_W	NUMBER

where *LAT_N* is the northern latitude and *LONG_W* is the western longitude.