Practical Exam: Sample SQL Associate

Tech Solutions Inc. is a leading technology company specializing in software development and IT consulting services. The company prides itself on delivering innovative solutions to clients across various industries. With a dedicated team of skilled professionals, TechSolutions has earned a reputation for excellence in the tech industry.

Tech Solutions Inc. has been experiencing a decline in customer satisfaction ratings over the past few months. Customer feedback surveys and support tickets indicate an increase in dissatisfaction among clients. The company is concerned about this trend as it directly impacts customer retention, reputation, and overall business growth.

You are working with the customer support team to provide data to managers to help the company take proactive measures to address these concerns effectively.

Data

The following schema diagram shows the tables available.

	id	customer_id	category	status	creation_date	response_time	resolution_time
0	1	1062	Installation Problem	In Progress	2023-01-26T00:00:00.000	6	0 hours
1	2	892	Billing enquiry	Open	2023-06-18T00:00:00.000	3	0 hours
2	3	433	Feedback	Open	2023-08-17T00:00:00.000	1	0 hours
3	6	764	Billing enquiry	Open	2023-01-16T00:00:00.000	3	0 hours
4	7	1144	Billing enquiry	Open	2023-06-01T00:00:00.000	2	0 hours
5	8	288	Feedback	Open	2023-01-22T00:00:00.000	2	0 hours
6	9	1495	Bug	In Progress	2023-02-05T00:00:00.000	1	0 hours
7	10	1090	Bug	In Progress	2023-05-09T00:00:00.000	3	0 hours
8	11	1397	Feedback	In Progress	2023-09-17T00:00:00.000	2	0 hours
9	12	54	Feedback	Open	2023-09-13T00:00:00.000	2	0 hours

Rows: 10 Expand

index	id	customer_id	rating	timestamp
0	1	693	3	2023-12-01T00:00:00.000
1	2	1814	5	2023-12-01T00:00:00.000
2	3	1932	5	2023-12-01T00:00:00.000
3	4	1789	5	2023-12-01T00:00:00.000
4	5	1332	2	2023-12-01T00:00:00.000
5	6	400	2	2023-12-01T00:00:00.000
6	7	139	2	2023-12-01T00:00:00.000
7	8	948	4	2023-12-01T00:00:00.000
8	9	1375	5	2023-12-01T00:00:00.000
9	10	33	2	2023-12-01T00:00:00.000

Rows: 10 Expand

index	column_name	data_type
0	id	integer
1	customer_id	integer
2	rating	integer
3	timestamp	date
4	id	integer
5	customer_id	integer
6	creation_date	date
7	response_time	integer
8	resolution_time	text
9	category	text
10	status	text

Rows: 11 Expand

Your query ran successfully but returned no results.

	cus...
0	1
1	4
2	5
3	7
4	8
5	11
6	12
7	14
8	15
9	16
10	18
11	20
12	21
13	22
14	24
15	26

Rows: 1,237 Expand

	category
0	Other
1	Bug
2	Feedback
3	Billing enquiry
4	Installation Problem

Rows: 5 Expand

	sta...
0	Open
1	Resolved
2	In Progress
3	-

Rows: 4 Expand

	creation_date
0	2023-01-01T00:00:00.000
1	2023-01-02T00:00:00.000
2	2023-01-03T00:00:00.000
3	2023-01-04T00:00:00.000
4	2023-01-05T00:00:00.000
5	2023-01-06T00:00:00.000
6	2023-01-07T00:00:00.000
7	2023-01-08T00:00:00.000
8	2023-01-09T00:00:00.000
9	2023-01-10T00:00:00.000
10	2023-01-11T00:00:00.000
11	2023-01-12T00:00:00.000
12	2023-01-13T00:00:00.000
13	2023-01-14T00:00:00.000
14	2023-01-15T00:00:00.000
15	2023-01-16T00:00:00.000

Rows: 334 Expand

	respon...
0	1
1	2
2	3
3	4
4	5
5	6
6	7
7	8
8	9
9	10
10	11
11	12
12	13
13	16
14	17

Rows: 15 Expand

	resolution...
0	0.12 hours
1	0.14 hours
2	0.15 hours
3	0.17 hours
4	0.18 hours
5	0.19 hours
6	0.21 hours
7	0.25 hours
8	0.29 hours
9	0.2 hours
10	0.36 hours
11	0.41 hours
12	0.44 hours
13	0.46 hours
14	0.47 hours
15	0.4 hours

Rows: 246 Expand

After thoroughly exploring each column of the support table, we observed the following:

1. id: PERFECT! 1987 ids. No NULLS, inconsistencies, or missing values. The PRIMARY KEY of the table.
2. customer_id: 1237 customer ids. No NULLS, inconsistencies, or missing values.
3. category: 5 distinct categories. If there are any NULLS, missing, or inconsistent values, replace them with 'Others'.
4. status: 4 distinct status updates. One inconsistent value found: '-'. Need to replace it with 'Resolved'.
5. creation_date: 334 distinct dates. If there are any NULLS, missing, or inconsistent values, replace them with '2023-01-01'.
6. response_time: 15 distinct days. If there are any NULLS, missing, or inconsistent values, replace them with '0'.
7. resolution_time: 246 distinct hours. If there are any NULLS, missing, or inconsistent values, replace them with '0'.

Make sure to cast the columns carefully.

	cus...
0	11
1	29
2	33
3	34
4	51
5	59
6	68
7	87
8	125
9	139
10	159
11	161
12	167
13	190
14	214
15	215

Rows: 192 Expand

0	2
1	3
2	4
3	5
4	6
5	7

Rows: 6 Expand

	timestamp
0	2023-12-01T00:00:00.000
1	2023-12-02T00:00:00.000
2	2023-12-03T00:00:00.000
3	2023-12-04T00:00:00.000
4	2023-12-05T00:00:00.000
5	2023-12-06T00:00:00.000
6	2023-12-07T00:00:00.000
7	2023-12-08T00:00:00.000
8	2023-12-09T00:00:00.000
9	2023-12-10T00:00:00.000

Rows: 10 Expand

After thoroughly exploring each column of the support table, we observed the following:

1. survey_id: PERFECT! 1987 ids. No NULLS, inconsistencies, or missing values. The PRIMARY KEY of the table.
2. customer_id: 192 distinct customer ids.
3. rating: 6 distinct ratings
4. timestamp: 10 distinct timestamps.

Task 1

Before you can start any analysis, you need to confirm that the data is accurate and reflects what you expect to see.

It is known that there are some issues with the `support` table, and the data team have provided the following data description.

Write a query to return data matching this description. You must match all column names and description criteria.

Column Name	Criteria
id	Discrete. The unique identifier of the support ticket. Missing values are not possible due to the database structure.
customer_id	Discrete. The unique identifier of the customer. Missing values should be replaced with 0.
category	Nominal. The gategory of the support request, can be one of Feedback, Billing Enquiry, Bug, Installation Problem, Other. Missing values should be replaced with Other.
status	Nominal. The current status of the support ticket, one of Open, In Progress or Resolved. Missing values should be replaced with 'Resolved'.
creation_date	Discrete. The date the ticket was created. Can be any date in 2023. Missing values should be replaced with 2023-01-01.
response_time	Discrete. The number of days taken to respond to the support ticket. Missing values should be replaced with 0.
resolution_time	Continuos. The number of hours taken to resolve the support ticket, rounded to 2 decimal places. Missing values should be replaced with 0.

		cus...	category	sta...	creation_date	respon...	resolution...
0	1	1062	Installation Problem	In Progress	2023-01-26T00:00:00.000	6	
1	2	892	Other	Open	2023-06-18T00:00:00.000	3	
2	3	433	Feedback	Open	2023-08-17T00:00:00.000	1	
3	6	764	Other	Open	2023-01-16T00:00:00.000	3	
4	7	1144	Other	Open	2023-06-01T00:00:00.000	2	
5	8	288	Feedback	Open	2023-01-22T00:00:00.000	2	
6	9	1495	Bug	In Progress	2023-02-05T00:00:00.000	1	
7	10	1090	Bug	In Progress	2023-05-09T00:00:00.000	3	
8	11	1397	Feedback	In Progress	2023-09-17T00:00:00.000	2	
9	12	54	Feedback	Open	2023-09-13T00:00:00.000	2	

Rows: 1,987 Expand

Task 2

It is suspected that the response time to tickets is a big factor in unhappiness.

Calculate the minimum and maximum response time for each category of support ticket.

Your output should include the columns `category`, `min_response` and `max_response`.

Values should be rounded to two decimal places where appropriate.

	category	min_...	max...
0	Other	1	5
1	Bug	1	13
2	Feedback	1	2
3	Billing enquiry	2	8
4	Installation Problem	5	17

Rows: 5 Expand

Task 3

The support team want to know more about the `rating` provided by customers who reported `Bugs` or `Installation Problem`s.

Write a query to return the `rating` from the survey, the `customer_id`, `category` and `response_time` of the support ticket, for the customers & categories of interest.

Use the original support table, not the output of task 1.

		cus...	category	respon...
0	6	621	Installation Problem	7
1	5	1703	Installation Problem	6
2	5	766	Installation Problem	7
3	5	1824	Bug	3
4	4	931	Installation Problem	9
5	6	1795	Installation Problem	7
6	5	1703	Bug	2
7	2	747	Bug	2
8	5	1836	Bug	1
9	7	1882	Installation Problem	6
10	6	1882	Installation Problem	6

Rows: 123 Expand