

SN	Title	Description	Marks	Expected Output																																																																		
A. Initialization																																																																						
1	Sample data -> restore	- Load the `queue_system_sqlite3.db` into <a href="https://sqliteonline.com/">https://sqliteonline.com/</a> - Provide the screenshot of <code>"SELECT name FROM sqlite_master WHERE type='table'"</code>	10																																																																			
2	Tables Definition and their Relation	- Provide the tables' definitions and their relations.	20	<div>Click <b>[+]</b> on the left side to reveal the expected output</div> <div><b>**Tables:**</b>  1. <b>**queues**</b> - `id` (bigint(20) unsigned) - Primary Key, auto_increment - `service_id` (bigint(20) unsigned) - Foreign Key referencing `services(id)` - `number` (int(11)) - Queue number - `called` (tinyint(1)) - Indicator if the queue has been called - `reference_no` (varchar(191)) - Reference number for the queue - `letter` (varchar(191)) - Letter associated with the queue - `name` (varchar(191)) - Name of the person in the queue - `email` (varchar(191)) - Email of the person in the queue - `phone` (varchar(191)) - Phone number of the person in the queue - `position` (int(11)) - Position in the queue - `created_at` (timestamp) - Timestamp when the queue was created - `updated_at` (timestamp) - Timestamp when the queue was last updated  2. <b>**users**</b> - <b>[Ans]</b>  3. <b>**call_statuses**</b> - <b>[Ans]</b>  4. <b>**calls**</b> - <b>[Ans]</b>  5. <b>**counters**</b> - <b>[Ans]</b>   <b>**Relationships:**</b>  - <b>**calls &amp; queues:**</b> Linked by `queue_id` in the `calls` table referencing `queues(id)`.  - <b>**calls &amp; services:**</b> <b>[Ans]</b>  - <b>**calls &amp; counters:**</b> <b>[Ans]</b>  - <b>**calls &amp; users:**</b> <b>[Ans]</b>  - <b>**calls &amp; call_statuses:**</b> <b>[Ans]</b>  - <b>**queues &amp; services:**</b> <b>[Ans]</b></div>																																																																		
B. Query Building																																																																						
3	counter summary	Write an SQL query to get the summary of counters on any given date with the data such as: - <b>Total queue called, serving, served and no_show.</b> * The data in the expected output is from the date '2024-02-14'	10	<div>Click <b>[+]</b> on the left side to reveal the expected output</div> <div><table><thead><tr><th>counter_id</th><th>serving_token</th><th>called</th><th>serving</th><th>served</th><th>no_show</th></tr></thead><tbody><tr><td>1</td><td>NULL</td><td>37</td><td>0</td><td>27</td><td>10</td></tr><tr><td>2</td><td>NULL</td><td>12</td><td>0</td><td>12</td><td>0</td></tr><tr><td>3</td><td>NULL</td><td>32</td><td>0</td><td>24</td><td>8</td></tr><tr><td>4</td><td>NULL</td><td>NULL</td><td>NULL</td><td>NULL</td><td>NULL</td></tr><tr><td>5</td><td>NULL</td><td>21</td><td>0</td><td>15</td><td>6</td></tr><tr><td>6</td><td>NULL</td><td>37</td><td>0</td><td>30</td><td>7</td></tr><tr><td>7</td><td>NULL</td><td>7</td><td>0</td><td>7</td><td>0</td></tr><tr><td>8</td><td>NULL</td><td>26</td><td>0</td><td>22</td><td>4</td></tr><tr><td>9</td><td>NULL</td><td>NULL</td><td>NULL</td><td>NULL</td><td>NULL</td></tr><tr><td>10</td><td>NULL</td><td>7</td><td>0</td><td>7</td><td>0</td></tr></tbody></table></div>	counter_id	serving_token	called	serving	served	no_show	1	NULL	37	0	27	10	2	NULL	12	0	12	0	3	NULL	32	0	24	8	4	NULL	NULL	NULL	NULL	NULL	5	NULL	21	0	15	6	6	NULL	37	0	30	7	7	NULL	7	0	7	0	8	NULL	26	0	22	4	9	NULL	NULL	NULL	NULL	NULL	10	NULL	7	0	7	0
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9	NULL	NULL	NULL	NULL	NULL																																																																	
10	NULL	7	0	7	0																																																																	
4	service summary	Write an SQL query to get the summary of service on any given date with the data such as: - <b>Total visitor, queued, called, serving, served and no_show</b>	10	<div>Click <b>[+]</b> on the left side to reveal the expected output</div> <div><table><thead><tr><th>service_id</th><th>letter</th><th>visitor</th><th>queued</th><th>called</th><th>serving</th><th>served</th><th>no_show</th></tr></thead><tbody><tr><td>1</td><td>W</td><td>87</td><td>0</td><td>87</td><td>0</td><td>65</td><td>22</td></tr><tr><td>2</td><td>NR</td><td>79</td><td>0</td><td>79</td><td>0</td><td>68</td><td>11</td></tr><tr><td>3</td><td>T</td><td>13</td><td>0</td><td>13</td><td>0</td><td>11</td><td>2</td></tr></tbody></table></div>	service_id	letter	visitor	queued	called	serving	served	no_show	1	W	87	0	87	0	65	22	2	NR	79	0	79	0	68	11	3	T	13	0	13	0	11	2																																		
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2	NR	79	0	79	0	68	11																																																															
3	T	13	0	13	0	11	2																																																															
5	service x counter summary	Write an SQL query to get the summary of service wrt to counter on any given date with the data such as: - <b>Total visitor, queued, called, serving, served and no_show</b>	10	<div>Click <b>[+]</b> on the left side to reveal the expected output</div>																																																																		

service_id	letter	counter_id	visitor	queued	called	serving	served	no_show
1	W	1	35	8	35	8	26	9
1	W	2	4	8	4	8	4	6
1	W	3	15	8	15	8	9	6
1	W	5	19	8	19	8	13	6
1	W	6	18	8	18	8	10	6
1	W	6	4	8	4	8	3	1
2	NR	1	2	8	2	8	1	1
2	NR	2	6	8	6	8	8	6
2	NR	3	4	8	4	8	4	6
2	NR	5	2	8	2	8	2	6
2	NR	6	27	8	27	8	20	7
2	NR	7	7	8	7	8	7	6
2	NR	8	22	8	22	8	19	3
2	NR	18	7	8	7	8	7	6
3	T	3	13	8	13	8	11	2

6 agent summary

Write an SQL query to get the summary of agent wrt to service on any given date with the data such as:  
- Total visitor, queued, called, serving, served and no\_show

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Click **[+]** on the left side to reveal the expected output

name	letter	visitor	queued	called	serving	served
Ajaya Limbu	NR	7	8	7	8	7
Bishnu Pd Marasini	NR	27	8	27	8	20
Bishnu Pd Marasini	W	10	8	10	8	19
Chhiring Ghale	NR	4	8	4	8	4
Chhiring Ghale	T	13	8	13	8	11
Chhiring Ghale	W	15	8	15	8	9
Lokendra Sunar	NR	22	8	22	8	19
Lokendra Sunar	W	4	8	4	8	3
Mahina Kalikote	W	35	8	35	8	26
Rahul Khadka	NR	9	8	9	8	8
Sagar Magar	NR	2	8	2	8	2
Sagar Magar	W	19	8	19	8	13
Suyog Tamang	NR	8	8	8	8	8
Suyog Tamang	W	4	8	4	8	4

C. Exploratory Data Analysis

Query the desired output and use the **export csv** features from the **sqliteonline**

7 Service Efficiency Analysis

Click **[+]** on the left side to reveal the descriptions

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Click **[+]** on the left side to reveal the expected output

**Objective:** Analyze the efficiency of services provided at different counters using the available data. The analysis should identify patterns and insights related to waiting times, service times, and the volume of customers served.

**Task Details:**

**1. Data Preparation (5 Marks)**

- Clean and preprocess the data from the relevant tables ('calls', 'queues', 'services', 'counters', 'users').
- Handle any missing values, inconsistencies, or outliers in the dataset.

**2. Descriptive Statistics (5 Marks)**

- Calculate descriptive statistics such as mean, median, and standard deviation for key metrics, including waiting time, served time, and turn-around time.

**3. Visualizations (5 Marks)**

- Create visualizations to illustrate the distribution of key metrics (e.g., histograms, box plots).
- Generate line or bar charts to show trends over time, such as the number of customers served per day or the average waiting time per day.

**4. Correlation and Insights (10 Marks)**

- Analyze the correlation between different variables, such as waiting time and served time, or the number of counters and the volume of customers served.
- Identify any trends, anomalies, or patterns in the data, such as peak hours, underperforming counters, or services with higher wait times.
- Provide insights and recommendations based on the findings, such as optimizing counter staffing during peak hours or improving service efficiency for specific services.

This EDA task is designed to evaluate the participant's ability to handle data cleaning, statistical analysis, and visualization, and to draw meaningful insights from the data, which are crucial skills in data science.

**Expected Output:**

- A detailed report or presentation including:
  - A summary of the data preparation process.
  - Key descriptive statistics with interpretations.
  - Visualizations with explanations.
  - An analysis of correlations and patterns.
  - Insights and actionable recommendations based on the analysis.

TOTAL: 100