



# Call Center Performance Analysis (SQL Project)

This project analyzes call center performance data across three months (February, March, and April) using SQL in MS SQL Server.

The main objective is to extract meaningful insights related to agent performance, call handling efficiency, and service quality metrics such as ASA and abandoned calls. All queries are executed in Jupyter Notebook using SQL Magic (%sql) and Windows Authentication.

## Key Topics Covered:

- Data consolidation using UNION ALL
- Aggregation and filtering
- Performance metrics per agent
- CASE statements for service level classification
- Subqueries and Views

This project is part of my SQL practice portfolio and demonstrates my ability to work with real operational datasets.

## Importing the Data:-

```
In [1]: %load_ext sql
```

```
In [5]: %sql mssql+pyodbc://@DESKTOP-0F81S6G/SallaProject?driver=ODBC+Driver+17+for+SQL+Server&trusted_connection=yes
```

## Combine All Tables (View)

```
In [6]: %%sql
CREATE VIEW All_Months AS
SELECT * FROM CallCenter_Feb
UNION ALL
SELECT * FROM CallCenter_Mar
UNION ALL
SELECT * FROM CallCenter_Apr;
```

```
* mssql+pyodbc://@DESKTOP-0F81S6G/SallaProject?driver=ODBC+Driver+17+for+SQL+Server&trusted_connection=yes
Done.
```

```
Out[6]: []
```

```
In [7]: %%sql

SELECT TOP 5 * FROM All_Months;
```

```
* mssql+pyodbc://@DESKTOP-0F81S6G/SallaProject?driver=ODBC+Driver+17+for+SQL+Server&trusted_connection=yes
Done.
```

Out[7]:

| Project   | Date       | Month  | Forecasted_Calls | Calls_Offered | Calls_Handled | Calls_Handled_With_in_Thrshold | Calls_Abandon |
|-----------|------------|--------|------------------|---------------|---------------|--------------------------------|---------------|
| Project A | 2022-02-01 | 22-Feb | 13473            | 8393          | 8381          | 8380                           | 12            |
| Project A | 2022-02-02 | 22-Feb | 13255            | 5144          | 5134          | 5096                           | 10            |
| Project A | 2022-02-03 | 22-Feb | 13209            | 8450          | 8436          | 8432                           | 14            |
| Project A | 2022-02-04 | 22-Feb | 13002            | 10883         | 10614         | 7376                           | 269           |
| Project A | 2022-02-05 | 22-Feb | 12758            | 11445         | 11393         | 11027                          | 52            |

Q1: Retrieve all records related to the Agent Named "Rania"

In [8]:

```
%%sql

SELECT * FROM All_Months
WHERE Agent_Name = 'Rania';
```

\* mssql+pyodbc://@DESKTOP-0F81S6G/SallaProject?driver=ODBC+Driver+17+for+SQL+Server&trusted\_connection=yes

Done.

Out[8]:

| Project   | Date       | Month  | Forecasted_Calls | Calls_Offered | Calls_Handled | Calls_Handled_With_in_Threshold | Calls_Abandon |
|-----------|------------|--------|------------------|---------------|---------------|---------------------------------|---------------|
| Project A | 2022-02-03 | 22-Feb | 13209            | 8450          | 8436          | 8432                            | 14            |
| Project A | 2022-02-04 | 22-Feb | 13002            | 10883         | 10614         | 7376                            | 269           |
| Project A | 2022-02-11 | 22-Feb | 13002            | 8178          | 8166          | 8163                            | 12            |
| Project A | 2022-02-16 | 22-Feb | 13255            | 7792          | 7778          | 7758                            | 14            |
| Project A | 2022-02-21 | 22-Feb | 11943            | 7101          | 7093          | 7093                            | 8             |
| Project B | 2022-02-01 | 22-Feb | 13173            | 6890          | 6884          | 6884                            | 6             |
| Project B | 2022-02-13 | 22-Feb | 10209            | 4809          | 4806          | 4785                            | 3             |
| Project B | 2022-02-27 | 22-Feb | 10209            | 7363          | 7311          | 6579                            | 52            |
| Project C | 2022-02-05 | 22-Feb | 281              | 168           | 168           | 164                             | 0             |
| Project A | 2022-03-03 | Mar-22 | 12545            | 13946         | 13256         | 5411                            | 690           |
| Project B | 2022-03-04 | Mar-22 | 12818            | 15270         | 13785         | 8615                            | 1485          |
| Project B | 2022-03-28 | Mar-22 | 17370            | 18046         | 17926         | 17727                           | 120           |
| Project C | 2022-03-06 | Mar-22 | 2825             | 3047          | 3035          | 2997                            | 12            |
| Project C | 2022-03-13 | Mar-22 | 2825             | 2118          | 2109          | 2088                            | 9             |
| Project C | 2022-03-18 | Mar-22 | 1989             | 1529          | 1518          | 1435                            | 11            |
| Project C | 2022-03-25 | Mar-22 | 1989             | 1759          | 1743          | 1659                            | 16            |
| Project C | 2022-03-27 | Mar-22 | 2825             | 1989          | 1984          | 1972                            | 5             |
| Project A | 2022-04-02 | Apr-22 | 12028            | 6184          | 6160          | 6129                            | 24            |
| Project A | 2022-04-28 | Apr-22 | 12847            | 9891          | 9757          | 8284                            | 134           |
| Project B | 2022-04-16 | Apr-22 | 11769            | 4711          | 4700          | 4608                            | 11            |
| Project B | 2022-04-18 | Apr-22 | 13042            | 5414          | 5410          | 5410                            | 4             |

Q2: Display the Number of Calls Offered for each day

In [9]:

```
%%sql
SELECT Date, SUM(Calls_Offered) AS Total_Offered_Calls
FROM All_Months
```

```
GROUP BY Date  
ORDER BY Date;
```

```
* mssql+pyodbc://@DESKTOP-0F81S6G/SallaProject?driver=ODBC+Driver+17+for+SQL+Server&trusted_connection=yes  
Done.
```

Out[9]:

| Date       | Total_Offered_Calls |
|------------|---------------------|
| 2022-02-01 | 15384               |
| 2022-02-02 | 9473                |
| 2022-02-03 | 15376               |
| 2022-02-04 | 19880               |
| 2022-02-05 | 20733               |
| 2022-02-06 | 20580               |
| 2022-02-07 | 22320               |
| 2022-02-08 | 20203               |
| 2022-02-09 | 17795               |
| 2022-02-10 | 17920               |
| 2022-02-11 | 14940               |
| 2022-02-12 | 13522               |
| 2022-02-13 | 10813               |
| 2022-02-14 | 11919               |
| 2022-02-15 | 13791               |
| 2022-02-16 | 14260               |
| 2022-02-17 | 14250               |
| 2022-02-18 | 13320               |
| 2022-02-19 | 15216               |
| 2022-02-20 | 12076               |
| 2022-02-21 | 12910               |
| 2022-02-22 | 14128               |
| 2022-02-23 | 13785               |
| 2022-02-24 | 17521               |
| 2022-02-25 | 15882               |
| 2022-02-26 | 24992               |
| 2022-02-27 | 16287               |
| 2022-02-28 | 16941               |
| 2022-03-01 | 32829               |
| 2022-03-02 | 37157               |
| 2022-03-03 | 35311               |
| 2022-03-04 | 29613               |
| 2022-03-05 | 35249               |
| 2022-03-06 | 40114               |
| 2022-03-07 | 37002               |
| 2022-03-08 | 29492               |
| 2022-03-09 | 27000               |
| 2022-03-10 | 30425               |

|            |       |
|------------|-------|
| 2022-03-11 | 22167 |
| 2022-03-12 | 26059 |
| 2022-03-13 | 25267 |
| 2022-03-14 | 24532 |
| 2022-03-15 | 24457 |
| 2022-03-16 | 23468 |
| 2022-03-17 | 22115 |
| 2022-03-18 | 21641 |
| 2022-03-19 | 22206 |
| 2022-03-20 | 24781 |
| 2022-03-21 | 25090 |
| 2022-03-22 | 22897 |
| 2022-03-23 | 23074 |
| 2022-03-24 | 43452 |
| 2022-03-25 | 25964 |
| 2022-03-26 | 22056 |
| 2022-03-27 | 30420 |
| 2022-03-28 | 28714 |
| 2022-03-29 | 28798 |
| 2022-03-30 | 27647 |
| 2022-03-31 | 27202 |
| 2022-04-01 | 15199 |
| 2022-04-02 | 11352 |
| 2022-04-03 | 13486 |
| 2022-04-04 | 14234 |
| 2022-04-05 | 19612 |
| 2022-04-06 | 18845 |
| 2022-04-07 | 20663 |
| 2022-04-08 | 12783 |
| 2022-04-09 | 13358 |
| 2022-04-10 | 15616 |
| 2022-04-11 | 13380 |
| 2022-04-12 | 12189 |
| 2022-04-13 | 12481 |
| 2022-04-14 | 12044 |
| 2022-04-15 | 10384 |
| 2022-04-16 | 10575 |
| 2022-04-17 | 11984 |
| 2022-04-18 | 12093 |

|            |       |
|------------|-------|
| 2022-04-19 | 12225 |
| 2022-04-20 | 12556 |
| 2022-04-21 | 12437 |
| 2022-04-22 | 10374 |
| 2022-04-23 | 11291 |
| 2022-04-24 | 13949 |
| 2022-04-25 | 15108 |
| 2022-04-26 | 15172 |
| 2022-04-27 | 19791 |
| 2022-04-28 | 18207 |
| 2022-04-29 | 15390 |
| 2022-04-30 | 15691 |

### Q3: List all unique Agent Names

In [10]: `%%sql`

```
SELECT DISTINCT Agent_Name
FROM All_Months;
```

\* mssql+pyodbc://@DESKTOP-0F81S6G/SallaProject?driver=ODBC+Driver+17+for+SQL+Server&trusted\_connection=yes  
Done.

Out[10]: **Agent\_Name**

|         |
|---------|
| Ahmed   |
| Ali     |
| Dina    |
| Fatma   |
| Hassan  |
| Huda    |
| Khaled  |
| Laila   |
| Mona    |
| Nour    |
| Omar    |
| Rania   |
| Samir   |
| Sara    |
| Tariq   |
| Youssef |

### Q4: Average ASA (Average Speed of Answer)

In [11]: `%%sql`

```
SELECT cast(Avg(ASA) as decimal(10,3)) AS AVG_ASA
FROM All_Months;
```

\* mssql+pyodbc://@DESKTOP-0F81S6G/SallaProject?driver=ODBC+Driver+17+for+SQL+Server&trusted\_connection=yes  
Done.

Out[11]: **AVG\_ASA**

9.221

## Q5: Sort the data by the Number of Abandoned Calls in Descending Order

In [13]: **%%sql**

```
SELECT *
FROM All_Months
ORDER BY Calls_Abandon desc;
```

\* mssql+pyodbc://@DESKTOP-0F81S6G/SallaProject?driver=ODBC+Driver+17+for+SQL+Server&trusted\_connection=yes  
Done.

| Out[13]: | Project   | Date       | Month  | Forecasted_Calls | Calls_Offered | Calls_Handled | Calls_Handled_With_in_Threshold | Calls_Abandon |   |
|----------|-----------|------------|--------|------------------|---------------|---------------|---------------------------------|---------------|---|
|          | Project B | 2022-03-05 | Mar-22 | 15654            | 17965         | 14864         | 5868                            | 3101          | 1 |
|          | Project B | 2022-03-06 | Mar-22 | 17684            | 21739         | 19805         | 11749                           | 1934          |   |
|          | Project B | 2022-03-04 | Mar-22 | 12818            | 15270         | 13785         | 8615                            | 1485          | 1 |
|          | Project B | 2022-03-03 | Mar-22 | 16064            | 18290         | 16900         | 6847                            | 1390          |   |
|          | Project B | 2022-03-02 | Mar-22 | 16778            | 19001         | 17785         | 10398                           | 1216          |   |
|          | Project A | 2022-03-05 | Mar-22 | 12209            | 14504         | 13476         | 6228                            | 1028          | 1 |
|          | Project A | 2022-03-04 | Mar-22 | 9970             | 11663         | 10884         | 7211                            | 779           |   |
|          | Project B | 2022-03-24 | Mar-22 | 16064            | 30381         | 29630         | 22741                           | 751           |   |
|          | Project A | 2022-03-03 | Mar-22 | 12545            | 13946         | 13256         | 5411                            | 690           |   |
|          | Project A | 2022-03-06 | Mar-22 | 13843            | 15328         | 14652         | 9230                            | 676           |   |
|          | Project A | 2022-03-02 | Mar-22 | 13134            | 14735         | 14092         | 7895                            | 643           |   |
|          | Project B | 2022-03-10 | Mar-22 | 16064            | 17374         | 16909         | 15521                           | 465           |   |
|          | Project A | 2022-02-26 | 22-Feb | 12758            | 13437         | 12994         | 7440                            | 443           |   |
|          | Project B | 2022-02-26 | 22-Feb | 12477            | 11418         | 11046         | 6252                            | 372           |   |
|          | Project B | 2022-03-01 | Mar-22 | 17117            | 18438         | 18071         | 14792                           | 367           |   |
|          | Project A | 2022-02-04 | 22-Feb | 13002            | 10883         | 10614         | 7376                            | 269           |   |
|          | Project A | 2022-04-07 | Apr-22 | 12847            | 11176         | 10939         | 9383                            | 237           |   |
|          | Project B | 2022-03-07 | Mar-22 | 17370            | 17701         | 17475         | 16504                           | 226           |   |
|          | Project B | 2022-02-04 | 22-Feb | 12718            | 8843          | 8635          | 5974                            | 208           |   |
|          | Project B | 2022-04-07 | Apr-22 | 12559            | 9319          | 9130          | 7802                            | 189           |   |
|          | Project A | 2022-03-24 | Mar-22 | 12545            | 10378         | 10197         | 8564                            | 181           |   |
|          | Project A | 2022-04-27 | Apr-22 | 13093            | 10756         | 10579         | 9435                            | 177           |   |
|          | Project B | 2022-03-09 | Mar-22 | 16778            | 15106         | 14952         | 14350                           | 154           |   |
|          | Project A | 2022-03-01 | Mar-22 | 13389            | 11747         | 11596         | 9291                            | 151           |   |

|  |           |            |        |       |       |       |       |     |
|--|-----------|------------|--------|-------|-------|-------|-------|-----|
|  | Project B | 2022-03-08 | Mar-22 | 17117 | 16261 | 16118 | 15893 | 143 |
|  | Project B | 2022-03-27 | Mar-22 | 17685 | 18343 | 18200 | 17873 | 143 |
|  | Project B | 2022-03-11 | Mar-22 | 12818 | 13395 | 13260 | 12637 | 135 |
|  | Project B | 2022-04-27 | Apr-22 | 12802 | 8869  | 8734  | 7807  | 135 |
|  | Project A | 2022-04-28 | Apr-22 | 12847 | 9891  | 9757  | 8284  | 134 |
|  | Project A | 2022-04-29 | Apr-22 | 10496 | 8428  | 8294  | 6923  | 134 |
|  | Project A | 2022-03-10 | Mar-22 | 12545 | 10402 | 10275 | 9585  | 127 |
|  | Project B | 2022-03-28 | Mar-22 | 17370 | 18046 | 17926 | 17727 | 120 |
|  | Project B | 2022-03-17 | Mar-22 | 16064 | 13611 | 13494 | 13462 | 117 |
|  | Project B | 2022-03-18 | Mar-22 | 12818 | 14427 | 14319 | 14155 | 108 |
|  | Project B | 2022-03-20 | Mar-22 | 17685 | 15677 | 15573 | 15556 | 104 |
|  | Project B | 2022-04-29 | Apr-22 | 10277 | 6825  | 6722  | 5582  | 103 |
|  | Project B | 2022-04-28 | Apr-22 | 12559 | 8167  | 8066  | 6859  | 101 |
|  | Project A | 2022-03-07 | Mar-22 | 13585 | 16324 | 16223 | 15445 | 101 |
|  | Project B | 2022-03-19 | Mar-22 | 15655 | 14008 | 13908 | 13880 | 100 |
|  | Project B | 2022-03-13 | Mar-22 | 17685 | 14825 | 14725 | 14702 | 100 |
|  | Project B | 2022-03-16 | Mar-22 | 16778 | 14304 | 14211 | 14204 | 93  |
|  | Project B | 2022-03-22 | Mar-22 | 17117 | 14294 | 14202 | 14190 | 92  |
|  | Project B | 2022-03-21 | Mar-22 | 17370 | 16320 | 16229 | 16177 | 91  |
|  | Project B | 2022-03-30 | Mar-22 | 16778 | 16005 | 15914 | 15904 | 91  |
|  | Project B | 2022-03-31 | Mar-22 | 16064 | 16001 | 15910 | 15907 | 91  |
|  | Project B | 2022-03-25 | Mar-22 | 12818 | 15592 | 15501 | 15358 | 91  |
|  | Project B | 2022-03-26 | Mar-22 | 15655 | 13821 | 13732 | 13716 | 89  |
|  | Project B | 2022-03-14 | Mar-22 | 17370 | 14415 | 14326 | 14326 | 89  |

|  |           |            |        |       |       |       |       |    |
|--|-----------|------------|--------|-------|-------|-------|-------|----|
|  | Project B | 2022-03-12 | Mar-22 | 15655 | 15160 | 15072 | 15006 | 88 |
|  | Project B | 2022-03-29 | Mar-22 | 17117 | 17228 | 17142 | 17102 | 86 |
|  | Project B | 2022-03-15 | Mar-22 | 17117 | 14483 | 14398 | 14387 | 85 |
|  | Project B | 2022-03-23 | Mar-22 | 16778 | 14484 | 14402 | 14379 | 82 |
|  | Project A | 2022-02-27 | 22-Feb | 10422 | 8794  | 8723  | 7837  | 71 |
|  | Project A | 2022-04-05 | Apr-22 | 13300 | 10632 | 10570 | 9629  | 62 |
|  | Project A | 2022-02-06 | 22-Feb | 10422 | 11324 | 11266 | 10789 | 58 |
|  | Project A | 2022-03-27 | Mar-22 | 13841 | 10088 | 10032 | 9874  | 56 |
|  | Project C | 2022-03-04 | Mar-22 | 1989  | 2680  | 2625  | 2269  | 55 |
|  | Project A | 2022-02-05 | 22-Feb | 12758 | 11445 | 11393 | 11027 | 52 |
|  | Project B | 2022-02-27 | 22-Feb | 10209 | 7363  | 7311  | 6579  | 52 |
|  | Project A | 2022-04-09 | Apr-22 | 12028 | 7233  | 7185  | 7015  | 48 |
|  | Project A | 2022-04-21 | Apr-22 | 12847 | 6713  | 6666  | 6202  | 47 |
|  | Project A | 2022-04-06 | Apr-22 | 13093 | 10227 | 10180 | 9543  | 47 |
|  | Project A | 2022-03-08 | Mar-22 | 13389 | 10822 | 10775 | 10647 | 47 |
|  | Project B | 2022-04-05 | Apr-22 | 13006 | 8792  | 8746  | 7977  | 46 |
|  | Project A | 2022-03-11 | Mar-22 | 9970  | 6966  | 6922  | 6577  | 44 |
|  | Project A | 2022-02-19 | 22-Feb | 12758 | 8307  | 8264  | 7705  | 43 |
|  | Project A | 2022-03-09 | Mar-22 | 13134 | 9565  | 9523  | 9269  | 42 |
|  | Project C | 2022-03-03 | Mar-22 | 2674  | 3075  | 3033  | 2839  | 42 |
|  | Project B | 2022-04-21 | Apr-22 | 12559 | 5611  | 5571  | 5180  | 40 |
|  | Project B | 2022-02-05 | 22-Feb | 12477 | 9120  | 9081  | 8788  | 39 |
|  | Project B | 2022-02-06 | 22-Feb | 10209 | 9097  | 9059  | 8691  | 38 |
|  | Project A | 2022-03-28 | Mar-22 | 13585 | 8739  | 8701  | 8650  | 38 |

|  |           |            |        |       |       |       |       |    |
|--|-----------|------------|--------|-------|-------|-------|-------|----|
|  | Project A | 2022-03-29 | Mar-22 | 13389 | 9200  | 9164  | 9156  | 36 |
|  | Project C | 2022-03-10 | Mar-22 | 2674  | 2649  | 2613  | 2406  | 36 |
|  | Project C | 2022-03-05 | Mar-22 | 2297  | 2780  | 2746  | 2399  | 34 |
|  | Project B | 2022-04-06 | Apr-22 | 12802 | 8467  | 8433  | 7880  | 34 |
|  | Project C | 2022-03-02 | Mar-22 | 2711  | 3421  | 3387  | 3081  | 34 |
|  | Project A | 2022-03-15 | Mar-22 | 13389 | 7914  | 7883  | 7883  | 31 |
|  | Project A | 2022-03-16 | Mar-22 | 13134 | 7166  | 7135  | 7132  | 31 |
|  | Project A | 2022-03-25 | Mar-22 | 9970  | 8613  | 8582  | 8504  | 31 |
|  | Project A | 2022-03-26 | Mar-22 | 12209 | 6648  | 6617  | 6613  | 31 |
|  | Project A | 2022-03-21 | Mar-22 | 13585 | 6992  | 6963  | 6958  | 29 |
|  | Project A | 2022-03-31 | Mar-22 | 12545 | 8901  | 8872  | 8871  | 29 |
|  | Project C | 2022-03-07 | Mar-22 | 2799  | 2977  | 2948  | 2756  | 29 |
|  | Project A | 2022-04-08 | Apr-22 | 10496 | 6980  | 6951  | 6664  | 29 |
|  | Project A | 2022-04-03 | Apr-22 | 13569 | 7339  | 7310  | 7271  | 29 |
|  | Project A | 2022-03-30 | Mar-22 | 13134 | 9099  | 9071  | 9068  | 28 |
|  | Project A | 2022-03-20 | Mar-22 | 13841 | 7325  | 7297  | 7289  | 28 |
|  | Project A | 2022-03-12 | Mar-22 | 12209 | 8046  | 8019  | 7983  | 27 |
|  | Project A | 2022-03-17 | Mar-22 | 12545 | 6641  | 6615  | 6600  | 26 |
|  | Project A | 2022-03-18 | Mar-22 | 9970  | 5685  | 5659  | 5637  | 26 |
|  | Project A | 2022-03-22 | Mar-22 | 13389 | 6923  | 6897  | 6897  | 26 |
|  | Project A | 2022-04-01 | Apr-22 | 10496 | 8358  | 8332  | 8329  | 26 |
|  | Project A | 2022-04-02 | Apr-22 | 12028 | 6184  | 6160  | 6129  | 24 |
|  | Project A | 2022-02-07 | 22-Feb | 11943 | 12155 | 12131 | 11945 | 24 |
|  | Project B | 2022-02-19 | 22-Feb | 12477 | 6753  | 6729  | 6291  | 24 |

|  |           |            |        |       |       |       |       |    |
|--|-----------|------------|--------|-------|-------|-------|-------|----|
|  | Project A | 2022-02-28 | 22-Feb | 11943 | 9196  | 9173  | 9030  | 23 |
|  | Project C | 2022-03-08 | Mar-22 | 2771  | 2409  | 2386  | 2237  | 23 |
|  | Project C | 2022-03-12 | Mar-22 | 2297  | 2853  | 2831  | 2602  | 22 |
|  | Project C | 2022-03-01 | Mar-22 | 2771  | 2644  | 2622  | 2469  | 22 |
|  | Project A | 2022-03-13 | Mar-22 | 13841 | 8324  | 8303  | 8280  | 21 |
|  | Project B | 2022-04-03 | Apr-22 | 13261 | 6022  | 6001  | 5971  | 21 |
|  | Project C | 2022-04-09 | Apr-22 | 259   | 142   | 121   | 105   | 21 |
|  | Project C | 2022-03-09 | Mar-22 | 2710  | 2329  | 2309  | 2241  | 20 |
|  | Project A | 2022-03-14 | Mar-22 | 13585 | 7904  | 7884  | 7884  | 20 |
|  | Project A | 2022-03-23 | Mar-22 | 13134 | 6788  | 6768  | 6765  | 20 |
|  | Project A | 2022-02-08 | 22-Feb | 13473 | 11064 | 11044 | 10881 | 20 |
|  | Project C | 2022-03-24 | Mar-22 | 2674  | 2693  | 2674  | 2646  | 19 |
|  | Project B | 2022-04-01 | Apr-22 | 10277 | 6707  | 6689  | 6689  | 18 |
|  | Project B | 2022-04-09 | Apr-22 | 11769 | 5983  | 5965  | 5839  | 18 |
|  | Project A | 2022-04-16 | Apr-22 | 12028 | 5736  | 5718  | 5603  | 18 |
|  | Project A | 2022-04-14 | Apr-22 | 12847 | 6552  | 6535  | 6454  | 17 |
|  | Project A | 2022-03-19 | Mar-22 | 12209 | 6476  | 6459  | 6452  | 17 |
|  | Project A | 2022-04-26 | Apr-22 | 13300 | 8236  | 8220  | 8093  | 16 |
|  | Project A | 2022-04-30 | Apr-22 | 12028 | 8592  | 8576  | 8443  | 16 |
|  | Project C | 2022-03-25 | Mar-22 | 1989  | 1759  | 1743  | 1659  | 16 |
|  | Project C | 2022-03-29 | Mar-22 | 2771  | 2370  | 2355  | 2341  | 15 |
|  | Project C | 2022-03-14 | Mar-22 | 2798  | 2213  | 2198  | 2172  | 15 |
|  | Project A | 2022-04-25 | Apr-22 | 13349 | 8179  | 8164  | 8144  | 15 |
|  | Project C | 2022-03-17 | Mar-22 | 2674  | 1863  | 1849  | 1819  | 14 |

|           |            |        |       |       |      |      |    |
|-----------|------------|--------|-------|-------|------|------|----|
| Project A | 2022-02-03 | 22-Feb | 13209 | 8450  | 8436 | 8432 | 14 |
| Project A | 2022-02-12 | 22-Feb | 12758 | 7393  | 7379 | 7377 | 14 |
| Project A | 2022-02-16 | 22-Feb | 13255 | 7792  | 7778 | 7758 | 14 |
| Project B | 2022-02-28 | 22-Feb | 11691 | 7599  | 7585 | 7464 | 14 |
| Project A | 2022-02-15 | 22-Feb | 13473 | 7562  | 7549 | 7546 | 13 |
| Project A | 2022-02-22 | 22-Feb | 13473 | 7697  | 7684 | 7684 | 13 |
| Project B | 2022-02-07 | 22-Feb | 11691 | 10002 | 9989 | 9845 | 13 |
| Project A | 2022-04-10 | Apr-22 | 13569 | 8505  | 8492 | 8371 | 13 |
| Project B | 2022-04-02 | Apr-22 | 11769 | 5084  | 5071 | 5050 | 13 |
| Project C | 2022-04-07 | Apr-22 | 288   | 168   | 155  | 134  | 13 |
| Project A | 2022-04-11 | Apr-22 | 13349 | 7263  | 7251 | 7163 | 12 |
| Project C | 2022-03-06 | Mar-22 | 2825  | 3047  | 3035 | 2997 | 12 |
| Project A | 2022-02-11 | 22-Feb | 13002 | 8178  | 8166 | 8163 | 12 |
| Project A | 2022-02-09 | 22-Feb | 13255 | 9729  | 9717 | 9717 | 12 |
| Project A | 2022-02-01 | 22-Feb | 13473 | 8393  | 8381 | 8380 | 12 |
| Project C | 2022-02-26 | 22-Feb | 281   | 137   | 125  | 85   | 12 |
| Project B | 2022-02-08 | 22-Feb | 13173 | 8953  | 8942 | 8809 | 11 |
| Project A | 2022-02-25 | 22-Feb | 13002 | 8658  | 8647 | 8629 | 11 |
| Project C | 2022-03-18 | Mar-22 | 1989  | 1529  | 1518 | 1435 | 11 |
| Project A | 2022-04-04 | Apr-22 | 13349 | 7770  | 7759 | 7666 | 11 |
| Project A | 2022-04-20 | Apr-22 | 13093 | 6787  | 6776 | 6769 | 11 |
| Project A | 2022-04-13 | Apr-22 | 13093 | 6781  | 6770 | 6697 | 11 |
| Project B | 2022-04-08 | Apr-22 | 10277 | 5687  | 5676 | 5469 | 11 |
| Project B | 2022-04-25 | Apr-22 | 13042 | 6816  | 6805 | 6788 | 11 |

|  |           |            |        |       |      |      |      |    |
|--|-----------|------------|--------|-------|------|------|------|----|
|  | Project B | 2022-04-26 | Apr-22 | 13006 | 6772 | 6761 | 6656 | 11 |
|  | Project B | 2022-04-16 | Apr-22 | 11769 | 4711 | 4700 | 4608 | 11 |
|  | Project C | 2022-04-08 | Apr-22 | 219   | 116  | 106  | 82   | 10 |
|  | Project C | 2022-03-31 | Mar-22 | 2674  | 2300 | 2290 | 2251 | 10 |
|  | Project A | 2022-02-02 | 22-Feb | 13255 | 5144 | 5134 | 5096 | 10 |
|  | Project A | 2022-02-10 | 22-Feb | 13208 | 9832 | 9822 | 9818 | 10 |
|  | Project A | 2022-02-14 | 22-Feb | 11943 | 6506 | 6496 | 6496 | 10 |
|  | Project A | 2022-02-20 | 22-Feb | 10422 | 6601 | 6592 | 6570 | 9  |
|  | Project C | 2022-03-30 | Mar-22 | 2710  | 2543 | 2534 | 2510 | 9  |
|  | Project C | 2022-03-15 | Mar-22 | 2771  | 2060 | 2051 | 2035 | 9  |
|  | Project C | 2022-03-21 | Mar-22 | 2798  | 1778 | 1769 | 1761 | 9  |
|  | Project C | 2022-03-13 | Mar-22 | 2825  | 2118 | 2109 | 2088 | 9  |
|  | Project B | 2022-04-30 | Apr-22 | 11769 | 6999 | 6990 | 6892 | 9  |
|  | Project B | 2022-04-14 | Apr-22 | 12559 | 5361 | 5352 | 5287 | 9  |
|  | Project B | 2022-04-20 | Apr-22 | 12802 | 5635 | 5626 | 5621 | 9  |
|  | Project B | 2022-04-13 | Apr-22 | 12802 | 5605 | 5597 | 5539 | 8  |
|  | Project C | 2022-04-27 | Apr-22 | 291   | 166  | 158  | 145  | 8  |
|  | Project C | 2022-03-19 | Mar-22 | 2297  | 1722 | 1714 | 1645 | 8  |
|  | Project B | 2022-04-11 | Apr-22 | 13042 | 6021 | 6013 | 5939 | 8  |
|  | Project A | 2022-02-21 | 22-Feb | 11943 | 7101 | 7093 | 7093 | 8  |
|  | Project A | 2022-02-13 | 22-Feb | 10422 | 5904 | 5896 | 5869 | 8  |
|  | Project B | 2022-02-12 | 22-Feb | 12477 | 6015 | 6007 | 6007 | 8  |
|  | Project B | 2022-02-03 | 22-Feb | 12921 | 6790 | 6783 | 6781 | 7  |
|  | Project C | 2022-02-06 | 22-Feb | 213   | 159  | 152  | 141  | 7  |

|           |            |        |       |      |      |      |   |
|-----------|------------|--------|-------|------|------|------|---|
| Project A | 2022-02-23 | 22-Feb | 13255 | 7516 | 7509 | 7509 | 7 |
| Project A | 2022-02-24 | 22-Feb | 13208 | 9538 | 9531 | 9531 | 7 |
| Project B | 2022-04-04 | Apr-22 | 13042 | 6333 | 6326 | 6245 | 7 |
| Project A | 2022-04-15 | Apr-22 | 10496 | 5638 | 5631 | 5578 | 7 |
| Project C | 2022-03-20 | Mar-22 | 2825  | 1779 | 1772 | 1768 | 7 |
| Project C | 2022-04-28 | Apr-22 | 288   | 149  | 142  | 130  | 7 |
| Project C | 2022-03-16 | Mar-22 | 2711  | 1998 | 1992 | 1967 | 6 |
| Project C | 2022-03-11 | Mar-22 | 1989  | 1806 | 1800 | 1766 | 6 |
| Project C | 2022-03-26 | Mar-22 | 2297  | 1587 | 1581 | 1552 | 6 |
| Project A | 2022-04-17 | Apr-22 | 13568 | 6526 | 6520 | 6519 | 6 |
| Project A | 2022-04-19 | Apr-22 | 13300 | 6623 | 6617 | 6617 | 6 |
| Project B | 2022-04-10 | Apr-22 | 13261 | 6979 | 6973 | 6881 | 6 |
| Project B | 2022-02-01 | 22-Feb | 13173 | 6890 | 6884 | 6884 | 6 |
| Project B | 2022-02-02 | 22-Feb | 12956 | 4248 | 4242 | 4207 | 6 |
| Project B | 2022-02-09 | 22-Feb | 12956 | 7915 | 7909 | 7909 | 6 |
| Project B | 2022-02-10 | 22-Feb | 12920 | 7946 | 7940 | 7937 | 6 |
| Project B | 2022-02-11 | 22-Feb | 12718 | 6624 | 6618 | 6618 | 6 |
| Project C | 2022-02-04 | 22-Feb | 284   | 154  | 148  | 120  | 6 |
| Project B | 2022-02-20 | 22-Feb | 10209 | 5349 | 5343 | 5326 | 6 |
| Project B | 2022-02-25 | 22-Feb | 12718 | 7119 | 7113 | 7097 | 6 |
| Project A | 2022-02-18 | 22-Feb | 13002 | 7265 | 7259 | 7258 | 6 |
| Project B | 2022-02-16 | 22-Feb | 12956 | 6320 | 6314 | 6298 | 6 |
| Project B | 2022-02-24 | 22-Feb | 12920 | 7856 | 7851 | 7851 | 5 |
| Project B | 2022-02-22 | 22-Feb | 13173 | 6268 | 6263 | 6263 | 5 |

|           |            |        |       |      |      |      |   |
|-----------|------------|--------|-------|------|------|------|---|
| Project B | 2022-02-18 | 22-Feb | 12718 | 5922 | 5917 | 5916 | 5 |
| Project A | 2022-02-17 | 22-Feb | 13208 | 7763 | 7758 | 7758 | 5 |
| Project A | 2022-04-24 | Apr-22 | 13568 | 7557 | 7552 | 7552 | 5 |
| Project A | 2022-04-18 | Apr-22 | 13349 | 6568 | 6563 | 6563 | 5 |
| Project A | 2022-04-12 | Apr-22 | 13300 | 6635 | 6630 | 6560 | 5 |
| Project C | 2022-03-27 | Mar-22 | 2825  | 1989 | 1984 | 1972 | 5 |
| Project C | 2022-03-28 | Mar-22 | 2797  | 1929 | 1924 | 1921 | 5 |
| Project C | 2022-03-22 | Mar-22 | 2771  | 1680 | 1675 | 1668 | 5 |
| Project B | 2022-04-15 | Apr-22 | 10277 | 4662 | 4657 | 4612 | 5 |
| Project B | 2022-04-18 | Apr-22 | 13042 | 5414 | 5410 | 5410 | 4 |
| Project B | 2022-04-19 | Apr-22 | 13006 | 5479 | 5475 | 5475 | 4 |
| Project C | 2022-04-02 | Apr-22 | 259   | 84   | 80   | 75   | 4 |
| Project C | 2022-04-04 | Apr-22 | 307   | 131  | 127  | 126  | 4 |
| Project C | 2022-04-05 | Apr-22 | 294   | 188  | 184  | 156  | 4 |
| Project C | 2022-04-06 | Apr-22 | 291   | 151  | 147  | 137  | 4 |
| Project C | 2022-04-14 | Apr-22 | 288   | 131  | 127  | 125  | 4 |
| Project C | 2022-04-16 | Apr-22 | 259   | 128  | 124  | 121  | 4 |
| Project A | 2022-04-22 | Apr-22 | 10496 | 5625 | 5621 | 5618 | 4 |
| Project B | 2022-02-21 | 22-Feb | 11691 | 5672 | 5668 | 5668 | 4 |
| Project B | 2022-02-17 | 22-Feb | 12920 | 6366 | 6362 | 6362 | 4 |
| Project B | 2022-02-14 | 22-Feb | 11691 | 5302 | 5298 | 5298 | 4 |
| Project B | 2022-02-15 | 22-Feb | 13173 | 6090 | 6087 | 6085 | 3 |
| Project B | 2022-02-13 | 22-Feb | 10209 | 4809 | 4806 | 4785 | 3 |
| Project B | 2022-02-23 | 22-Feb | 12956 | 6122 | 6119 | 6119 | 3 |

|           |            |        |       |      |      |      |   |
|-----------|------------|--------|-------|------|------|------|---|
| Project C | 2022-02-07 | 22-Feb | 252   | 163  | 160  | 158  | 3 |
| Project C | 2022-02-22 | 22-Feb | 300   | 163  | 160  | 160  | 3 |
| Project A | 2022-04-23 | Apr-22 | 12028 | 6140 | 6137 | 6133 | 3 |
| Project B | 2022-04-12 | Apr-22 | 13006 | 5427 | 5424 | 5375 | 3 |
| Project C | 2022-04-10 | Apr-22 | 308   | 132  | 129  | 120  | 3 |
| Project C | 2022-04-13 | Apr-22 | 291   | 95   | 92   | 91   | 3 |
| Project B | 2022-04-17 | Apr-22 | 13261 | 5340 | 5337 | 5337 | 3 |
| Project B | 2022-04-23 | Apr-22 | 11769 | 5020 | 5017 | 5017 | 3 |
| Project B | 2022-04-24 | Apr-22 | 13261 | 6267 | 6264 | 6264 | 3 |
| Project C | 2022-04-30 | Apr-22 | 259   | 100  | 97   | 89   | 3 |
| Project B | 2022-04-22 | Apr-22 | 10277 | 4646 | 4644 | 4644 | 2 |
| Project C | 2022-03-23 | Mar-22 | 2711  | 1802 | 1800 | 1789 | 2 |
| Project C | 2022-02-19 | 22-Feb | 281   | 156  | 154  | 143  | 2 |
| Project C | 2022-02-15 | 22-Feb | 300   | 139  | 137  | 137  | 2 |
| Project C | 2022-02-16 | 22-Feb | 299   | 148  | 146  | 145  | 2 |
| Project C | 2022-02-27 | 22-Feb | 213   | 130  | 128  | 124  | 2 |
| Project C | 2022-02-25 | 22-Feb | 284   | 105  | 103  | 103  | 2 |
| Project C | 2022-02-08 | 22-Feb | 300   | 186  | 184  | 184  | 2 |
| Project C | 2022-02-10 | 22-Feb | 288   | 142  | 140  | 140  | 2 |
| Project C | 2022-02-02 | 22-Feb | 299   | 81   | 79   | 78   | 2 |
| Project C | 2022-02-03 | 22-Feb | 288   | 136  | 135  | 135  | 1 |
| Project C | 2022-02-01 | 22-Feb | 300   | 101  | 100  | 99   | 1 |
| Project C | 2022-02-11 | 22-Feb | 284   | 138  | 137  | 135  | 1 |
| Project C | 2022-02-13 | 22-Feb | 213   | 100  | 99   | 98   | 1 |

|           |            |        |     |     |     |     |   |
|-----------|------------|--------|-----|-----|-----|-----|---|
| Project C | 2022-02-09 | 22-Feb | 299 | 151 | 150 | 150 | 1 |
| Project C | 2022-02-28 | 22-Feb | 252 | 146 | 145 | 141 | 1 |
| Project C | 2022-02-20 | 22-Feb | 213 | 126 | 125 | 125 | 1 |
| Project C | 2022-04-12 | Apr-22 | 294 | 127 | 126 | 119 | 1 |
| Project C | 2022-04-17 | Apr-22 | 307 | 118 | 117 | 116 | 1 |
| Project C | 2022-04-01 | Apr-22 | 219 | 134 | 133 | 131 | 1 |
| Project C | 2022-04-26 | Apr-22 | 294 | 164 | 163 | 163 | 1 |
| Project C | 2022-04-29 | Apr-22 | 219 | 137 | 136 | 132 | 1 |
| Project C | 2022-04-19 | Apr-22 | 294 | 123 | 122 | 122 | 1 |
| Project C | 2022-04-22 | Apr-22 | 219 | 103 | 102 | 99  | 1 |
| Project C | 2022-04-23 | Apr-22 | 259 | 131 | 131 | 128 | 0 |
| Project C | 2022-04-24 | Apr-22 | 307 | 125 | 125 | 125 | 0 |
| Project C | 2022-04-25 | Apr-22 | 307 | 113 | 113 | 111 | 0 |
| Project C | 2022-04-20 | Apr-22 | 291 | 134 | 134 | 132 | 0 |
| Project C | 2022-04-21 | Apr-22 | 288 | 113 | 113 | 110 | 0 |
| Project C | 2022-04-03 | Apr-22 | 308 | 125 | 125 | 122 | 0 |
| Project C | 2022-04-18 | Apr-22 | 307 | 111 | 111 | 111 | 0 |
| Project C | 2022-04-15 | Apr-22 | 219 | 84  | 84  | 83  | 0 |
| Project C | 2022-04-11 | Apr-22 | 307 | 96  | 96  | 92  | 0 |
| Project C | 2022-02-21 | 22-Feb | 252 | 137 | 137 | 137 | 0 |
| Project C | 2022-02-23 | 22-Feb | 299 | 147 | 147 | 147 | 0 |
| Project C | 2022-02-24 | 22-Feb | 288 | 127 | 127 | 127 | 0 |
| Project C | 2022-02-17 | 22-Feb | 288 | 121 | 121 | 121 | 0 |
| Project C | 2022-02-18 | 22-Feb | 284 | 133 | 133 | 133 | 0 |

|           |            |        |     |     |     |     |   |
|-----------|------------|--------|-----|-----|-----|-----|---|
| Project C | 2022-02-14 | 22-Feb | 252 | 111 | 111 | 111 | 0 |
| Project C | 2022-02-12 | 22-Feb | 281 | 114 | 114 | 112 | 0 |
| Project C | 2022-02-05 | 22-Feb | 281 | 168 | 168 | 164 | 0 |

## 6. Total Forecasted Calls & Total Offered Calls for the month of February

In [14]: %%sql

```
SELECT
    SUM(Forecasted_Calls) AS Total_Forecasted_Calls,
    SUM(Calls_Offered) AS Total_Offered_Calls
FROM CallCenter_Feb;
```

\* mssql+pyodbc://@DESKTOP-0F81S6G/SallaProject?driver=ODBC+Driver+17+for+SQL+Server&trusted\_connection=yes  
Done.

Out[14]: **Total\_Forecasted\_Calls    Total\_Offered\_Calls**

|        |        |
|--------|--------|
| 704490 | 446217 |
|--------|--------|

## Q7: Call Handling Rate per Agent

In [15]: %%sql

```
SELECT
    Agent_Name,
    CAST(
        (CAST(SUM(Calls_Handled) AS DECIMAL(10,2)) * 100.0) / CAST(SUM(Calls_Offered) AS DECIMAL(10,2))
    AS DECIMAL(10,2))
AS Handling_Rate
FROM All_Months
GROUP BY Agent_Name;
```

\* mssql+pyodbc://@DESKTOP-0F81S6G/SallaProject?driver=ODBC+Driver+17+for+SQL+Server&trusted\_connection=yes  
Done.

Out[15]:

| Agent_Name | Handling_Rate |
|------------|---------------|
| Ahmed      | 99.47         |
| Ali        | 99.50         |
| Dina       | 97.41         |
| Fatma      | 98.22         |
| Hassan     | 99.34         |
| Huda       | 97.03         |
| Khaled     | 99.41         |
| Laila      | 99.66         |
| Mona       | 99.43         |
| Nour       | 98.44         |
| Omar       | 99.38         |
| Rania      | 98.01         |
| Samir      | 99.62         |
| Sara       | 99.61         |
| Tariq      | 98.93         |
| Youssef    | 97.25         |

## Q8: ASA Classification (Using CASE)

In [16]:

```
%%sql

SELECT
    Date,
    CAST(ASA AS DECIMAL(10,2)) AS ASA,
    CASE
        WHEN CAST(ASA AS DECIMAL(10,2)) < 5 THEN 'Excellent'
        WHEN CAST(ASA AS DECIMAL(10,2)) BETWEEN 5 AND 10 THEN 'Good'
        ELSE 'Poor'
    END AS ASA_Status
FROM All_Months;
```

\* mssql+pyodbc://@DESKTOP-0F81S6G/SallaProject?driver=ODBC+Driver+17+for+SQL+Server&trusted\_connection=yes  
Done.

Out[16]:

| Date       | ASA   | ASA_Status |
|------------|-------|------------|
| 2022-02-01 | 1.69  | Excellent  |
| 2022-02-02 | 2.34  | Excellent  |
| 2022-02-03 | 1.87  | Excellent  |
| 2022-02-04 | 51.21 | Poor       |
| 2022-02-05 | 7.24  | Good       |
| 2022-02-06 | 8.04  | Good       |
| 2022-02-07 | 2.79  | Excellent  |
| 2022-02-08 | 2.88  | Excellent  |
| 2022-02-09 | 1.68  | Excellent  |
| 2022-02-10 | 1.72  | Excellent  |
| 2022-02-11 | 1.73  | Excellent  |
| 2022-02-12 | 1.70  | Excellent  |
| 2022-02-13 | 2.19  | Excellent  |
| 2022-02-14 | 1.68  | Excellent  |
| 2022-02-15 | 1.73  | Excellent  |
| 2022-02-16 | 1.85  | Excellent  |
| 2022-02-17 | 1.69  | Excellent  |
| 2022-02-18 | 1.69  | Excellent  |
| 2022-02-19 | 6.80  | Good       |
| 2022-02-20 | 2.00  | Excellent  |
| 2022-02-21 | 1.68  | Excellent  |
| 2022-02-22 | 1.68  | Excellent  |
| 2022-02-23 | 1.69  | Excellent  |
| 2022-02-24 | 1.69  | Excellent  |
| 2022-02-25 | 1.79  | Excellent  |
| 2022-02-26 | 49.68 | Poor       |
| 2022-02-27 | 13.53 | Poor       |
| 2022-02-28 | 2.93  | Excellent  |
| 2022-02-01 | 1.68  | Excellent  |
| 2022-02-02 | 2.40  | Excellent  |
| 2022-02-03 | 1.88  | Excellent  |
| 2022-02-04 | 51.92 | Poor       |
| 2022-02-05 | 7.31  | Good       |
| 2022-02-06 | 7.83  | Good       |
| 2022-02-07 | 2.75  | Excellent  |
| 2022-02-08 | 2.88  | Excellent  |
| 2022-02-09 | 1.69  | Excellent  |
| 2022-02-10 | 1.73  | Excellent  |

|            |       |           |
|------------|-------|-----------|
| 2022-02-11 | 1.69  | Excellent |
| 2022-02-12 | 1.68  | Excellent |
| 2022-02-13 | 2.16  | Excellent |
| 2022-02-14 | 1.68  | Excellent |
| 2022-02-15 | 1.72  | Excellent |
| 2022-02-16 | 1.85  | Excellent |
| 2022-02-17 | 1.68  | Excellent |
| 2022-02-18 | 1.69  | Excellent |
| 2022-02-19 | 6.69  | Good      |
| 2022-02-20 | 2.01  | Excellent |
| 2022-02-21 | 1.68  | Excellent |
| 2022-02-22 | 1.68  | Excellent |
| 2022-02-23 | 1.69  | Excellent |
| 2022-02-24 | 1.69  | Excellent |
| 2022-02-25 | 1.80  | Excellent |
| 2022-02-26 | 50.34 | Poor      |
| 2022-02-27 | 13.33 | Poor      |
| 2022-02-28 | 2.96  | Excellent |
| 2022-02-01 | 2.13  | Excellent |
| 2022-02-02 | 2.95  | Excellent |
| 2022-02-03 | 1.67  | Excellent |
| 2022-02-04 | 17.59 | Poor      |
| 2022-02-05 | 3.54  | Excellent |
| 2022-02-06 | 11.20 | Poor      |
| 2022-02-07 | 3.57  | Excellent |
| 2022-02-08 | 1.71  | Excellent |
| 2022-02-09 | 1.68  | Excellent |
| 2022-02-10 | 1.58  | Excellent |
| 2022-02-11 | 3.09  | Excellent |
| 2022-02-12 | 3.01  | Excellent |
| 2022-02-13 | 2.52  | Excellent |
| 2022-02-14 | 1.72  | Excellent |
| 2022-02-15 | 1.63  | Excellent |
| 2022-02-16 | 2.08  | Excellent |
| 2022-02-17 | 1.67  | Excellent |
| 2022-02-18 | 1.76  | Excellent |
| 2022-02-19 | 7.48  | Good      |
| 2022-02-20 | 1.83  | Excellent |
| 2022-02-21 | 1.72  | Excellent |

|            |        |           |
|------------|--------|-----------|
| 2022-02-22 | 1.64   | Excellent |
| 2022-02-23 | 1.69   | Excellent |
| 2022-02-24 | 1.62   | Excellent |
| 2022-02-25 | 1.67   | Excellent |
| 2022-02-26 | 35.63  | Poor      |
| 2022-02-27 | 4.34   | Excellent |
| 2022-02-28 | 3.82   | Excellent |
| 2022-03-01 | 17.83  | Poor      |
| 2022-03-02 | 65.17  | Poor      |
| 2022-03-03 | 76.14  | Poor      |
| 2022-03-04 | 92.36  | Poor      |
| 2022-03-05 | 102.79 | Poor      |
| 2022-03-06 | 67.76  | Poor      |
| 2022-03-07 | 6.54   | Good      |
| 2022-03-08 | 3.32   | Excellent |
| 2022-03-09 | 4.06   | Excellent |
| 2022-03-10 | 17.34  | Poor      |
| 2022-03-11 | 6.94   | Good      |
| 2022-03-12 | 2.13   | Excellent |
| 2022-03-13 | 2.00   | Excellent |
| 2022-03-14 | 1.76   | Excellent |
| 2022-03-15 | 1.87   | Excellent |
| 2022-03-16 | 1.87   | Excellent |
| 2022-03-17 | 2.02   | Excellent |
| 2022-03-18 | 1.95   | Excellent |
| 2022-03-19 | 1.80   | Excellent |
| 2022-03-20 | 1.95   | Excellent |
| 2022-03-21 | 1.88   | Excellent |
| 2022-03-22 | 1.94   | Excellent |
| 2022-03-23 | 1.88   | Excellent |
| 2022-03-24 | 18.47  | Poor      |
| 2022-03-25 | 2.49   | Excellent |
| 2022-03-26 | 1.82   | Excellent |
| 2022-03-27 | 4.86   | Excellent |
| 2022-03-28 | 2.57   | Excellent |
| 2022-03-29 | 2.00   | Excellent |
| 2022-03-30 | 1.75   | Excellent |
| 2022-03-31 | 1.91   | Excellent |
| 2022-03-01 | 16.39  | Poor      |

|            |        |           |
|------------|--------|-----------|
| 2022-03-02 | 68.29  | Poor      |
| 2022-03-03 | 79.14  | Poor      |
| 2022-03-04 | 103.45 | Poor      |
| 2022-03-05 | 180.90 | Poor      |
| 2022-03-06 | 89.54  | Poor      |
| 2022-03-07 | 7.08   | Good      |
| 2022-03-08 | 3.34   | Excellent |
| 2022-03-09 | 5.19   | Good      |
| 2022-03-10 | 27.29  | Poor      |
| 2022-03-11 | 6.40   | Good      |
| 2022-03-12 | 2.12   | Excellent |
| 2022-03-13 | 1.93   | Excellent |
| 2022-03-14 | 1.77   | Excellent |
| 2022-03-15 | 1.94   | Excellent |
| 2022-03-16 | 1.89   | Excellent |
| 2022-03-17 | 2.04   | Excellent |
| 2022-03-18 | 2.43   | Excellent |
| 2022-03-19 | 1.85   | Excellent |
| 2022-03-20 | 1.97   | Excellent |
| 2022-03-21 | 2.11   | Excellent |
| 2022-03-22 | 2.02   | Excellent |
| 2022-03-23 | 1.99   | Excellent |
| 2022-03-24 | 25.41  | Poor      |
| 2022-03-25 | 2.48   | Excellent |
| 2022-03-26 | 1.89   | Excellent |
| 2022-03-27 | 5.09   | Good      |
| 2022-03-28 | 3.09   | Excellent |
| 2022-03-29 | 2.13   | Excellent |
| 2022-03-30 | 1.79   | Excellent |
| 2022-03-31 | 1.96   | Excellent |
| 2022-03-01 | 6.17   | Good      |
| 2022-03-02 | 11.66  | Poor      |
| 2022-03-03 | 10.72  | Poor      |
| 2022-03-04 | 19.26  | Poor      |
| 2022-03-05 | 12.27  | Poor      |
| 2022-03-06 | 2.84   | Excellent |
| 2022-03-07 | 6.82   | Good      |
| 2022-03-08 | 8.55   | Good      |
| 2022-03-09 | 4.34   | Excellent |

|            |       |           |
|------------|-------|-----------|
| 2022-03-10 | 10.92 | Poor      |
| 2022-03-11 | 4.07  | Excellent |
| 2022-03-12 | 10.11 | Poor      |
| 2022-03-13 | 2.89  | Excellent |
| 2022-03-14 | 2.72  | Excellent |
| 2022-03-15 | 2.52  | Excellent |
| 2022-03-16 | 2.73  | Excellent |
| 2022-03-17 | 2.98  | Excellent |
| 2022-03-18 | 6.45  | Good      |
| 2022-03-19 | 5.27  | Good      |
| 2022-03-20 | 1.77  | Excellent |
| 2022-03-21 | 2.27  | Excellent |
| 2022-03-22 | 2.60  | Excellent |
| 2022-03-23 | 2.08  | Excellent |
| 2022-03-24 | 2.90  | Excellent |
| 2022-03-25 | 7.09  | Good      |
| 2022-03-26 | 3.30  | Excellent |
| 2022-03-27 | 2.55  | Excellent |
| 2022-03-28 | 1.76  | Excellent |
| 2022-03-29 | 2.13  | Excellent |
| 2022-03-30 | 2.55  | Excellent |
| 2022-03-31 | 3.23  | Excellent |
| 2022-04-01 | 1.76  | Excellent |
| 2022-04-02 | 2.05  | Excellent |
| 2022-04-03 | 2.45  | Excellent |
| 2022-04-04 | 2.94  | Excellent |
| 2022-04-05 | 11.69 | Poor      |
| 2022-04-06 | 10.94 | Poor      |
| 2022-04-07 | 36.48 | Poor      |
| 2022-04-08 | 6.50  | Good      |
| 2022-04-09 | 5.73  | Good      |
| 2022-04-10 | 3.65  | Excellent |
| 2022-04-11 | 3.30  | Excellent |
| 2022-04-12 | 2.83  | Excellent |
| 2022-04-13 | 3.18  | Excellent |
| 2022-04-14 | 3.09  | Excellent |
| 2022-04-15 | 2.50  | Excellent |
| 2022-04-16 | 4.27  | Excellent |
| 2022-04-17 | 1.99  | Excellent |

|            |       |           |
|------------|-------|-----------|
| 2022-04-18 | 2.03  | Excellent |
| 2022-04-19 | 2.02  | Excellent |
| 2022-04-20 | 1.97  | Excellent |
| 2022-04-21 | 10.10 | Poor      |
| 2022-04-22 | 1.83  | Excellent |
| 2022-04-23 | 1.75  | Excellent |
| 2022-04-24 | 1.69  | Excellent |
| 2022-04-25 | 1.97  | Excellent |
| 2022-04-26 | 3.07  | Excellent |
| 2022-04-27 | 21.49 | Poor      |
| 2022-04-28 | 21.30 | Poor      |
| 2022-04-29 | 26.35 | Poor      |
| 2022-04-30 | 3.09  | Excellent |
| 2022-04-01 | 1.74  | Excellent |
| 2022-04-02 | 1.93  | Excellent |
| 2022-04-03 | 2.49  | Excellent |
| 2022-04-04 | 3.09  | Excellent |
| 2022-04-05 | 11.63 | Poor      |
| 2022-04-06 | 11.37 | Poor      |
| 2022-04-07 | 37.52 | Poor      |
| 2022-04-08 | 5.75  | Good      |
| 2022-04-09 | 5.12  | Good      |
| 2022-04-10 | 3.67  | Excellent |
| 2022-04-11 | 3.40  | Excellent |
| 2022-04-12 | 2.74  | Excellent |
| 2022-04-13 | 3.22  | Excellent |
| 2022-04-14 | 3.16  | Excellent |
| 2022-04-15 | 2.55  | Excellent |
| 2022-04-16 | 4.29  | Excellent |
| 2022-04-17 | 2.05  | Excellent |
| 2022-04-18 | 2.10  | Excellent |
| 2022-04-19 | 2.09  | Excellent |
| 2022-04-20 | 2.00  | Excellent |
| 2022-04-21 | 10.07 | Poor      |
| 2022-04-22 | 1.74  | Excellent |
| 2022-04-23 | 1.69  | Excellent |
| 2022-04-24 | 1.69  | Excellent |
| 2022-04-25 | 1.98  | Excellent |
| 2022-04-26 | 3.10  | Excellent |

|            |       |           |
|------------|-------|-----------|
| 2022-04-27 | 21.12 | Poor      |
| 2022-04-28 | 21.20 | Poor      |
| 2022-04-29 | 26.98 | Poor      |
| 2022-04-30 | 2.99  | Excellent |
| 2022-04-01 | 2.58  | Excellent |
| 2022-04-02 | 11.21 | Poor      |
| 2022-04-03 | 3.57  | Excellent |
| 2022-04-04 | 2.05  | Excellent |
| 2022-04-05 | 24.34 | Poor      |
| 2022-04-06 | 7.79  | Good      |
| 2022-04-07 | 15.02 | Poor      |
| 2022-04-08 | 32.16 | Poor      |
| 2022-04-09 | 36.92 | Poor      |
| 2022-04-10 | 8.52  | Good      |
| 2022-04-11 | 4.48  | Excellent |
| 2022-04-12 | 7.37  | Good      |
| 2022-04-13 | 2.42  | Excellent |
| 2022-04-14 | 3.41  | Excellent |
| 2022-04-15 | 3.00  | Excellent |
| 2022-04-16 | 3.02  | Excellent |
| 2022-04-17 | 2.31  | Excellent |
| 2022-04-18 | 1.61  | Excellent |
| 2022-04-19 | 1.66  | Excellent |
| 2022-04-20 | 2.81  | Excellent |
| 2022-04-21 | 4.04  | Excellent |
| 2022-04-22 | 6.37  | Good      |
| 2022-04-23 | 4.05  | Excellent |
| 2022-04-24 | 1.62  | Excellent |
| 2022-04-25 | 2.98  | Excellent |
| 2022-04-26 | 1.88  | Excellent |
| 2022-04-27 | 8.41  | Good      |
| 2022-04-28 | 7.43  | Good      |
| 2022-04-29 | 4.43  | Excellent |
| 2022-04-30 | 8.63  | Good      |

## Q9: Above Average Abandoned Calls

In [17]: `%%sql`

```
SELECT *
FROM All_Months
```

```
WHERE Calls_Abandon >  
(  
  SELECT AVG(Calls_Abandon)  
  FROM All_Months  
);
```

\* mssql+pyodbc://@DESKTOP-0F81S6G/SallaProject?driver=ODBC+Driver+17+for+SQL+Server&trusted\_connection=yes  
Done.

| Out[17]: | Project   | Date       | Month  | Forecasted_Calls | Calls_Offered | Calls_Handled | Calls_Handled_With_in_Threshold | Calls_Abandon |   |
|----------|-----------|------------|--------|------------------|---------------|---------------|---------------------------------|---------------|---|
|          | Project A | 2022-02-04 | 22-Feb | 13002            | 10883         | 10614         | 7376                            | 269           |   |
|          | Project A | 2022-02-26 | 22-Feb | 12758            | 13437         | 12994         | 7440                            | 443           |   |
|          | Project B | 2022-02-04 | 22-Feb | 12718            | 8843          | 8635          | 5974                            | 208           |   |
|          | Project B | 2022-02-26 | 22-Feb | 12477            | 11418         | 11046         | 6252                            | 372           |   |
|          | Project A | 2022-03-01 | Mar-22 | 13389            | 11747         | 11596         | 9291                            | 151           |   |
|          | Project A | 2022-03-02 | Mar-22 | 13134            | 14735         | 14092         | 7895                            | 643           |   |
|          | Project A | 2022-03-03 | Mar-22 | 12545            | 13946         | 13256         | 5411                            | 690           |   |
|          | Project A | 2022-03-04 | Mar-22 | 9970             | 11663         | 10884         | 7211                            | 779           |   |
|          | Project A | 2022-03-05 | Mar-22 | 12209            | 14504         | 13476         | 6228                            | 1028          | 1 |
|          | Project A | 2022-03-06 | Mar-22 | 13843            | 15328         | 14652         | 9230                            | 676           |   |
|          | Project A | 2022-03-07 | Mar-22 | 13585            | 16324         | 16223         | 15445                           | 101           |   |
|          | Project A | 2022-03-10 | Mar-22 | 12545            | 10402         | 10275         | 9585                            | 127           |   |
|          | Project A | 2022-03-24 | Mar-22 | 12545            | 10378         | 10197         | 8564                            | 181           |   |
|          | Project B | 2022-03-01 | Mar-22 | 17117            | 18438         | 18071         | 14792                           | 367           |   |
|          | Project B | 2022-03-02 | Mar-22 | 16778            | 19001         | 17785         | 10398                           | 1216          |   |
|          | Project B | 2022-03-03 | Mar-22 | 16064            | 18290         | 16900         | 6847                            | 1390          |   |
|          | Project B | 2022-03-04 | Mar-22 | 12818            | 15270         | 13785         | 8615                            | 1485          | 1 |
|          | Project B | 2022-03-05 | Mar-22 | 15654            | 17965         | 14864         | 5868                            | 3101          | 1 |
|          | Project B | 2022-03-06 | Mar-22 | 17684            | 21739         | 19805         | 11749                           | 1934          |   |
|          | Project B | 2022-03-07 | Mar-22 | 17370            | 17701         | 17475         | 16504                           | 226           |   |
|          | Project B | 2022-03-08 | Mar-22 | 17117            | 16261         | 16118         | 15893                           | 143           |   |
|          | Project B | 2022-03-09 | Mar-22 | 16778            | 15106         | 14952         | 14350                           | 154           |   |
|          | Project B | 2022-03-10 | Mar-22 | 16064            | 17374         | 16909         | 15521                           | 465           |   |
|          | Project B | 2022-03-11 | Mar-22 | 12818            | 13395         | 13260         | 12637                           | 135           |   |

|  |           |            |        |       |       |       |       |     |
|--|-----------|------------|--------|-------|-------|-------|-------|-----|
|  | Project B | 2022-03-12 | Mar-22 | 15655 | 15160 | 15072 | 15006 | 88  |
|  | Project B | 2022-03-13 | Mar-22 | 17685 | 14825 | 14725 | 14702 | 100 |
|  | Project B | 2022-03-14 | Mar-22 | 17370 | 14415 | 14326 | 14326 | 89  |
|  | Project B | 2022-03-16 | Mar-22 | 16778 | 14304 | 14211 | 14204 | 93  |
|  | Project B | 2022-03-17 | Mar-22 | 16064 | 13611 | 13494 | 13462 | 117 |
|  | Project B | 2022-03-18 | Mar-22 | 12818 | 14427 | 14319 | 14155 | 108 |
|  | Project B | 2022-03-19 | Mar-22 | 15655 | 14008 | 13908 | 13880 | 100 |
|  | Project B | 2022-03-20 | Mar-22 | 17685 | 15677 | 15573 | 15556 | 104 |
|  | Project B | 2022-03-21 | Mar-22 | 17370 | 16320 | 16229 | 16177 | 91  |
|  | Project B | 2022-03-22 | Mar-22 | 17117 | 14294 | 14202 | 14190 | 92  |
|  | Project B | 2022-03-24 | Mar-22 | 16064 | 30381 | 29630 | 22741 | 751 |
|  | Project B | 2022-03-25 | Mar-22 | 12818 | 15592 | 15501 | 15358 | 91  |
|  | Project B | 2022-03-26 | Mar-22 | 15655 | 13821 | 13732 | 13716 | 89  |
|  | Project B | 2022-03-27 | Mar-22 | 17685 | 18343 | 18200 | 17873 | 143 |
|  | Project B | 2022-03-28 | Mar-22 | 17370 | 18046 | 17926 | 17727 | 120 |
|  | Project B | 2022-03-30 | Mar-22 | 16778 | 16005 | 15914 | 15904 | 91  |
|  | Project B | 2022-03-31 | Mar-22 | 16064 | 16001 | 15910 | 15907 | 91  |
|  | Project A | 2022-04-07 | Apr-22 | 12847 | 11176 | 10939 | 9383  | 237 |
|  | Project A | 2022-04-27 | Apr-22 | 13093 | 10756 | 10579 | 9435  | 177 |
|  | Project A | 2022-04-28 | Apr-22 | 12847 | 9891  | 9757  | 8284  | 134 |
|  | Project A | 2022-04-29 | Apr-22 | 10496 | 8428  | 8294  | 6923  | 134 |
|  | Project B | 2022-04-07 | Apr-22 | 12559 | 9319  | 9130  | 7802  | 189 |
|  | Project B | 2022-04-27 | Apr-22 | 12802 | 8869  | 8734  | 7807  | 135 |
|  | Project B | 2022-04-28 | Apr-22 | 12559 | 8167  | 8066  | 6859  | 101 |

## Q10: Create View for Handled & Abandoned Calls per Agent

```
In [20]: %%sql

CREATE VIEW AgentCall_Summary AS

SELECT Agent_Name,
        SUM(Calls_Handled) AS Total_HandledCalls,
        SUM(Calls_Abandon) AS Total_AbandonedCalls
FROM All_Months
GROUP BY Agent_Name;
```

\* mssql+pyodbc://@DESKTOP-0F81S6G/SallaProject?driver=ODBC+Driver+17+for+SQL+Server&trusted\_connection=yes  
Done.

Out[20]: []

## View AgentCall\_Summary

```
In [21]: %%sql

SELECT * FROM AgentCall_Summary;
```

\* mssql+pyodbc://@DESKTOP-0F81S6G/SallaProject?driver=ODBC+Driver+17+for+SQL+Server&trusted\_connection=yes  
Done.

Out[21]:

| Agent_Name | Total_HandledCalls | Total_AbandonedCalls |
|------------|--------------------|----------------------|
| Ahmed      | 74962              | 403                  |
| Ali        | 148844             | 741                  |
| Dina       | 171785             | 4565                 |
| Fatma      | 91208              | 1655                 |
| Hassan     | 59649              | 396                  |
| Huda       | 149952             | 4582                 |
| Khaled     | 121234             | 721                  |
| Laila      | 54180              | 185                  |
| Mona       | 120095             | 684                  |
| Nour       | 34054              | 541                  |
| Omar       | 89674              | 558                  |
| Rania      | 142639             | 2899                 |
| Samir      | 141668             | 544                  |
| Sara       | 73427              | 291                  |
| Tariq      | 157377             | 1703                 |
| Youssef    | 91094              | 2575                 |