**Introduction**

Finmax Bank is a reputed national bank (fictional) with a large customer base and generous funding. It operates multiple call centres throughout the country to handle various customer transactions, loans, deposits and claims. However, the bank has been experiencing slower growth in recent times. They are finding it difficult to acquire new customers and retain the existing ones. Since around 90% of their business comes from existing customers, it is important to retain them. Hence, in response, Finmax Bank is prioritising customer satisfaction.

As a consultant for Finmax Bank, you have been tasked with analysing call record data to assess the performance of their call centres and identify ways to improve customer satisfaction. The data provided consists of a random sample of 1,000 call records from a particular week. This represents a fraction of the total volume of approximately 5,00,000 calls per week across all call centres.

With this data at your disposal, you can help Finmax Bank gain valuable insights into the performance of their call centres. By analysing key metrics like call duration, wait times, call resolution rates and customer feedback, you can provide a detailed assessment of how well the call centres are performing. Additionally, you can identify trends and patterns in the data to identify areas that need improvement and recommend strategies to improve customer satisfaction.

Use the dataset named ‘**Call\_Center\_CSAT\_Data**’ for this case study.

The data description is given in the table below.

|  |  |
| --- | --- |
| **Parameter** | **Description** |
| CallId | It represents a unique identifier for each call made to a customer service centre. |
| CallDuration | It represents the duration of each call in minutes. |
| CallTransfer | This is a binary variable with a value of 0 or 1, where 1 indicates that the call was initially connected to an agent but later transferred to another agent, and 0 indicates that you only talked to one agent throughout the call. |
| CSAT | This is the customer satisfaction score on a 6-point scale of 0–5. A higher score indicates higher satisfaction. It is usually calculated based on a customer survey or feedback. |

**Note:** Assume that the conditions for **Central Limit Theorem (CLT)** are valid for the given dataset.

## **Deliverables**

You are required to work on an Excel file with all the calculations for each task in separate tabs. Mention your recommendations for each task in their respective tabs. You can refer to the starter file named ‘**Call\_Center\_CSAT\_Data*\_*Sample\_Solution\_Format**’.

## **Tasks**

We have broken down this case study into the following tasks:

**Task 1**

Perform exploratory analysis of the data provided and find the following:

a. Calculate the mean and standard deviation for the CSAT score.

b. Calculate the mean ‘CallDuration’ grouped by CSAT score. What can you interpret about the relationship between ‘CallDuration’ and CSAT score? What would be your recommendation to the bank based on this?

**Task 2**

Using the data provided, estimate the range for the mean CSAT rating of the population, assuming a 95% confidence interval. Industry benchmarks indicate that an average CSAT of 3.5 is considered ideal for call centre operations. Based on the estimated range for the mean CSAT rating, do we have enough confidence to say that our CSAT is above the benchmark of 3.5?

**Task 3**

An alternate version of the industry benchmark is that at least 50% of the customers should give a rating of 4 and above. From the data, do we have enough confidence to say that we meet this industry benchmark? Assume a 95% confidence interval.

**Hint:** Create a new variable called ‘PropCSAT’, which is 1 if the score is 4 and above, and 0 in all other scenarios. Find the range for this variable.

**Note:** For this task, we are classifying the data into two groups using the ‘PropCSAT’ variable to find the proportion of customers who give a rating of 4 or above. Hence, we will be calculating a sample proportion and standard error of proportion here instead of the mean and **Standard Error of Mean (SEM)**.

The formulae for these are given below:

* Sample proportion:
* Standard error of proportion:

where,

**:** : Sample proportion

**x:** The count of data points in the sample with the desired characteristics

**n:** The total number of data points in the sample

**Task 4**

Finmax Bank wants to figure out a path for improving CSAT, and they believe that reducing call transfers and addressing customer issues through minimal transfers can help improve CSAT scores. How will you analyse this, and what would be your suggestion? Assume a 95% confidence interval.

**Hint:** Find the confidence interval for the CSAT score with and without call transfer. Use the same approach as the one in Task 2 to find this.

**Task 5**

It was mentioned previously, in the problem statement, that the conditions for CLT hold true for this dataset. The following are the essential conditions for this case study:

* Random sampling
* Independent and identical distribution
* Large sample size

Explain each of these conditions and at least one case each when they fail.