ABC Call Volume Trend Analysis

Tech Used: - Microsoft Excel

Analysis done on the following points: -

A. Calculate the average call time duration for all incoming calls received by agents (in each Time_Bucket).

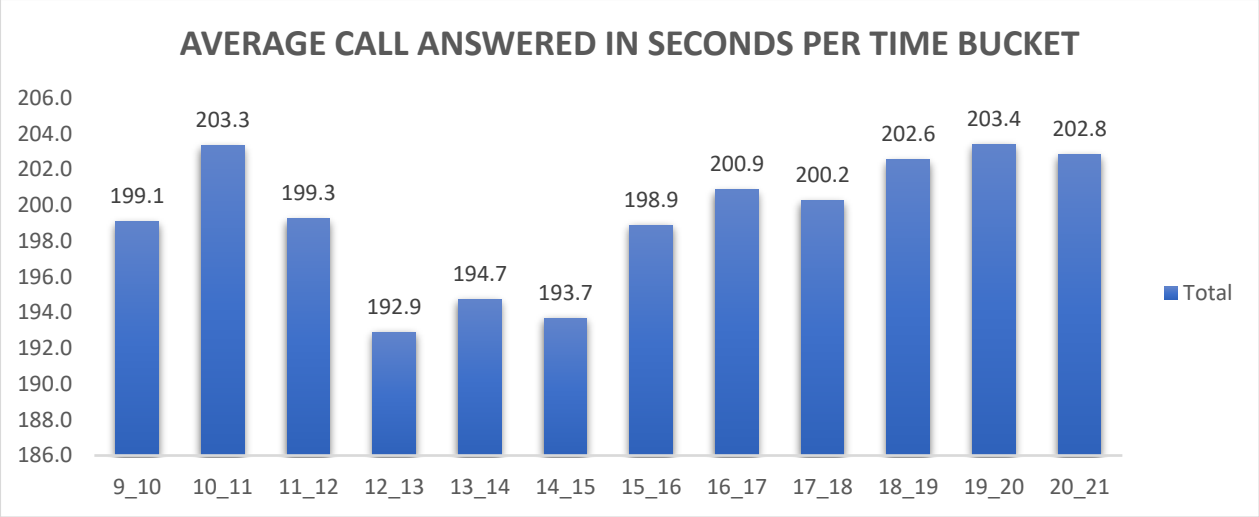
B. Show the total volume/ number of calls coming in via charts/ graphs [Number of calls v/s Time]. You can select time in a bucket form (i.e., 1-2, 2-3, ….)

C. As you can see current abandon rate is approximately 30%. Propose a manpower plan required during each time bucket [between 9am to 9pm] to reduce the abandon rate to 10%. (i.e., You have to calculate minimum number of agents required in each time bucket so that at least 90 calls should be answered out of 100.)

D. Let's say customers also call this ABC insurance company in night but didn't get answer as there are no agents to answer, this creates a bad customer experience for this Insurance company. Suppose every 100 calls that customer made during 9 Am to 9 Pm, customer also made 30 calls in night between interval [9 Pm to 9 Am]. Now propose a manpower plan required during each time bucket in a day. Maximum Abandon rate assumption would be same 10%.

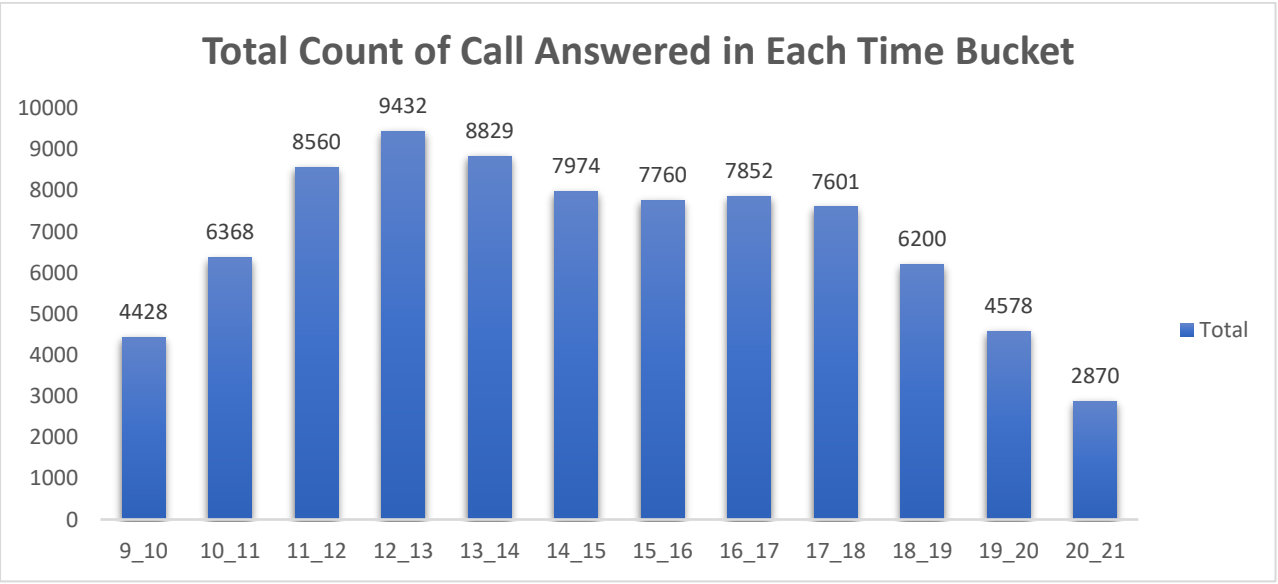
Assumption: An agent work for 6 days a week; On an average total unplanned leaves per agent is 4 days a month; An agent total working hrs is 9 Hrs out of which 1.5 Hrs goes into lunch and snacks in the office. On average an agent occupied for 60% of his total actual working Hrs (i.e 60% of 7.5 Hrs) on call with customers/ users. Total days in a month is 30 days.

The cleaned and analyzed data in the form of excel sheets have been uploaded to Google Drive also the excel sheets are large files due to vastness of data, so they won't be visible on google excel sheets online they need to be downloaded and seen offline using Microsoft Excel 2019.



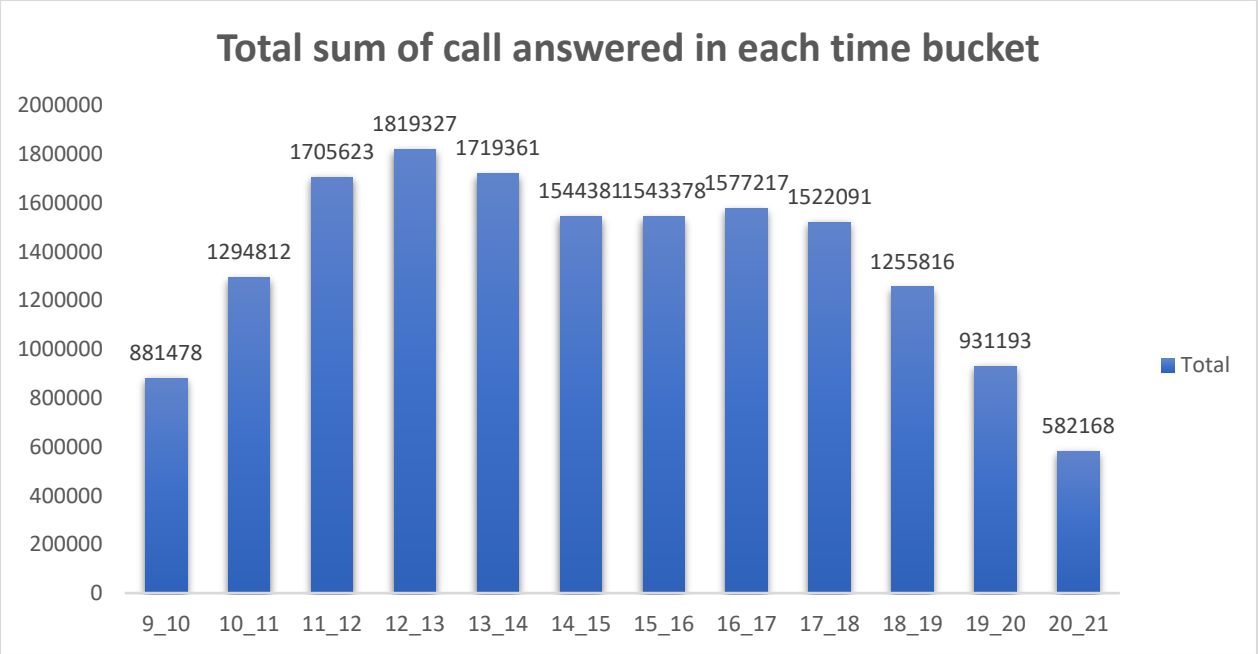
Call_Status	answered
Row Labels	**Average of Call_Seconds (s)**
9_10	199.1
10_11	203.3
11_12	199.3
12_13	192.9
13_14	194.7
14_15	193.7
15_16	198.9
16_17	200.9
17_18	200.2
18_19	202.6
19_20	203.4
20_21	202.8
Grand Total	**198.6**

From the above bar plot, we can infer that time_bucket 19_20 i.e., 7PM to 8PM had the highest of average of calls answered in seconds i.e., 203.4.



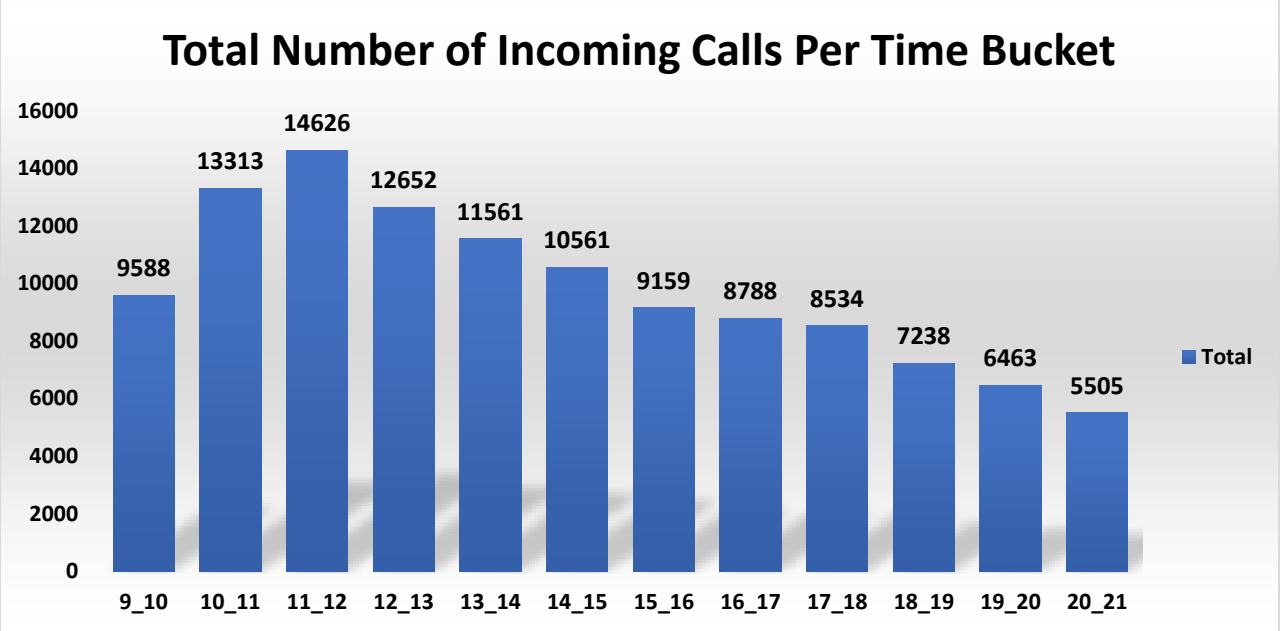
Call_Status	answered
Row Labels	**Count of Call_Seconds (s)**
9_10	4428
10_11	6368
11_12	8560
12_13	9432
13_14	8829
14_15	7974
15_16	7760
16_17	7852
17_18	7601
18_19	6200
19_20	4578
20_21	2870
Grand Total	**82452**

From the above bar plot we can infer that the time_bucket 12-13 i.e. 12PM to 1PM had the highest count of calls answered i.e. 9432



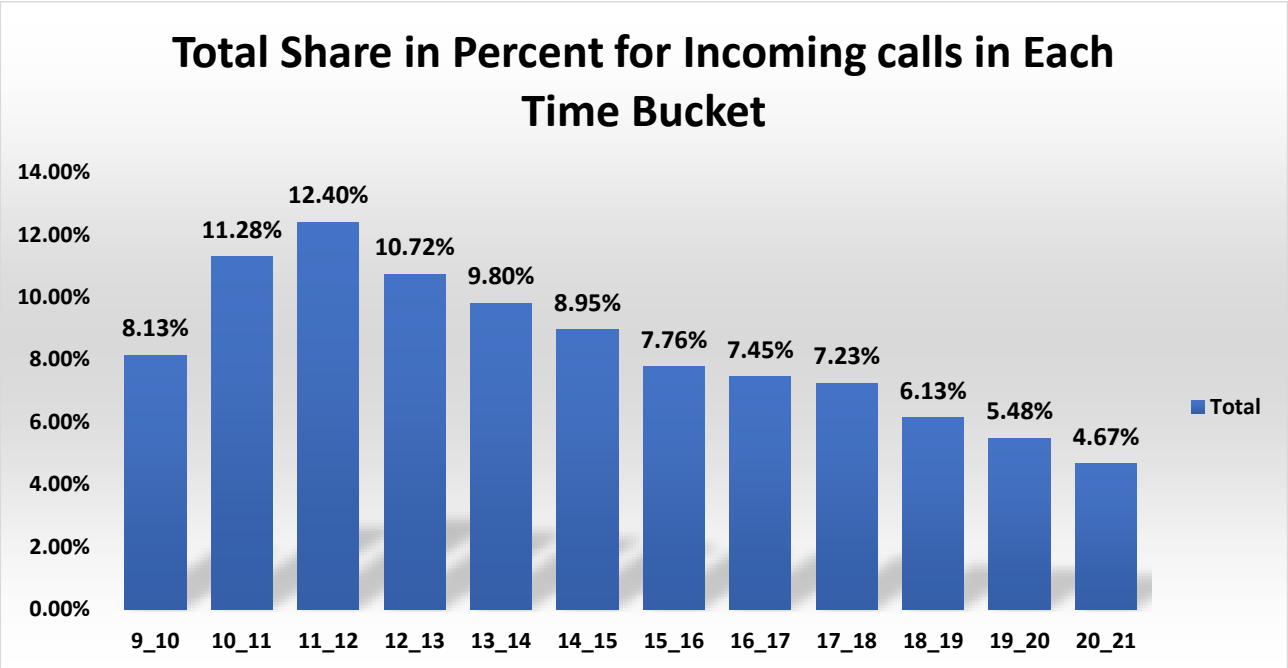
Call_Status	answered
Row Labels	**Sum of Call_Seconds (s)**
9_10	881478
10_11	1294812
11_12	1705623
12_13	1819327
13_14	1719361
14_15	1544381
15_16	1543378
16_17	1577217
17_18	1522091
18_19	1255816
19_20	931193
20_21	582168
Grand Total	**16376845**

From the above Bar plot, we can infer that the time_bucket 12_13 i.e., during the time period 12PM to 1PM had the highest total number of calls answered i.e., 1819327



Row Labels	Count of Customer_Phone_No
9_10	9588
10_11	13313
11_12	14626
12_13	12652
13_14	11561
14_15	10561
15_16	9159
16_17	8788
17_18	8534
18_19	7238
19_20	6463
20_21	5505
Grand Total	**117988**

From the above bar plot, we can infer that time bucket 11_12 i.e., 11AM to 12PM has the highest count for total number incoming calls i.e., 14626.



Row Labels	Count of Time
9_10	8.13%
10_11	11.28%
11_12	12.40%
12_13	10.72%
13_14	9.80%
14_15	8.95%
15_16	7.76%
16_17	7.45%
17_18	7.23%
18_19	6.13%
19_20	5.48%
20_21	4.67%
Grand Total	**100.00%**

From the above bar plot, we can infer that the time bucket 11_12 i.e., 11 AM to 12 PM has the highest share for incoming calls i.e., 12.40%

Count of Call_Status	Column Labels			
Row Labels	abandon	answered	transfer	Grand Total
01-Jan	684	3883	77	4644
02-Jan	356	2935	60	3351
03-Jan	599	4079	111	4789
04-Jan	595	4404	114	5113
05-Jan	536	4140	114	4790
06-Jan	991	3875	85	4951
07-Jan	1319	3587	42	4948
08-Jan	1103	3519	50	4672
09-Jan	962	2628	62	3652
10-Jan	1212	3699	72	4983
11-Jan	856	3695	86	4637
12-Jan	1299	3297	47	4643
13-Jan	738	3326	59	4123
14-Jan	291	2832	32	3155
15-Jan	304	2730	24	3058
16-Jan	1191	3910	41	5142
17-Jan	16636	5706	5	22347
18-Jan	1738	4024	12	5774
19-Jan	974	3717	12	4703
20-Jan	833	3485	4	4322
21-Jan	566	3104	5	3675
22-Jan	239	3045	7	3291
23-Jan	381	2832	12	3225
Grand Total	**34403**	**82452**	**1133**	**117988**
Avg calls on daily basis	**1496**	**3585**	**49**	**5130**
% of Avg calls on daily basis	**29%**	**70%**	**1%**	

From the table we can infer that the current abandon rate is around 30%. We need to propose a Manpower Plan i.e., new total number of people working per day.

• From the previous analysis we can derive that Avg calls answered per agent is 198.6 in each time bucket

• We need to reduce the abandon rate by 30%(current) – 10%(desired) = 20% i.e., we need to increase call answered rate by 70%(current) + 20%(change) = 90%

• So, we need to have 90% of the total calls to be answered so as to reduce the abandon rate to 10%
• Total avg calls incoming per day = 5130

• Avg calls answered per second = 198.6

• Answered rate = 90% i.e. 0.9

• Seconds per hour = 3600

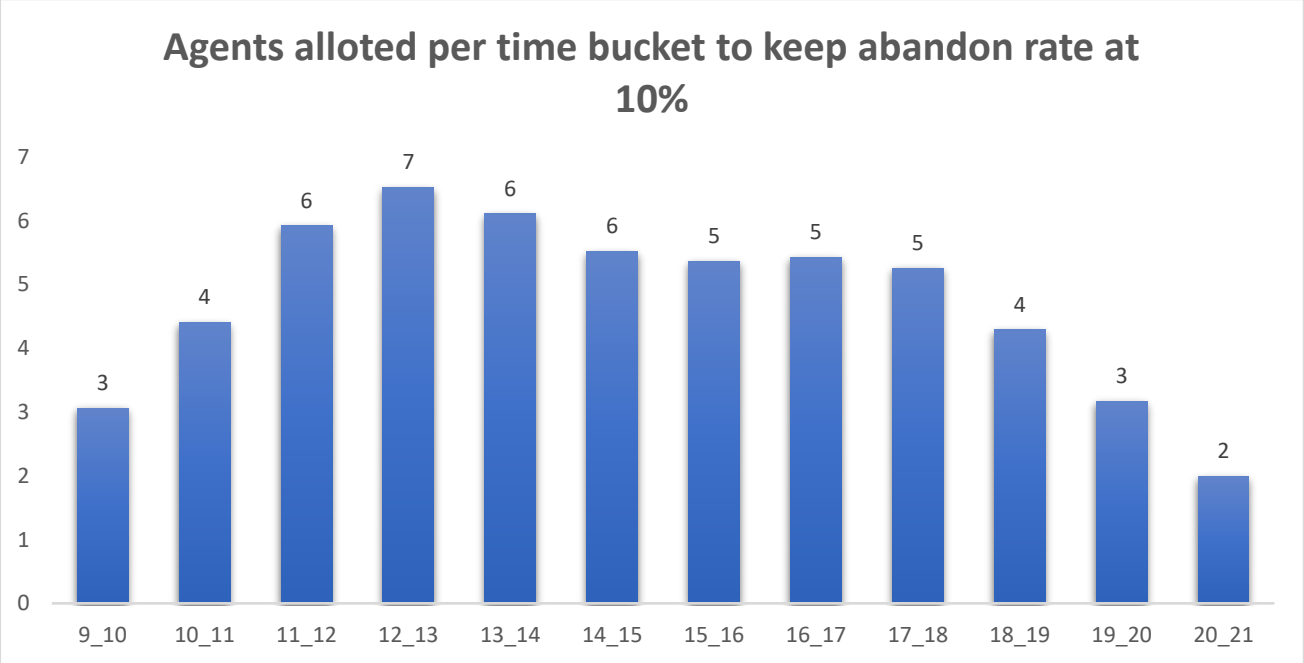
• So, time required to answer 90% of the incoming calls = 5130 * 198.6 * 0.9 / 3600 = 254.7001826.

• So, new total number of agents working per day is 255 divided by the number of hours an agent actually works (on a consumer call) i.e. 4.5 = 255/4.5 = 56.67 == 57 Agents working per day.

So, to have a 10% abandon rate we need 57 Agents working per day

The distribution of manpower plan per time bucket to keep abandon rate at 10% i.e., keeping call answered rate at 90% is as follows: -

Call_Status	answered	
Row Labels	**Count of Customer_**	**Agents alloted**
9_10	4428.0	3
10_11	6368.0	4
11_12	8560.0	6
12_13	9432.0	7
13_14	8829.0	6
14_15	7974.0	6
15_16	7760.0	5
16_17	7852.0	5
17_18	7601.0	5
18_19	6200.0	4
19_20	4578.0	3
20_21	2870.0	2
Grand Total	**82452.0**	**57**



From the assumptions given the following points were noted:-

▪ In a day an agent work for 9 hours → Total Agent working hours = 9 HOURS

▪ Out of the total 9 hours , 1.5 hours goes for lunch and coffee/tea breaks; so remaining working hours = 9 – 1.5 = 7.5 HOURS

▪ Out of the remaining 7.5 hours per day an agent is occupied with consumers call for only 60% of the time i.e., 60% of 7.5 i.e., 0.6 * 7.5 = 4.5 hours.

▪ So, an agent spends only 4.5 hours per day out of total 7.5 hours on consumer calls

▪ An agent works 6 days a week

▪ In a month of 30 days 6 days per week; In a month of 30 there are 4 weeks; 7 days per week means total 28 days out of which 4 days are unplanned leave

▪ Days of agent on floor = (20*7)/28 = 5 days

▪ Now, total days left 28 – 4 = 24 days

▪ Per week there is one Sunday which is an official holiday for all workplaces around the world; So in a month of 30 there are 4 Sundays

▪ Now total days left for work = 24 -4 = 20 days

▪ So, an agent is available to work for 20 days in a month of 30 days

• In a certain scenario there are calls from consumers not only during the day time but also during the night time and if there are no agents available during the night time to answer the call then it creates a bad impression on the consumer regarding the company.

• For a company the total calls made during day time by each consumer is 100 and during the night time it's 30 and the distribution in each time bucket of the night time calls is given as follows: -

Night time slot	9pm-10pm	10pm - 11pm	11pm - 12pm	12am - 1am	1am - 2am	2am - 3am	3am -4am	4am- 5am	5 am -6am	6am - 7am	7am -8am	8am -9am
Calls per slot	3	3	2	2	1	1	1	1	3	4	4	5

• Now we need to give the distribution of the total manpower available for each time bucket right from 9AM to 9 PM and then from 9 PM to 9 AM, keeping the abandon rate at 10% i.e., keeping the answered rate at 90%

• For each 100 day calls there are 30 night calls; then for 5130 day calls there will be : 5130*30/100 = 1539 night calls.

• So, there are 1539-night calls for a total of 5130-day calls

• So, the additional working hours keeping the answered rate at 90% will be 1539 * 198.6(avg calls answered per sec) * 0.9 / 3600(total seconds in each hour) = 76.41135

• So, additional agents needed by the company to answer night calls as well be 76.41135/4.5 = 16.98 == 17

• So, we need additional 17 agents to answer the night calls as well, making the total number of agents working per day keeping the answer rate to 90% will be 57(day call answer 90%) + 17(night call answer 90%) = 74 agents

• So, we need 74 Agents per day to answer the consumer calls from day as well as the night time keeping the answered rate to 90% / Abandon rate to 10%.

		Total hours needed		
Night time slot	Calls per slot	76.41135	Agents needed	Time distribution
21_22	3	7.641135	13	10%
22-23	3	7.641135	13	10%
23_24	2	5.09409	8	7%
00_01	2	5.09409	8	7%
01_02	1	2.547045	4	3%
02_03	1	2.547045	4	3%
03_04	1	2.547045	4	3%
04_05	1	2.547045	4	3%
05_06	3	7.641135	13	10%
06_07	4	10.18818	17	13%
07_08	4	10.18818	17	13%
08_09	5	12.735225	21	17%
Total	30	76.41135	126	100%

The table above shows the desired distribution of the night calls to keep the abandon rate at 10%.

• Since we have only 17 agents during night, we need to distribute in a nonanalytical way i.e., the agents who work in 19_20, 20_21-time bucket to wait and work in 21_22 and 22_23-time buckets as well

• Also, agents who work during 9_10, 10_11-time bucket can be asked to work for 7_8 and 8_9-time bucket as well

• The agents who work in the time bucket 1_2, 2_3, 3_4 and 4_5 can be asked to work in time buckets 6_7, 7_8 and 8_9 so as to keep the abandon rate at 10%.

Google Drive Link for Cleaned and Analyzed Excel sheet Data:

https://docs.google.com/spreadsheets/d/1Q5Zx8A0SM3vXchbtKGzI_HUdwQXxewRC/edit?usp=sharing&ouid=116077077614362440241&rtpof=true&sd=true