Business Analytics –Assignment 2
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Objectives:

- To analyse the given data and find out the Z-score and Box plot to understand the data better.
- To treat the 0 values as missing values and analyse the data.
- To take 10 SRSWR samples and 10 SRSWOR samples and analyse the data.
- To take one SRSWOR sample using stratified sampling method of size 100 from Non-churners and 100 from Churner group and analyse the data.

SECTION 1:

In the table 1 given below, we analyse how the acquisition of rental equipment effects the churn.
Here,
0= don't have rental equipment
1= have rental equipment
The sections are further divided according to the equipment rental over tenure.
The table shows that the people who don't have rental equipment churn 37.23%. All of them belonging to the 0-1000 equipment over tenure group.
It also shows that the people who have rental equipment churn the most, 62.77%, out of which the people belonging to 0-1000 equipment over tenure group churn 44.53% followed by the people belonging to 1000-2000 equipment over tenure group who churn 12.04% .

Table 1.a

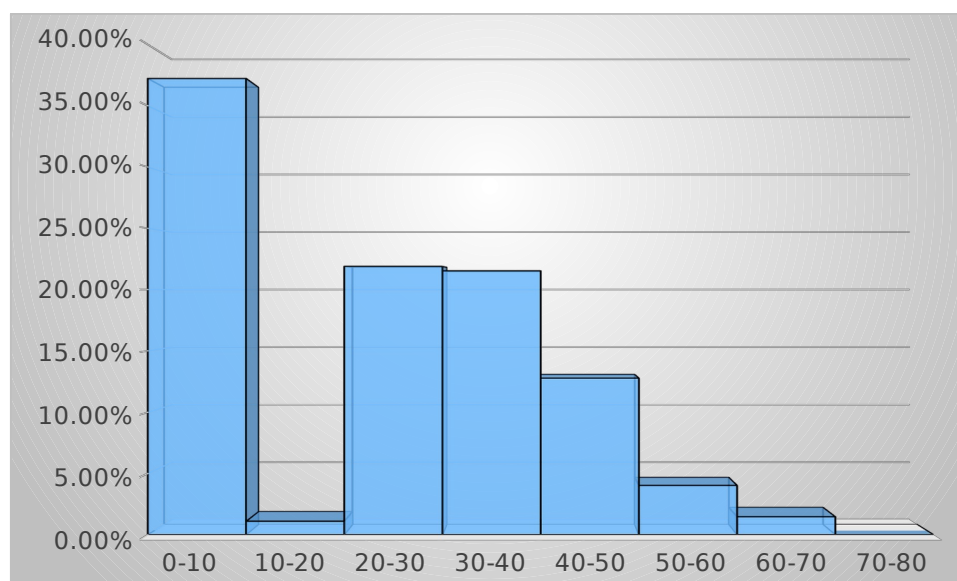| Equipment over tenure	% churn
0	**37.23%**
0-1000	37.23%
1	**62.77%**
0-1000	44.53%
1000-2000	12.04%
2000-3000	4.74%
3000-4000	1.46%
4000-5000	0.00%
5000-6000	0.00%
Grand Total	**100.00 %**
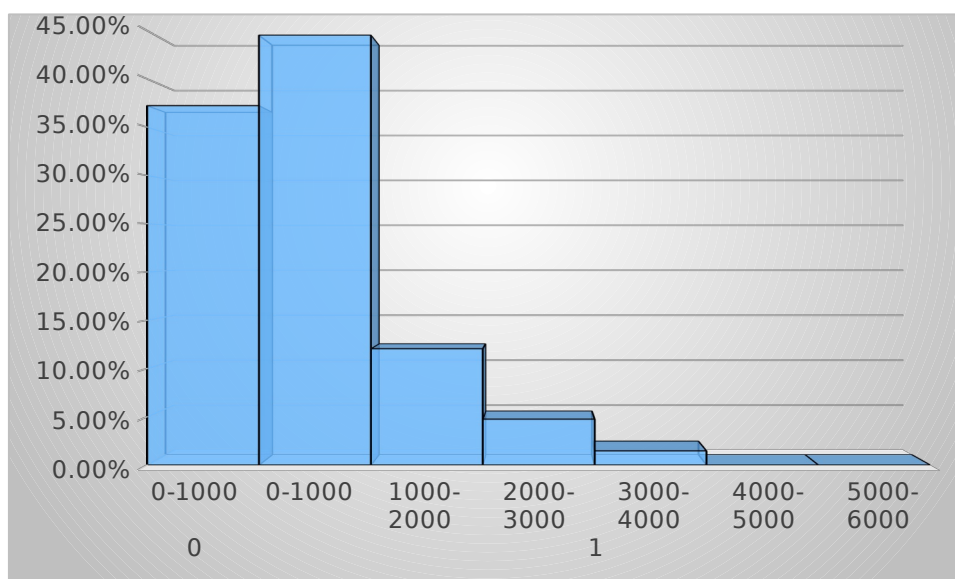
Histogram 1.a
(Rental Equipment over tenure vs Percentage Churn)

The histogram of the rental equipment over entire tenure shows left skewness.

Table 1.b

Equipment Rental over Last Month	% Churn
0-10	37.23%
10-20	1.09%
20-30	21.90%
30-40	21.53%
40-50	12.77%
50-60	4.01%
60-70	1.46%
70-80	0.00%
Grand Total	**100.00%**

Histogram 1.b
(Rental Equipment over last month vs Percentage Churn)

In the table 2 given below, we analyse how the toll free services effects the churn.
Here,
0= don't have toll free services
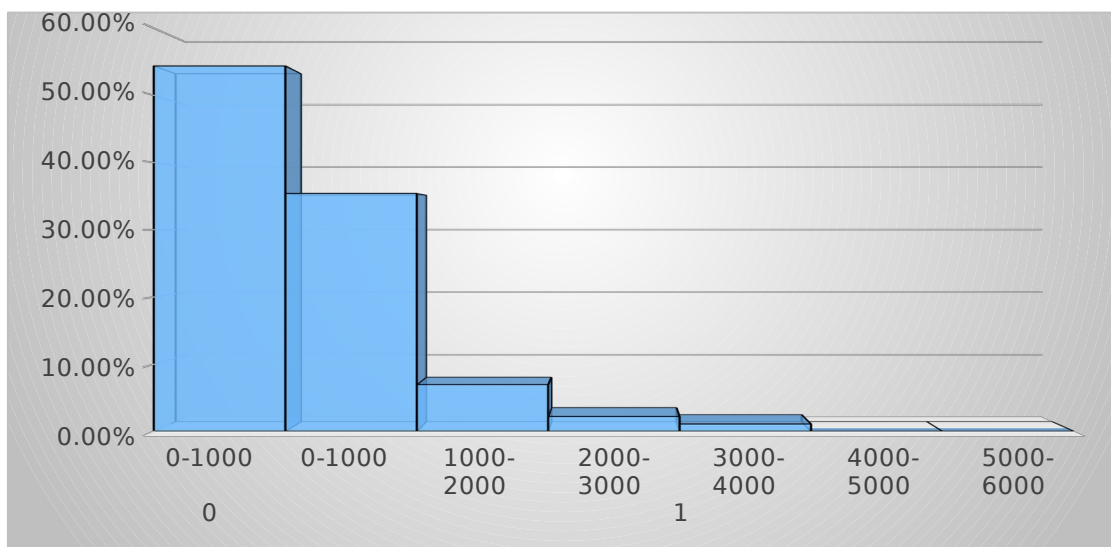1= have toll free services
The sections are further divided according to the toll free services over tenure.
The table shows that the people who don't have toll free services churn the most, 54.38%. All of them belonging to the 0-1000 toll free services over tenure group.
It also shows that the people who have toll free services churn 45.62%, out of which the people belonging to 0-1000 toll free services over tenure group churn 35.40% followed by the people belonging to 1000-2000 equipment over tenure group who churn 6.93% .

Table 2.a

Toll Free Services	%Churn
0	**54.38%**
0-1000	54.38%
1	**45.62%**
0-1000	35.40%
1000-2000	6.93%
2000-3000	2.19%
3000-4000	1.09%
4000-5000	0.00%
5000-6000	0.00%
Grand Total	**100.00%**

Histogram 2.a
(Toll Free Services over tenure vs Percentage Churn)

Table 2.b

| Toll free Service last month	%churn
0-10	55.47%
10-20	15.33%
20-30	20.44%
30-40	6.20%
40-50	1.82%
50-60	0.73%
60-70	0.00%
70-80	0.00%
80-90	0.00%
170-180	0.00%
Grand Total	**100.00%**
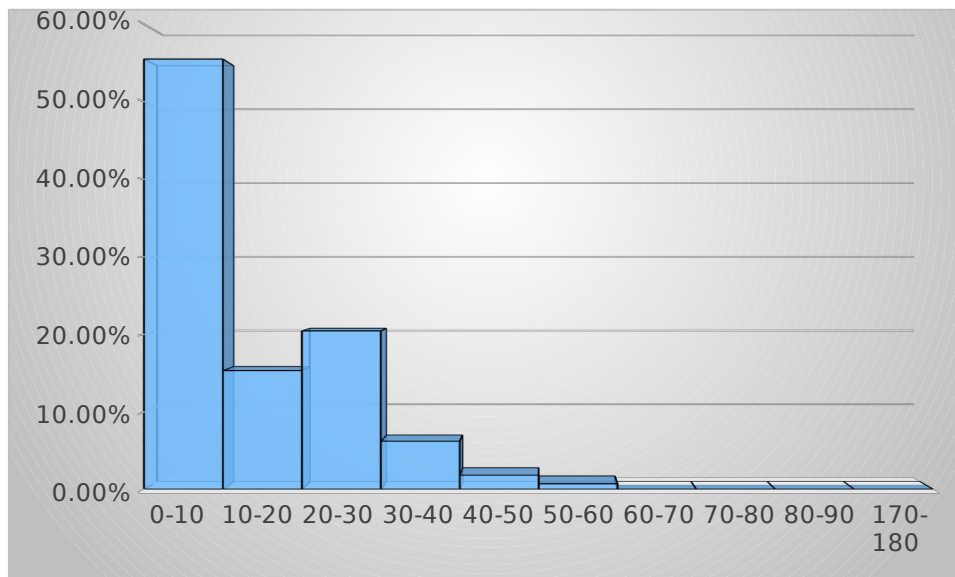
Histogram 2.b
(Toll Free Services over last month vs Percentage Churn)

In the table 3 given below, we analyse how the long distance calls effects the churn.

The sections are further divided according to the long distance calls over tenure. The table shows that the people belonging to the long distance call over tenure group 0.9-1000.9 churn the most, 96.35% followed by the people belonging to 1000.9-2000.9 group who churn 3.65%

Table 3.a

Long Distance call over tenure	% Churn
0.9-1000.9	96.35%
1000.9-2000.9	3.65%
2000.9-3000.9	0.00%
3000.9-4000.9	0.00%
4000.9-5000.9	0.00%
5000.9-6000.9	0.00%
6000.9-7000.9	0.00%
7000.9-8000.9	0.00%
Grand Total	**100.00%**
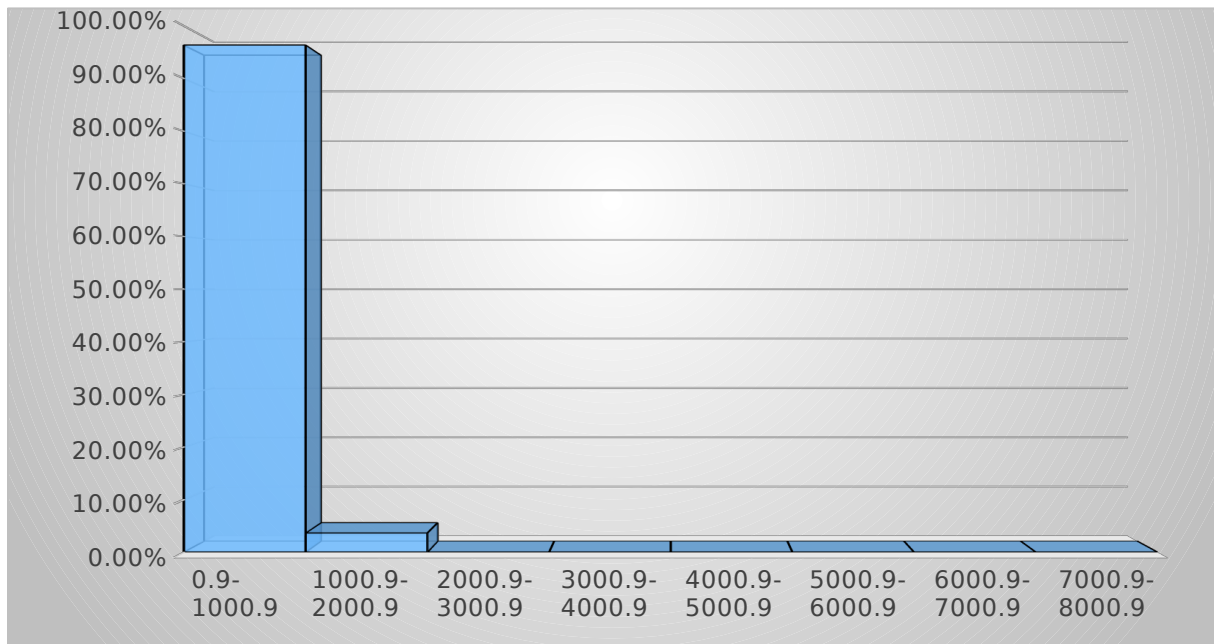
Histogram 3.a
(Long Distance Calls over tenure vs Percentage Churn)

Table 3.b

| Long distance call over last month	%churn
0.9-10.9	83.94%
10.9-20.9	14.23%
20.9-30.9	1.82%
30.9-40.9	0.00%
40.9-50.9	0.00%
50.9-60.9	0.00%
60.9-70.9	0.00%
70.9-80.9	0.00%
80.9-90.9	0.00%
90.9-100.9	0.00%
Grand Total	**100.00%**
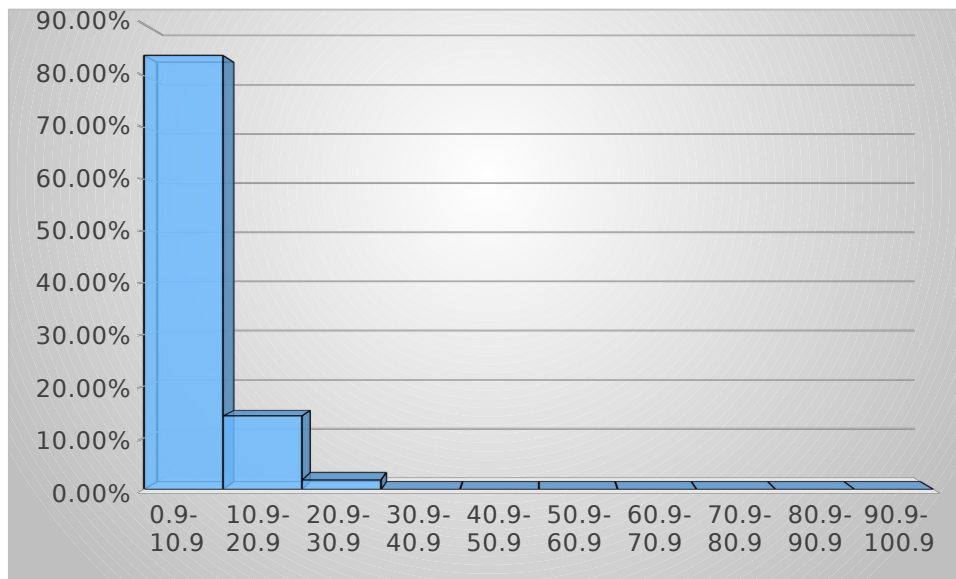
Histogram 3.b
(Long Distance Calls over last month vs Percentage Churn)

Since the values of people having rental equipment was given as either 0 or 1, the graph of all the Z-scores gives us two points.
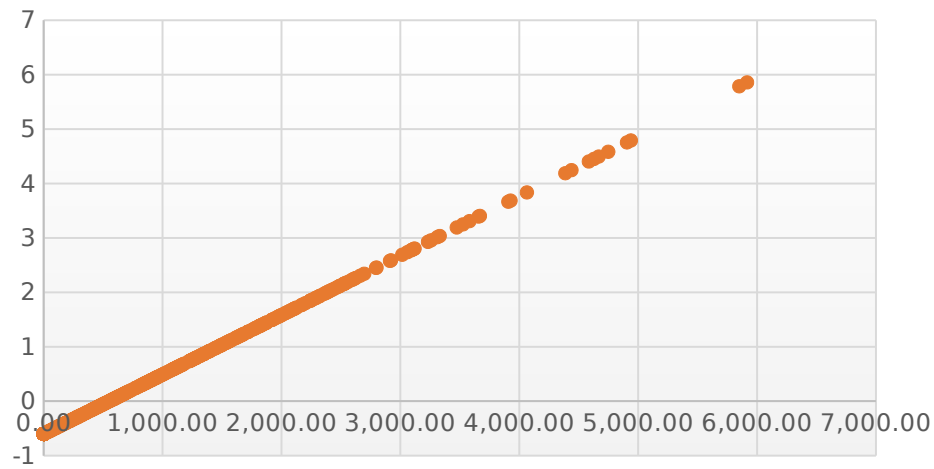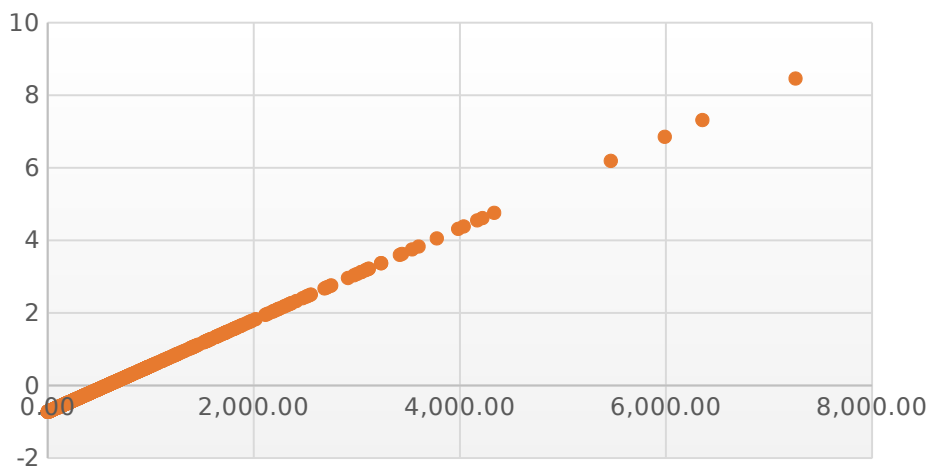

Zscore-Rental Equipment
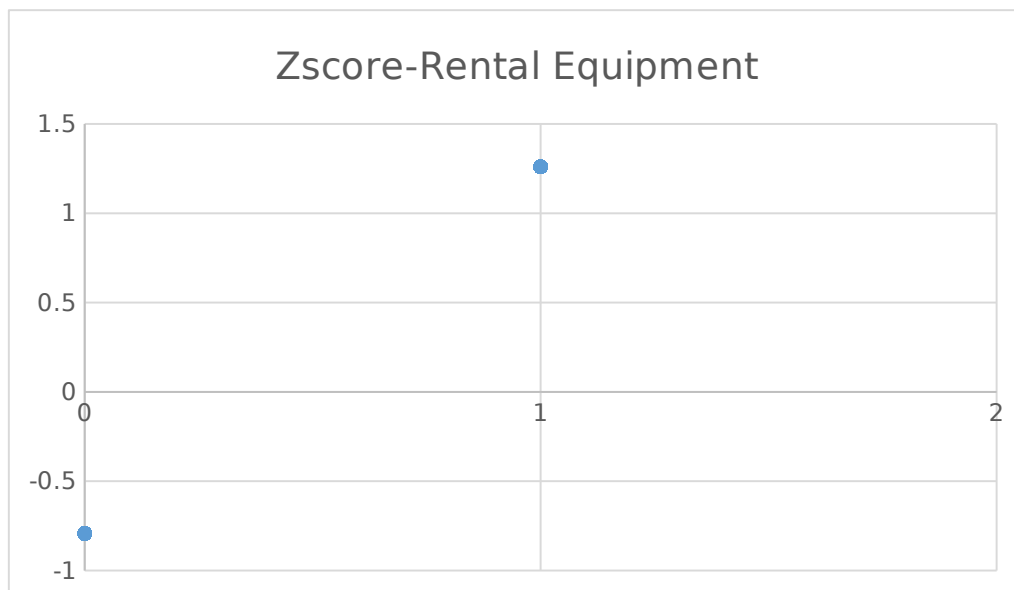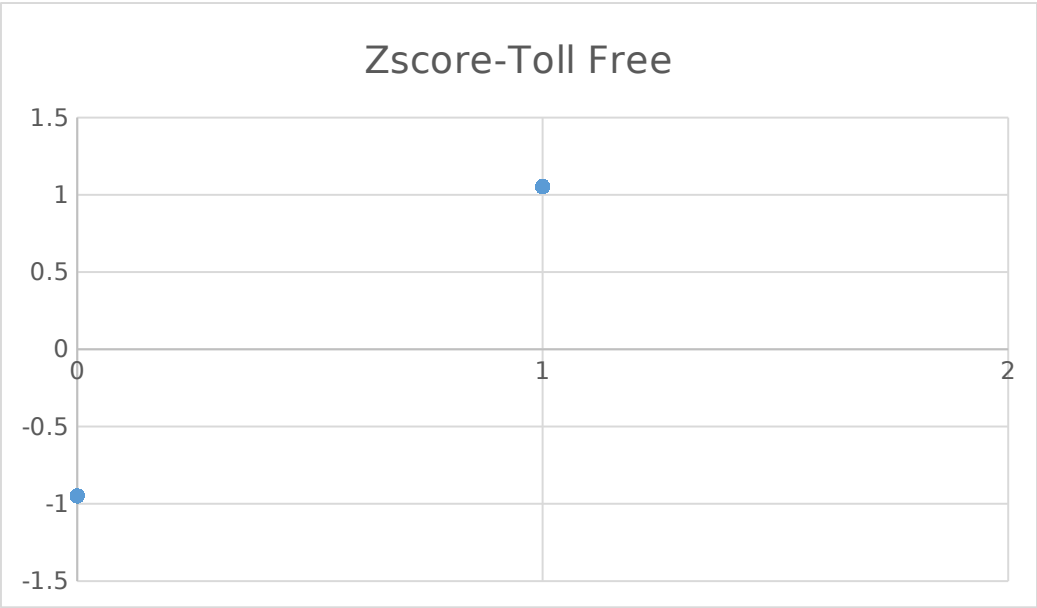
Zscore-Toll Free

	Equipten	Longten	Tollten
Min	0.00	0.90	0.00
Q1	0	90.1375	0
Mean	465.63	574.05	551.26
Q3	579.45	755.025	846.9
Max	5,028.65	7,257.60	5,916.00
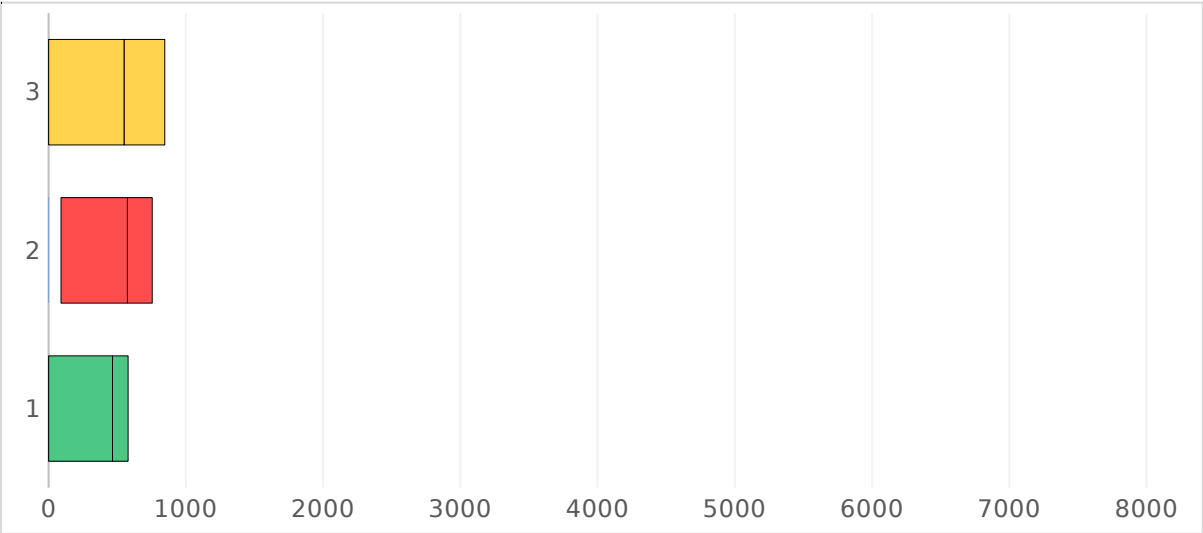
Z-Score-Tollten

Z-Score-Longten

Z-Score-Equipten
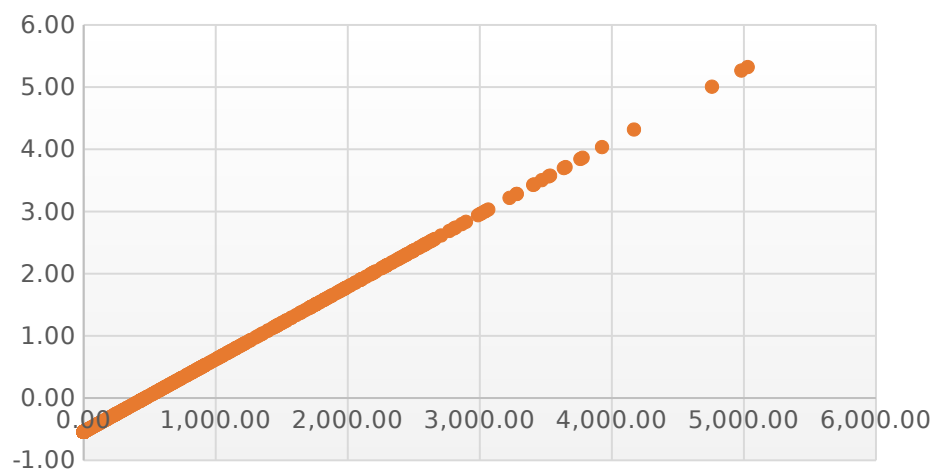
SECTION 2:

Equipment over last month	%churn	Sum of churn
15.4-25.4	18.60%	32
25.4-35.4	37.21%	64
35.4-45.4	27.33%	47
45.4-55.4	12.79%	22
55.4-65.4	4.07%	7
65.4-75.4	0.00%	0
75.4-85.4	0.00%	0
Grand Total	**100.00%**	**172**
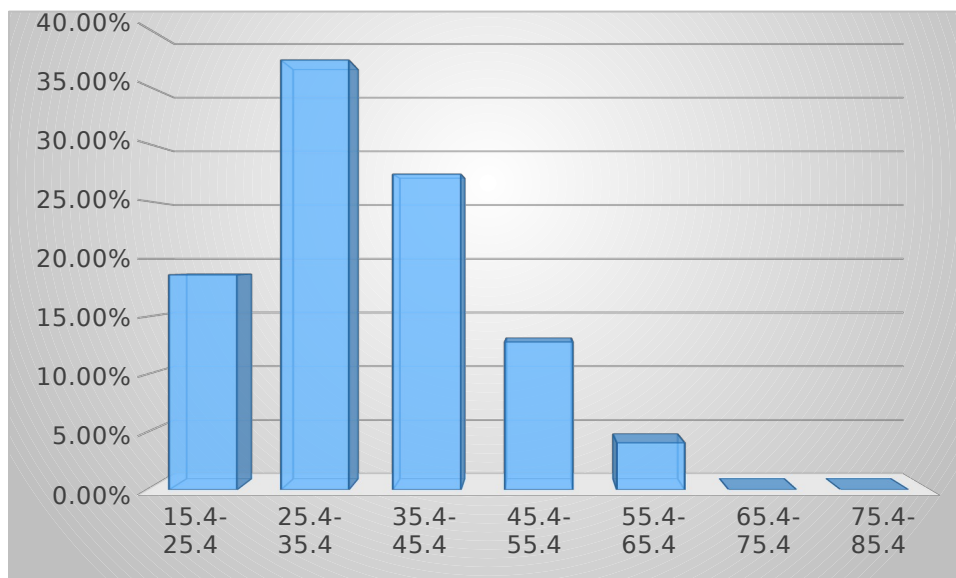
Toll over the last month	%churn	Sum of churn
5.75-15.75	14.40%	18
15.75-25.75	56.00%	70
25.75-35.75	18.40%	23
35.75-45.75	6.40%	8
45.75-55.75	4.00%	5
55.75-65.75	0.80%	1
65.75-75.75	0.00%	0
75.75-85.75	0.00%	0
85.75-95.75	0.00%	0

	100.0	
Grand Total	**0%**	**125**
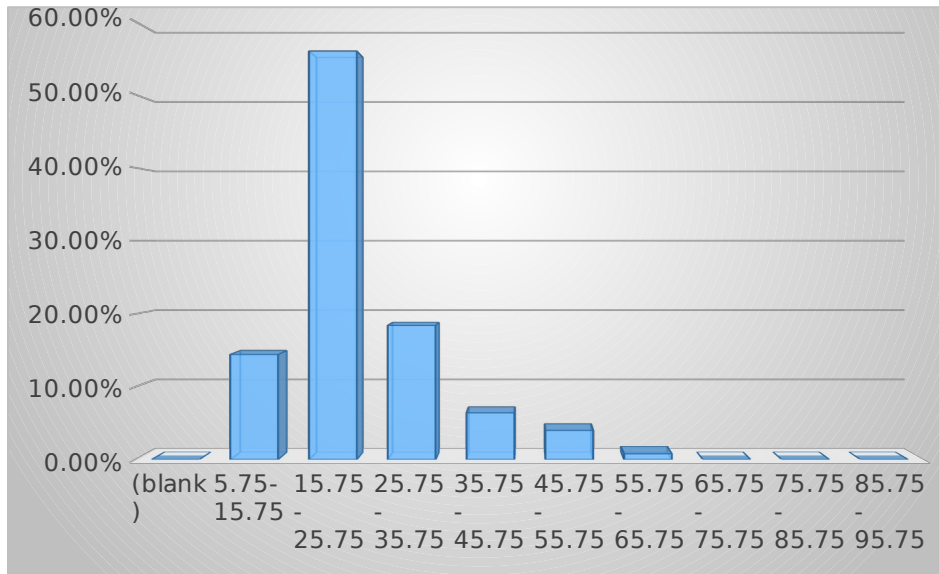
Long Distance call over last month	Sum of churn	%churn
0.9-10.9	230	83.94%
10.9-20.9	39	14.23%
20.9-30.9	5	1.82%
30.9-40.9	0	0.00%
40.9-50.9	0	0.00%
50.9-60.9	0	0.00%
60.9-70.9	0	0.00%
70.9-80.9	0	0.00%
80.9-90.9	0	0.00%
90.9-100.9	0	0.00%
Grand Total	**274**	**100.00%**

Zscore- Equipmon

Zscore-TollMon

Zscore-LongMon
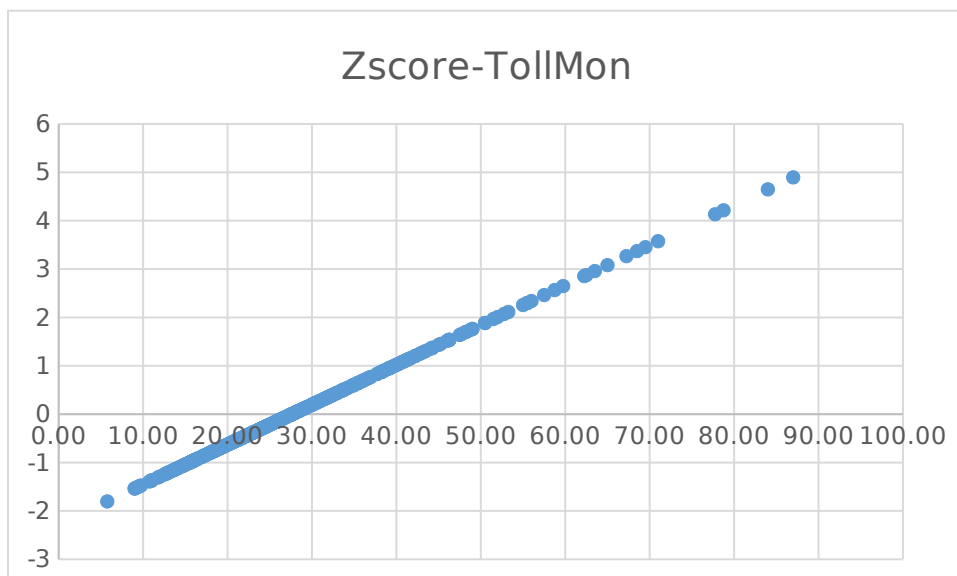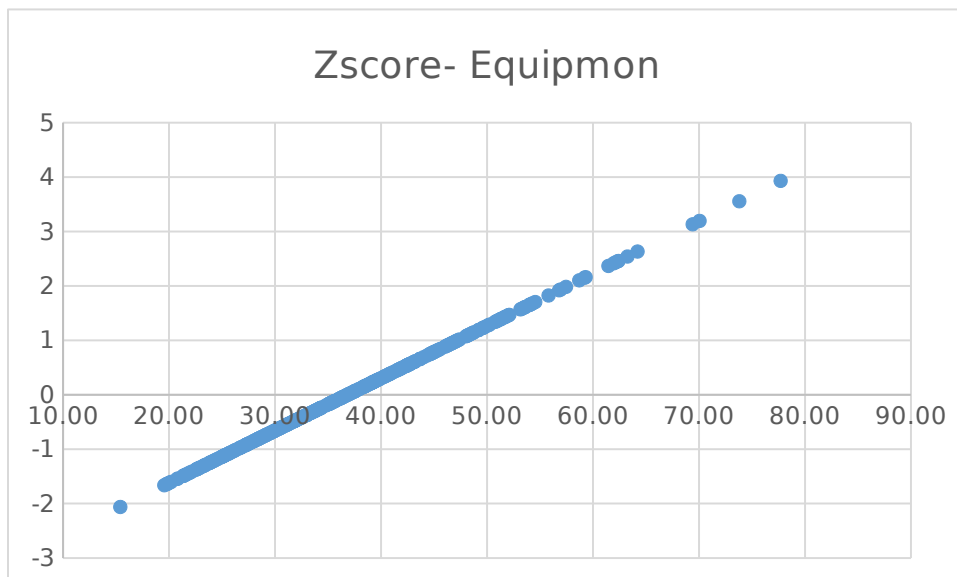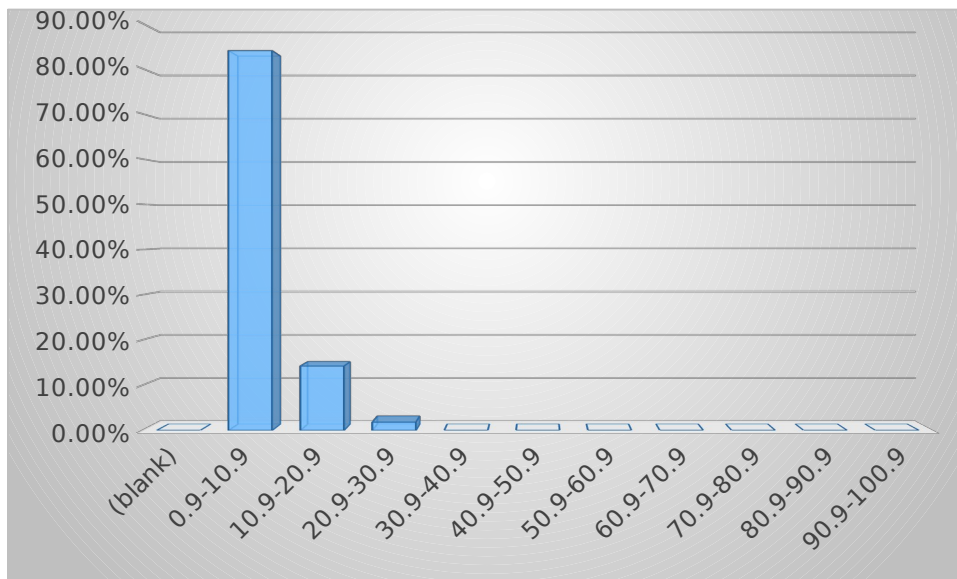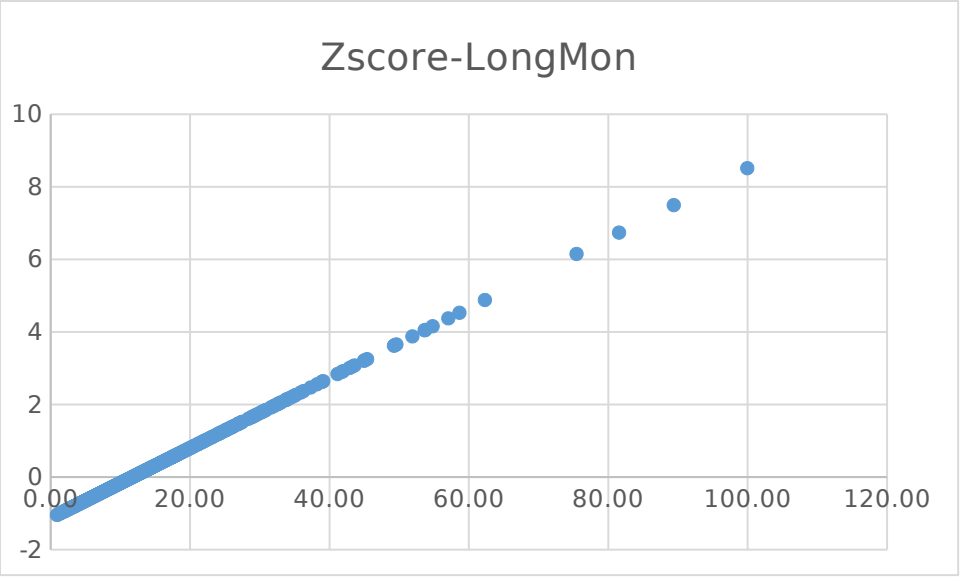
	Equipm on	Tollm on	Longm on
Min	15.40	5.75	0.90
Q1	29.0125	19.5	5.2
Mean	36.84	27.64	11.72
Q3	42.8375	32.68 75	14.412 5
Max	77.70	87.00	99.95