1. Problem Statement:

Every day large number of patients call XYZ Health Services provider regarding their problems or health issues.The provider follows a ticketing system for all the telephonic calls received across all the departments. Calls to the provider can be for New Appointment, Cancellation, Lab Queries, Medical Refills, Insurance Related, and General Doctor Advise etc. The Tickets have the details of Summary of the call and description of the calls written by various staff members with no standard text guidelines. Based on the Text in the Summary and Description of the call, the ticket is to be classified to Appropriate Category and Subcategories.

So here we will build predictive models which can identify predict Category (out of 5 Categories) and Subcategories (Out of 20 Sub Categories) based on the Text in the Summary and Description of the call.

2. Data Exploration:-

2.1 Data used:

As provided there is only one different data source having 7 variables and 57280 observations. We'll divide this data in train (75% of original data) and test (25% of original data).

2.2 Variables used :-

- fileid
- SUMMARY
- DATA
- categories(Dependent variable, Levels:5)
- sub_categories (Dependent variable, Levels:20)
- previous_appointment
- ID

** Data dictionary was not provided

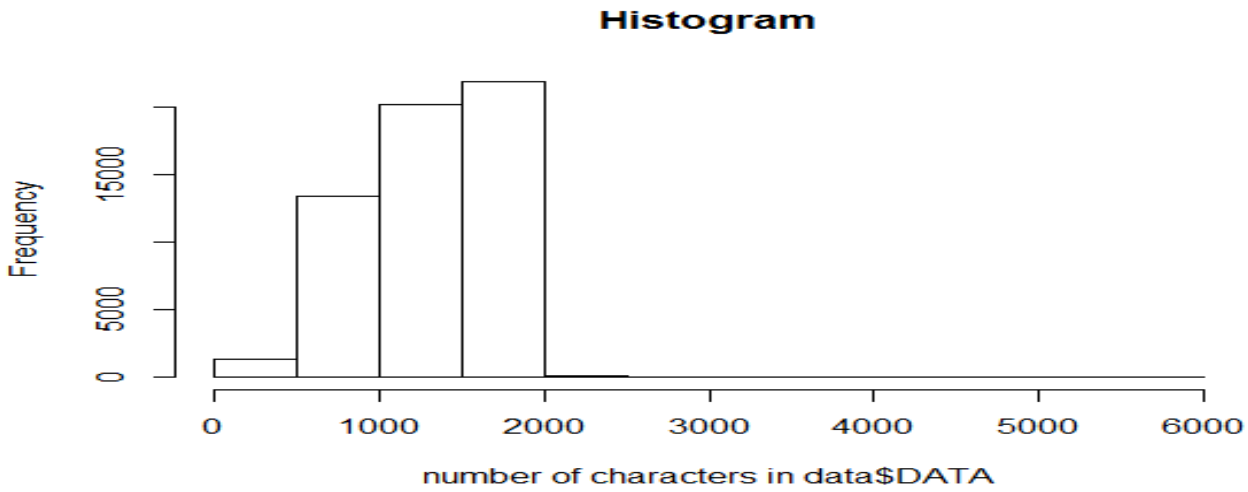
3. **Exploration of Numerical Variable:-**

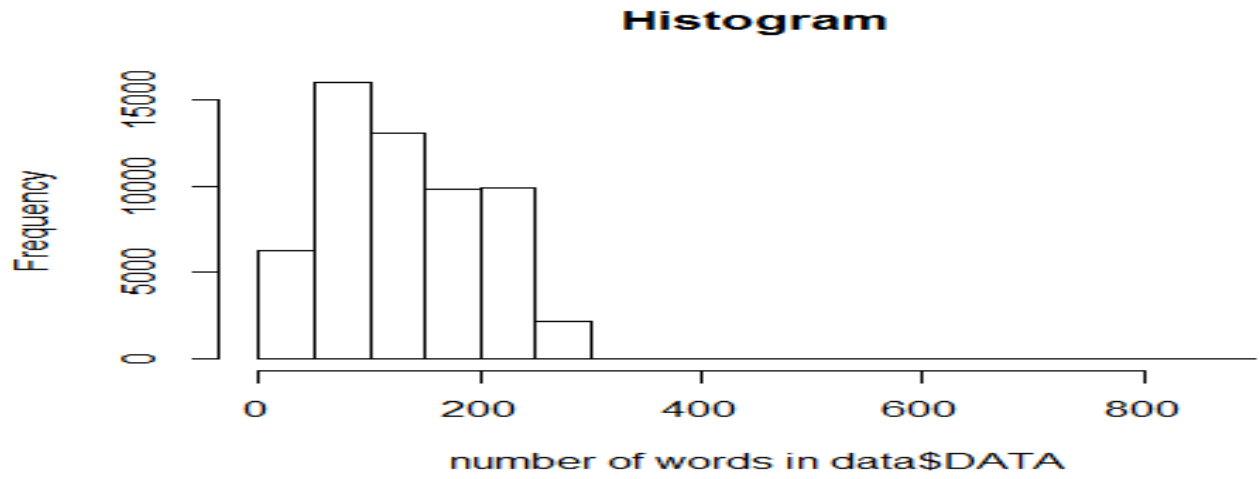
3.1. Missing Values: - There're no missing values in data

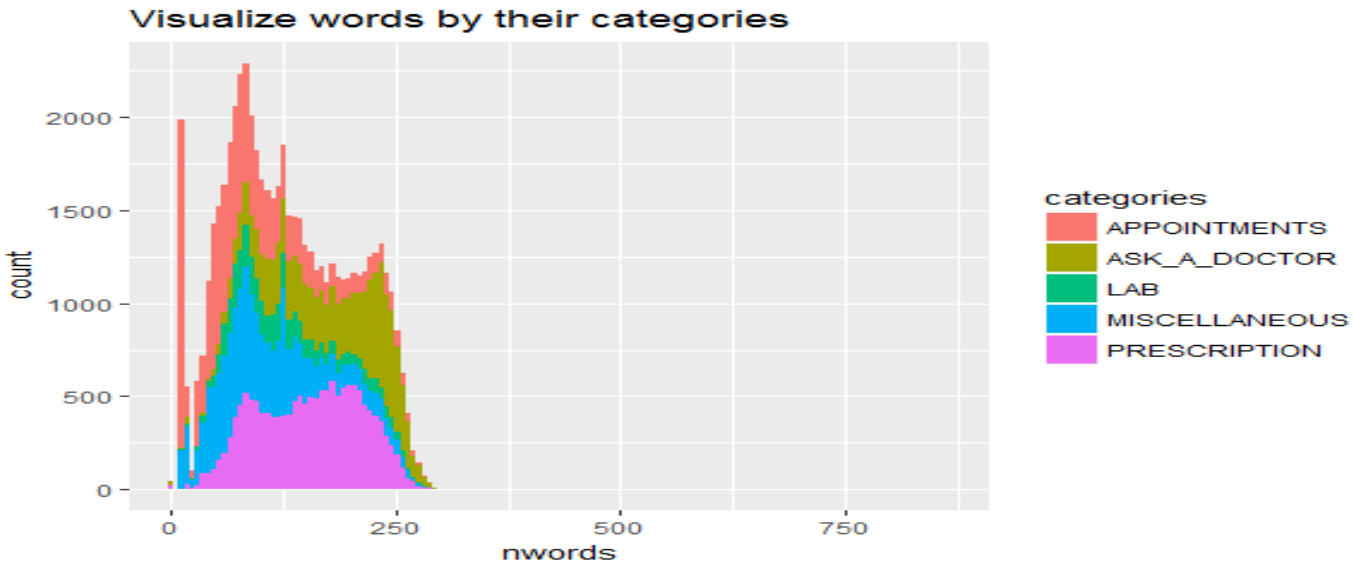
3.2. Checking the distributions.

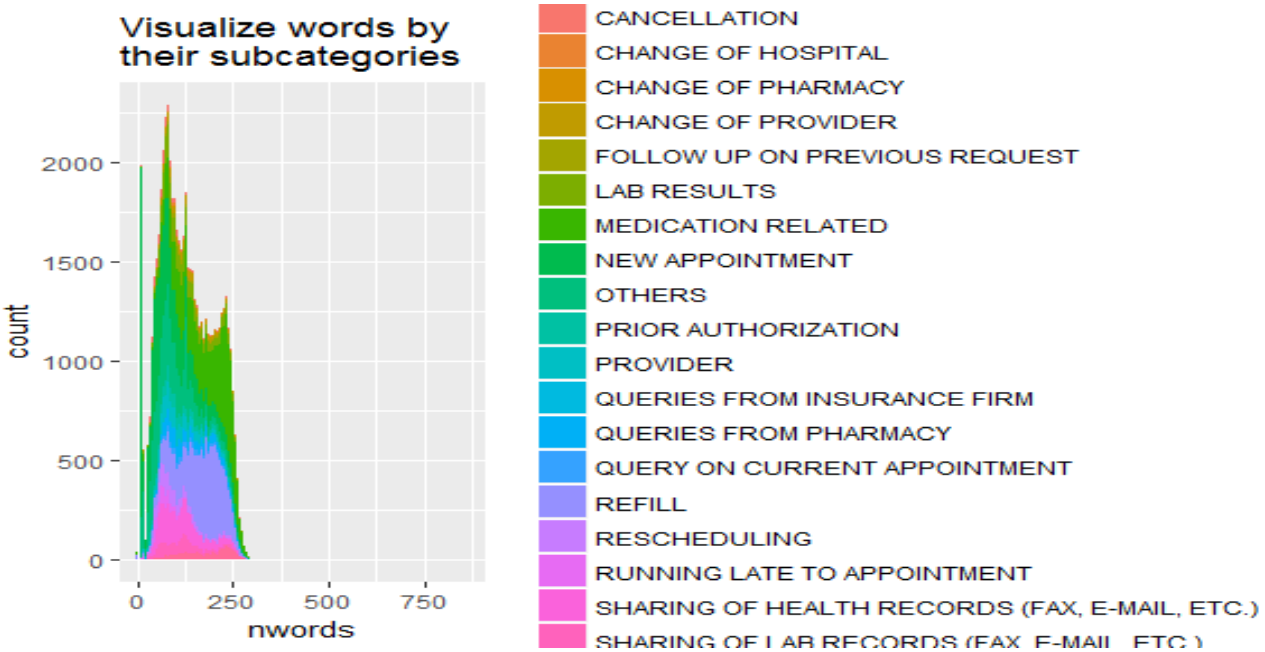
We've counted the number of characters and number of words in DATA to check their frequency in DATA.

Then we've checked the distribution of variables "Categories" and "Sub_categores" in DATA by no of words (ie. nwords) against its frequency.







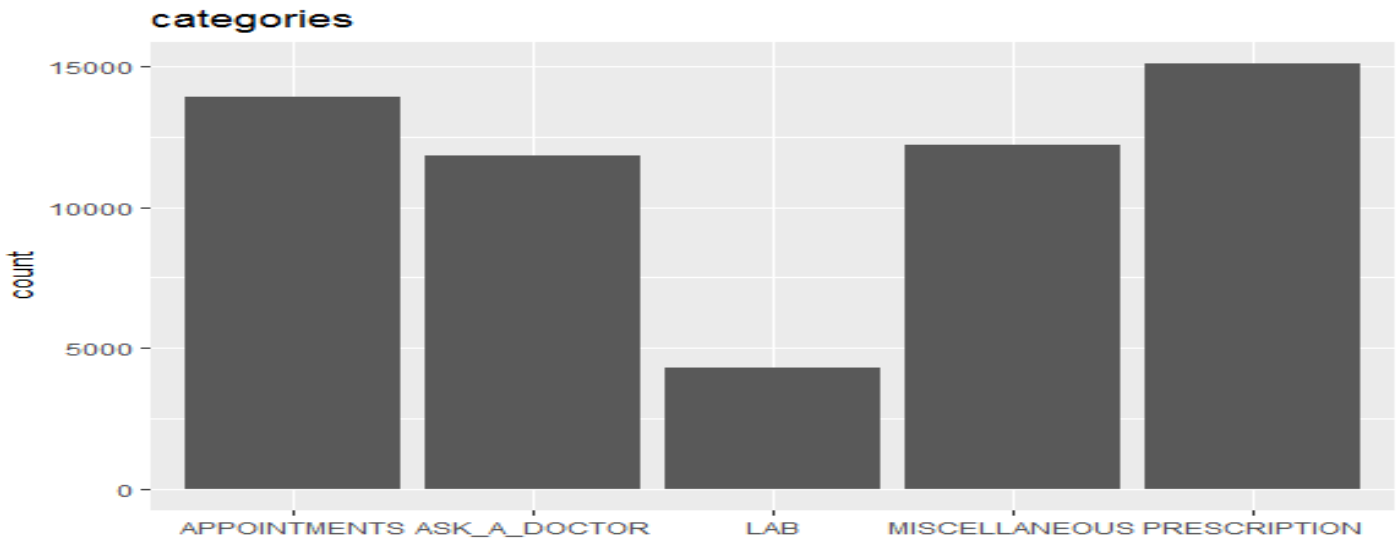


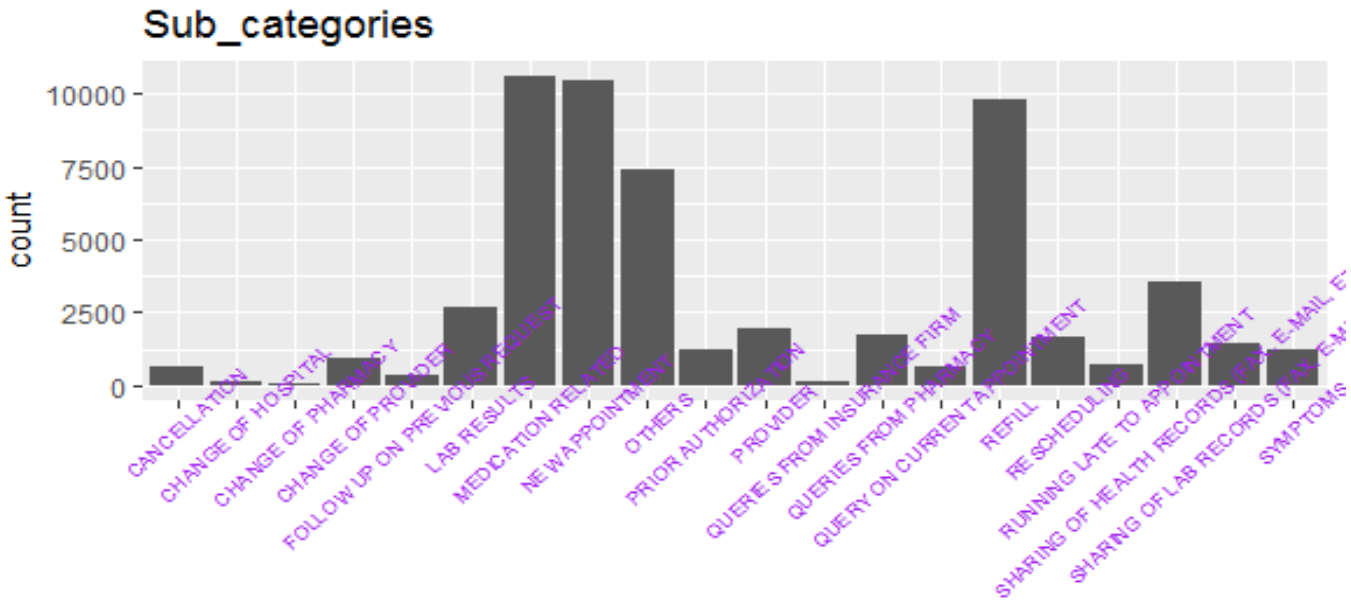
4. Exploration of Categorical Variable: --

After getting the data altogether it has dimension of 60 variables and 57280 observations. Out of 60 variables, 3 were categorical variables, out of which two are dependent variables.

4.1 Checking the distribution of the variables:

Histogram was plotted to check the distribution of the dependent variables “categories” and “subcategories”





4.2. Table of dependent variable categories.

Kindly note all values are in %.

APPOINTMENTS	ASK_A_DOCTOR	LAB	MISCELLANEOUS	PRESCRIPTION
24.217877	20.600559	7.543645	21.283170	26.354749

4.3. Table of dependent variable subcategories.

CANCELLATION	CHANGE OF HOSPITAL
1.15747207	0.26012570

```
    CHANGE OF PHARMACY                                          CHANGE OF PROVIDER
      0.09601955                                                 1.66375698
    FOLLOW UP ON PREVIOUS REQUEST                               LAB RESULTS
      0.62325419                                                 4.62639665
    MEDICATION RELATED                                          NEW APPOINTMENT
      18.50384078                                                18.29259777
     OTHERS                                                     PRIOR AUTHORIZATION
      12.87884078                                                2.14036313
    PROVIDER                                                    QUERIES FROM INSURANCE FIR
M
      3.44273743                                                 0.18680168
    QUERIES FROM PHARMACY                                       QUERY ON CURRENT APPOINTME
NT
      3.00628492                                                 1.14699721
     REFILL                                                     RESCHEDULING
      17.14210894                                                2.83868715
    RUNNING LATE TO APPOINTMENT             SHARING OF HEALTH RECORDS (FAX, E-MAIL, ET
C.)
       1.21159218                                                6.19762570
   SHARING OF LAB RECORDS (FAX, E-MAIL, ETC.)                   SYMPTOMS
       2.48777933                                                2.09671788
```

4.4. Table of independent variable previous_appointment.

```
      No       Yes
99.659567  0.340433
```

5. Hypothesis Testing

5.1. Chi-Square Test

This test is used to check the independence of two categorical variables

Null Hypothesis: The two categorical variables are independent.

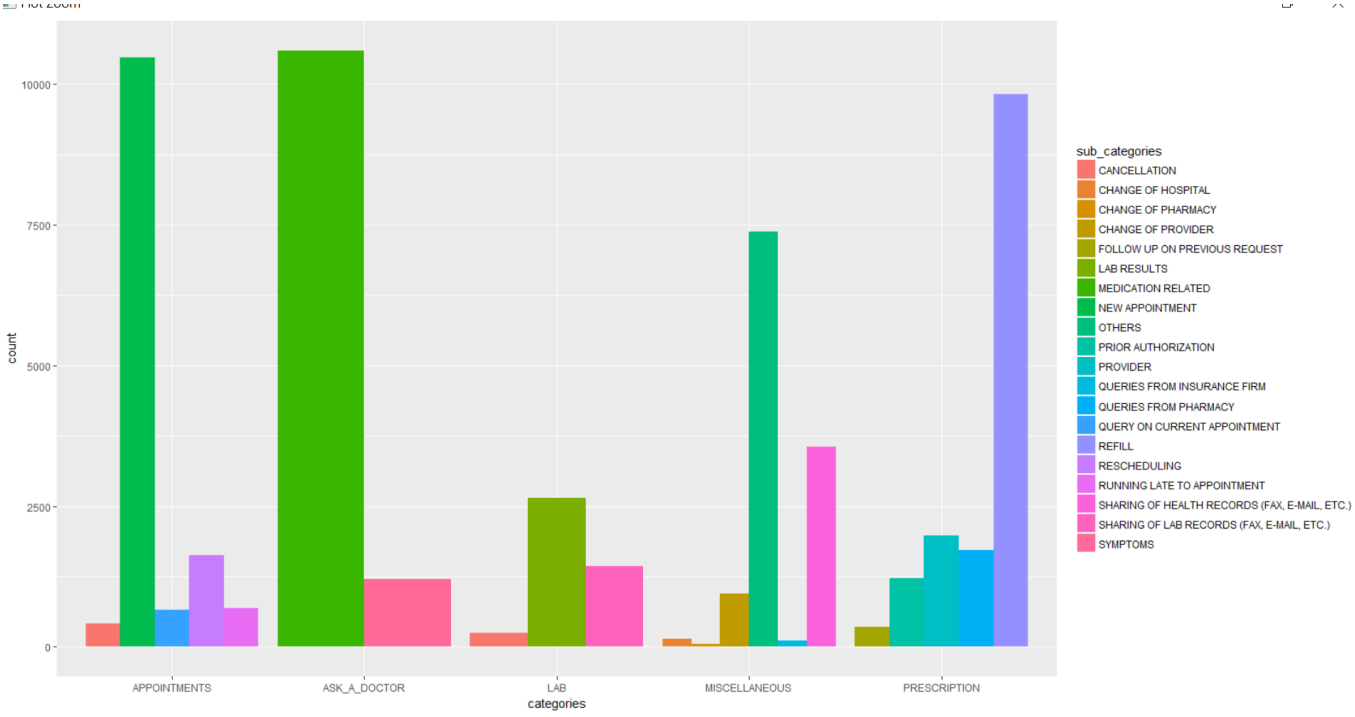
Alternative Hypothesis: The two categorical variables are dependent.

Question a): Are categories and sub_categories are dependent at 5% level of significance.
We see P-Value < 0.05 , So we can reject Null Hypothesis. In simple words, Categories and sub_categories are dependent. Results are showed in Graph1

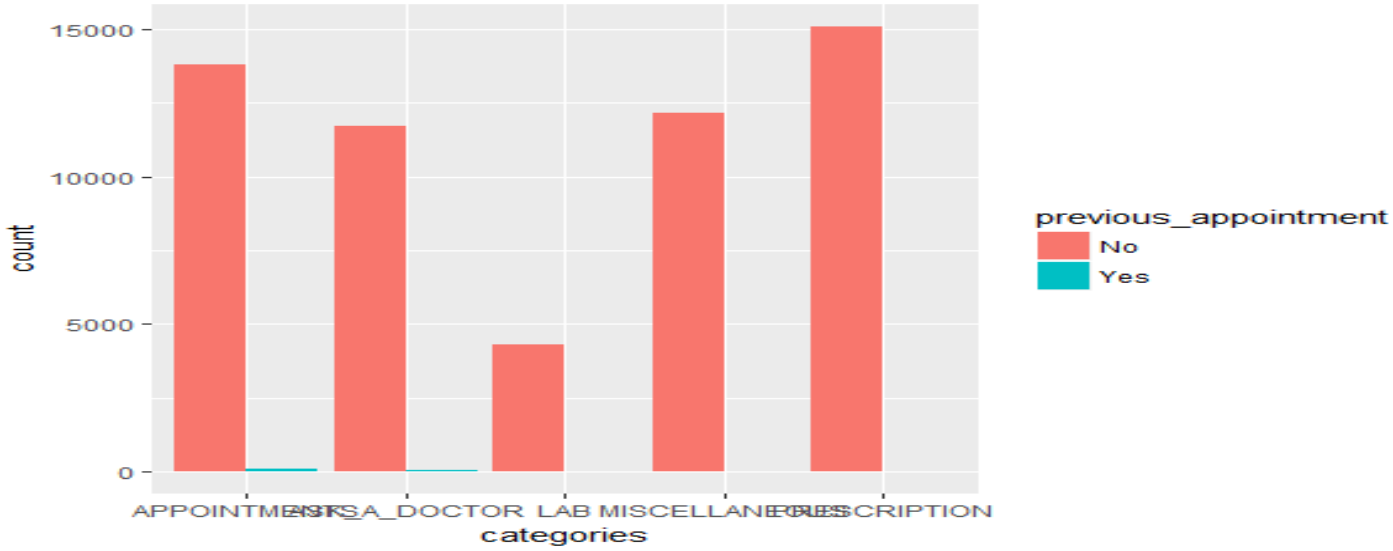
```
        Pearson's Chi-squared test

data:  data$categories and data$sub_categories
X-squared = 226430, df = 76, p-value < 2.2e-16
```

Question b): Are Categories and previous_appointment are dependent at 5% level of significance.
Are Categories and previous_appointment are dependent at 5% level of significance.
We see P-Value < 0.05 , So we can reject Null Hypothesis. In simple words, Categories and previous_appointment are dependent. Results are showed in Graph2.

Graph1:-



Graph2:-



6. TEXT MINING:-

We convert text in to Corpus and then perform all steps of preprocessing such as removePunctuation, remove stopwords ,stripWhitespace, stemDocument, removeNumbers etc. Then we converted in Document –Term-Matrix with sparsity 80%

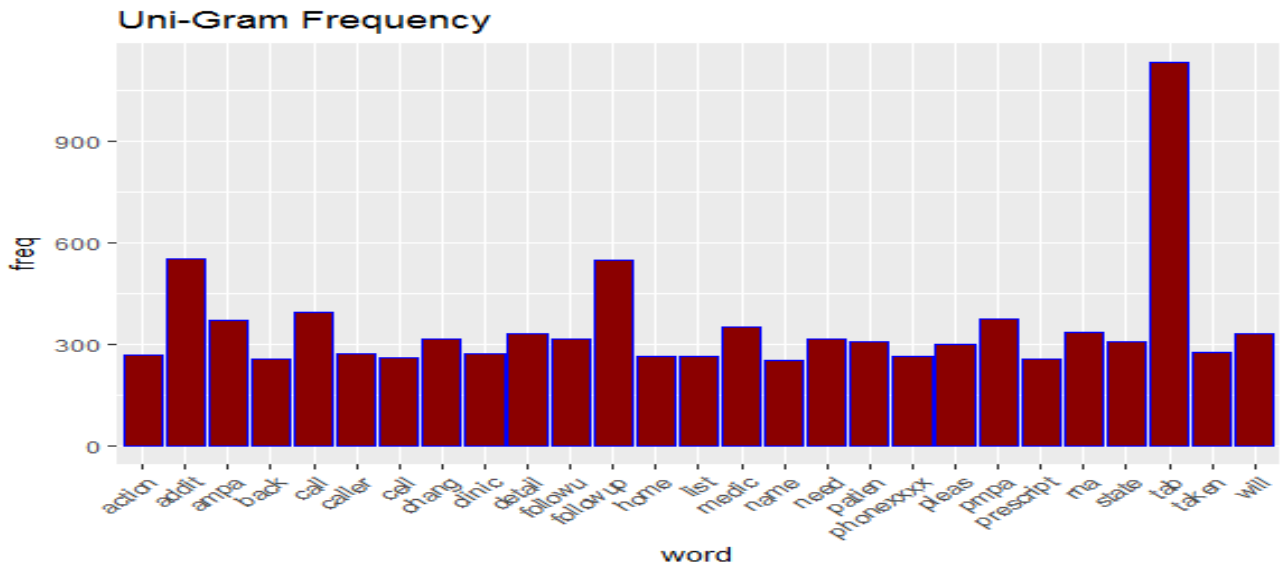
6.1 Draw Word Cloud:-

We've drawn word cloud whose frequency is greater than 200 times.

6.2 N-gram(1 gram) tokenization of the Corpus:-

We can perform N-gram(1 gram) tokenization of the Corpus.Here we've performed uni-gram.

Uni-Gram:-



7. Building Predictive Models

The data is divided into training and testing set in the proportion of 1/3:2/3(Class balanced is kept in mind)

7.1.Naïve Bayes Model:-

Model was built on training data and tested on test data. Confusion matrix, Accuracy has been checked. We've first built Xgboost Model to predict Categories and then again we've built model to predict sub_categories. Confusion matrix, Kappa, Accuracy has been checked. The model is 82.76 % accurate to predict categories.

Confusion Matrix for Categories:-

```
Confusion Matrix and Statistics

               Reference
Prediction      APPOINTMENTS ASK_A_DOCTOR  LAB MISCELLANEOUS PRESCRIPTION
  APPOINTMENTS          3465          43   29            15           96
  ASK_A_DOCTOR           509        3608  196           461           95
  LAB                    494         128 1121           133          262
  MISCELLANEOUS            2         146   27          3262          234
  PRESCRIPTION           154           8   67           193         4345

Overall Statistics

               Accuracy : 0.8276
                 95% CI : (0.8221, 0.8329)
    No Information Rate : 0.2636
    P-Value [Acc > NIR] : < 2.2e-16

                  Kappa : 0.7806
 Mcnemar's Test P-Value : < 2.2e-16

Statistics by Class:

                     Class: APPOINTMENTS Class: ASK_A_DOCTOR Class: LAB Class: MISCELL
ANEOUS
Sensitivity                       0.7494              0.9174    0.77847
0.8027
Specificity                       0.9874              0.9168    0.94239
0.9728
Pos Pred Value                    0.9498              0.7410    0.52432
0.8886
Neg Pred Value                    0.9250              0.9772    0.98119
0.9480
Prevalence                        0.2422              0.2060    0.07542
0.2129
Detection Rate                    0.1815              0.1890    0.05871
0.1708
Detection Prevalence              0.1911              0.2550    0.11198
0.1923
Balanced Accuracy                 0.8684              0.9171    0.86043
0.8877
                     Class: PRESCRIPTION
Sensitivity                       0.8635
Specificity                       0.9700
Pos Pred Value                    0.9115
Neg Pred Value                    0.9520
Prevalence                        0.2636
Detection Rate                    0.2276
Detection Prevalence              0.2497
Balanced Accuracy                 0.9167
```

Confusion Matrix for Subcategories:-

Below table looks quite messy, So check it in table_subcategories_NaiveBayes.csv file.

```
 Confusion Matrix and Statistics

                                                Reference
 Prediction                                      CANCELLATION CHANGE OF HOSPITAL CHANGE OF PH
   CANCELLATION                                          111                   1
   CHANGE OF HOSPITAL                                      3                   1
   CHANGE OF PHARMACY                                      0                   0
   CHANGE OF PROVIDER                                      1                   9
   FOLLOW UP ON PREVIOUS REQUEST                           0                   2
```

LAB RESULTS	6	0
MEDICATION RELATED	2	3
NEW APPOINTMENT	9	0
OTHERS	7	4
PRIOR AUTHORIZATION	0	2
PROVIDER	6	1
QUERIES FROM INSURANCE FIRM	1	0
QUERIES FROM PHARMACY	1	0
QUERY ON CURRENT APPOINTMENT	24	1
REFILL	2	3
RESCHEDULING	6	1
RUNNING LATE TO APPOINTMENT	19	2
SHARING OF HEALTH RECORDS (FAX, E-MAIL, ETC.)	0	9
SHARING OF LAB RECORDS (FAX, E-MAIL, ETC.)	10	1
SYMPTOMS	13	10

Prediction	Reference CHANGE OF PROVIDER	FOLLOW UP ON PREVIOUS REQ
CANCELLATION	2	
CHANGE OF HOSPITAL	7	
CHANGE OF PHARMACY	0	
CHANGE OF PROVIDER	161	
FOLLOW UP ON PREVIOUS REQUEST	1	
LAB RESULTS	0	
MEDICATION RELATED	11	
NEW APPOINTMENT	0	
OTHERS	25	
PRIOR AUTHORIZATION	0	
PROVIDER	2	
QUERIES FROM INSURANCE FIRM	2	
QUERIES FROM PHARMACY	0	
QUERY ON CURRENT APPOINTMENT	6	
REFILL	12	
RESCHEDULING	5	
RUNNING LATE TO APPOINTMENT	10	
SHARING OF HEALTH RECORDS (FAX, E-MAIL, ETC.)	21	
SHARING OF LAB RECORDS (FAX, E-MAIL, ETC.)	4	
SYMPTOMS	49	

Prediction	Reference MEDICATION RELATED	NEW APPOINTMENT	OTHERS	PR
CANCELLATION	76	202	49	
CHANGE OF HOSPITAL	31	9	35	
CHANGE OF PHARMACY	0	0	2	
CHANGE OF PROVIDER	155	59	193	
FOLLOW UP ON PREVIOUS REQUEST	46	8	4	
LAB RESULTS	10	2	1	
MEDICATION RELATED	1807	50	30	
NEW APPOINTMENT	6	1404	25	
OTHERS	72	24	1501	
PRIOR AUTHORIZATION	46	0	12	
PROVIDER	94	65	8	
QUERIES FROM INSURANCE FIRM	10	2	31	
QUERIES FROM PHARMACY	32	12	24	
QUERY ON CURRENT APPOINTMENT	272	561	71	
REFILL	169	111	47	
RESCHEDULING	60	191	10	
RUNNING LATE TO APPOINTMENT	91	548	112	
SHARING OF HEALTH RECORDS (FAX, E-MAIL, ETC.)	12	1	145	
SHARING OF LAB RECORDS (FAX, E-MAIL, ETC.)	107	67	38	
SYMPTOMS	437	177	121	

Prediction	Reference PROVIDER	QUERIES FROM INSURANCE FIRM	QUERIES
CANCELLATION	9	1	
CHANGE OF HOSPITAL	2	2	
CHANGE OF PHARMACY	0	0	
CHANGE OF PROVIDER	2	6	
FOLLOW UP ON PREVIOUS REQUEST	11	0	
LAB RESULTS	0	0	
MEDICATION RELATED	19	1	
NEW APPOINTMENT	1	0	
OTHERS	28	3	
PRIOR AUTHORIZATION	11	0	
PROVIDER	404	0	
QUERIES FROM INSURANCE FIRM	2	4	
QUERIES FROM PHARMACY	31	4	
QUERY ON CURRENT APPOINTMENT	4	0	
REFILL	55	1	

RESCHEDULING	0	0
RUNNING LATE TO APPOINTMENT	20	1
SHARING OF HEALTH RECORDS (FAX, E-MAIL, ETC.)	0	8
SHARING OF LAB RECORDS (FAX, E-MAIL, ETC.)	16	2
SYMPTOMS	42	3

Prediction	Reference QUERY ON CURRENT APPOINTMENT	REFILL	RESCHEDU
CANCELLATION	10	37	
CHANGE OF HOSPITAL	0	15	
CHANGE OF PHARMACY	0	0	
CHANGE OF PROVIDER	1	31	
FOLLOW UP ON PREVIOUS REQUEST	0	115	
LAB RESULTS	0	0	
MEDICATION RELATED	6	50	
NEW APPOINTMENT	0	3	
OTHERS	2	52	
PRIOR AUTHORIZATION	0	184	
PROVIDER	1	237	
QUERIES FROM INSURANCE FIRM	0	1	
QUERIES FROM PHARMACY	0	26	
QUERY ON CURRENT APPOINTMENT	122	81	
REFILL	11	2193	
RESCHEDULING	12	2	
RUNNING LATE TO APPOINTMENT	21	58	
SHARING OF HEALTH RECORDS (FAX, E-MAIL, ETC.)	0	2	
SHARING OF LAB RECORDS (FAX, E-MAIL, ETC.)	4	33	
SYMPTOMS	29	153	

Prediction	Reference RUNNING LATE TO APPOINTMENT
CANCELLATION	4
CHANGE OF HOSPITAL	1
CHANGE OF PHARMACY	0
CHANGE OF PROVIDER	2
FOLLOW UP ON PREVIOUS REQUEST	0
LAB RESULTS	0
MEDICATION RELATED	1
NEW APPOINTMENT	2
OTHERS	0
PRIOR AUTHORIZATION	0
PROVIDER	0
QUERIES FROM INSURANCE FIRM	0
QUERIES FROM PHARMACY	0
QUERY ON CURRENT APPOINTMENT	36
REFILL	2
RESCHEDULING	11
RUNNING LATE TO APPOINTMENT	169
SHARING OF HEALTH RECORDS (FAX, E-MAIL, ETC.)	0
SHARING OF LAB RECORDS (FAX, E-MAIL, ETC.)	0
SYMPTOMS	3

Prediction	Reference SHARING OF HEALTH RECORDS (FAX, E-MAIL, ETC.
CANCELLATION	2
CHANGE OF HOSPITAL	2
CHANGE OF PHARMACY	
CHANGE OF PROVIDER	13
FOLLOW UP ON PREVIOUS REQUEST	
LAB RESULTS	
MEDICATION RELATED	2
NEW APPOINTMENT	
OTHERS	12
PRIOR AUTHORIZATION	
PROVIDER	
QUERIES FROM INSURANCE FIRM	1
QUERIES FROM PHARMACY	
QUERY ON CURRENT APPOINTMENT	1
REFILL	4
RESCHEDULING	
RUNNING LATE TO APPOINTMENT	6
SHARING OF HEALTH RECORDS (FAX, E-MAIL, ETC.)	55
SHARING OF LAB RECORDS (FAX, E-MAIL, ETC.)	2
SYMPTOMS	10

Prediction	Reference SHARING OF LAB RECORDS (FAX, E-MAIL, ETC.) S
CANCELLATION	56
CHANGE OF HOSPITAL	1
CHANGE OF PHARMACY	0

```
  CHANGE OF PROVIDER                                                    9
  FOLLOW UP ON PREVIOUS REQUEST                                         5
  LAB RESULTS                                                          23
  MEDICATION RELATED                                                   12
  NEW APPOINTMENT                                                       0
  OTHERS                                                               19
  PRIOR AUTHORIZATION                                                   0
  PROVIDER                                                              3
  QUERIES FROM INSURANCE FIRM                                           1
  QUERIES FROM PHARMACY                                                11
  QUERY ON CURRENT APPOINTMENT                                         18
  REFILL                                                               14
  RESCHEDULING                                                          1
  RUNNING LATE TO APPOINTMENT                                          14
  SHARING OF HEALTH RECORDS (FAX, E-MAIL, ETC.)                         0
  SHARING OF LAB RECORDS (FAX, E-MAIL, ETC.)                          249
  SYMPTOMS                                                             39

Overall Statistics

               Accuracy : 0.5338
                 95% CI : (0.5266, 0.5409)
    No Information Rate : 0.185
    P-Value [Acc > NIR] : < 2.2e-16

                  Kappa : 0.4898
 Mcnemar's Test P-Value : NA

Statistics by Class:

                     Class: CANCELLATION Class: CHANGE OF HOSPITAL Class: CHANGE OF PHARMACY
Sensitivity                     0.502262                 2.000e-02                 0.0000000
Specificity                     0.964286                 9.927e-01                 0.9997903
Pos Pred Value                  0.141401                 7.143e-03                 0.0000000
Neg Pred Value                  0.993992                 9.974e-01                 0.9990570
Prevalence                      0.011575                 2.619e-03                 0.0009428
Detection Rate                  0.005814                 5.238e-05                 0.0000000
Detection Prevalence            0.041115                 7.333e-03                 0.0002095
Balanced Accuracy               0.733274                 5.064e-01                 0.4998952
                     Class: CHANGE OF PROVIDER Class: FOLLOW UP ON PREVIOUS REQUEST Class: L
Sensitivity                         0.506289                              0.369748
Specificity                         0.965965                              0.988669
Pos Pred Value                      0.201250                              0.169884
Neg Pred Value                      0.991417                              0.996018
Prevalence                          0.016655                              0.006233
Detection Rate                      0.008432                              0.002305
Detection Prevalence                0.041900                              0.013565
Balanced Accuracy                   0.736127                              0.679208
                     Class: MEDICATION RELATED Class: NEW APPOINTMENT Class: OTHERS Class: P
Sensitivity                            0.51146                0.40195       0.61041
Specificity                            0.98271                0.99487       0.97385
Pos Pred Value                         0.87042                0.94609       0.77531
Neg Pred Value                         0.89857                0.88137       0.94416
Prevalence                             0.18504                0.18295       0.12879
Detection Rate                         0.09464                0.07353       0.07862
Detection Prevalence                   0.10873                0.07772       0.10140
Balanced Accuracy                      0.74709                0.69841       0.79213
                     Class: PROVIDER Class: QUERIES FROM INSURANCE FIRM Class: QUERIES FROM
Sensitivity                  0.61492                          0.1111111
Specificity                  0.97131                          0.9965367
Pos Pred Value               0.43301                          0.0571429
Neg Pred Value               0.98607                          0.9983178
Prevalence                   0.03441                          0.0018855
Detection Rate               0.02116                          0.0002095
Detection Prevalence         0.04887                          0.0036663
Balanced Accuracy            0.79311                          0.5538239
                     Class: QUERY ON CURRENT APPOINTMENT Class: REFILL Class: RESCHEDULING
Sensitivity                                      0.55708        0.6700            0.332103
Specificity                                      0.93229        0.9580            0.983128
Pos Pred Value                                   0.08714        0.7676            0.365112
Neg Pred Value                                   0.99452        0.9335            0.980538
Prevalence                                       0.01147        0.1714            0.028387
Detection Rate                                   0.00639        0.1149            0.009428
Detection Prevalence                             0.07333        0.1496            0.025821
Balanced Accuracy                                0.74468        0.8140            0.657615
                     Class: RUNNING LATE TO APPOINTMENT Class: SHARING OF HEALTH RECORDS (FA
```

Sensitivity	0.731602
Specificity	0.942212
Pos Pred Value	0.134234
Neg Pred Value	0.996523
Prevalence	0.012099
Detection Rate	0.008851
Detection Prevalence	0.065940
Balanced Accuracy	0.836907

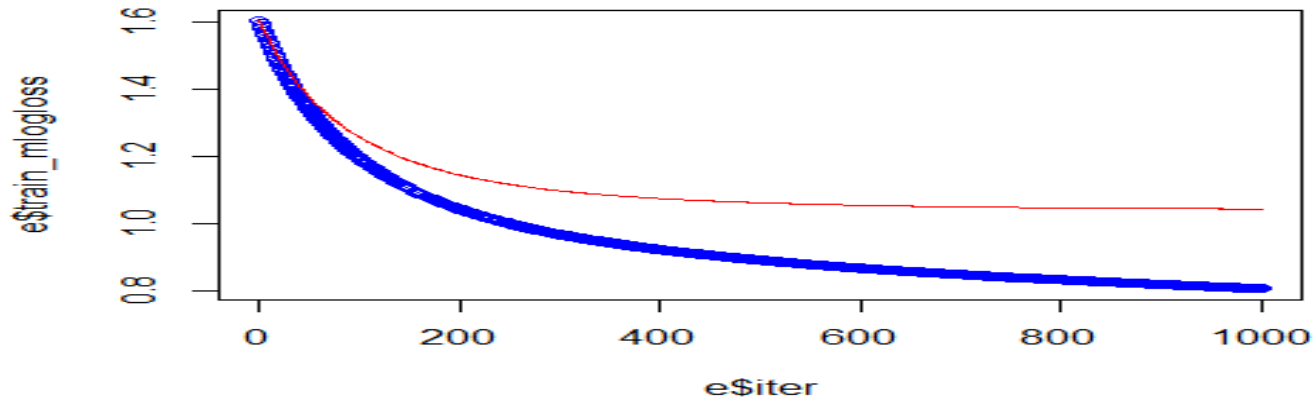
	Class: SHARING OF LAB RECORDS (FAX, E-MAIL, ETC.)	Class: SYMPTOMS
Sensitivity	0.52421	0.69500
Specificity	0.97717	0.92564
Pos Pred Value	0.36944	0.16667
Neg Pred Value	0.98773	0.99300
Prevalence	0.02488	0.02095
Detection Rate	0.01304	0.01456
Detection Prevalence	0.03530	0.08736
Balanced Accuracy	0.75069	0.81032

7.2. Xgboost Model :-

Model was built on training data and tested on test data. Confusion matrix, Accuracy has been checked. We've first Built model to predict Categories then again we've built model to predict sub_categories. We've used CPU's multi-cores to leverage the model with parallelization. We've used "***LabelCount Encoding"*** to convert categorical variab Categories and sub_categories in to numeric variables.
The model is 58.82322% accurate to predict categories.

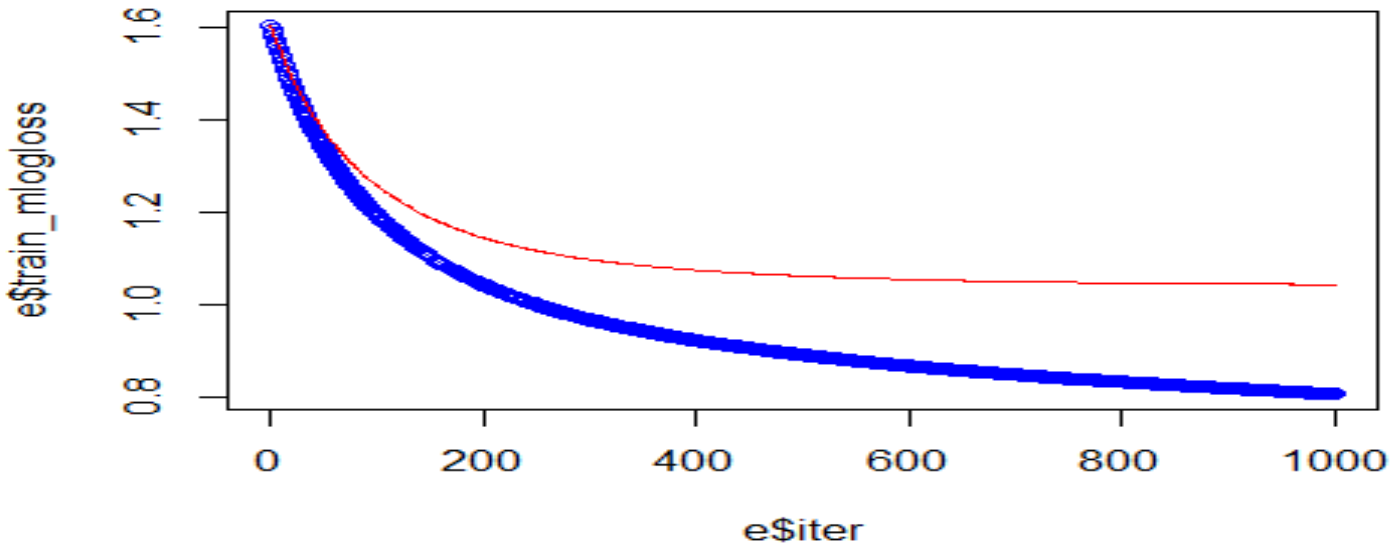
<u>Training and Test error plot for Categories</u>

Training and Test error are plotted for Categories to check if model is overfit.



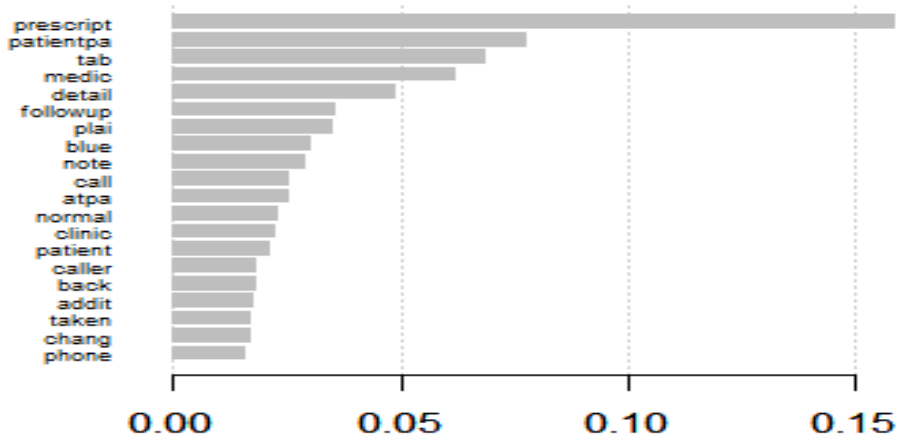
<u>Training and Test error plot for sub_categories:</u>

Training and Test error are plotted for sub_categories to check if model is overfit.



Feature imortance:-

We can plot graph for important features using xgb.importance function .
Here we've plotted graph for 20 important features.



Confusion Matrix for categories:-

Prediction \ Actual	0	1	2	3	4
0	558	65	104	47	28
1	292	2516	641	633	644
2	388	406	2045	676	618
3	323	457	1073	2737	336
4	79	528	383	166	3411

Confusion Matrix for Sub_categories:-

Table here looks quite messy, Please check it in table_subcategories_Xgboost.csv

Prediction \ Actual	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	1	1
2	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	1	0
3	0	0	0	0	0	0	1	0	0	3	1	2	1	1	0	2	2	2	1	1
4	0	0	0	0	1	1	0	3	0	0	2	5	0	1	1	2	2	1	6	8
5	0	0	1	0	0	19	3	1	0	0	0	5	0	1	0	6	9	0	10	4
6	0	0	0	0	2	9	110	0	3	0	3	6	0	2	4	7	12	2	11	8
7	0	0	2	0	0	1	0	11	1	0	4	4	2	5	9	6	6	0	11	14
8	0	0	1	0	4	3	0	7	10	0	5	3	0	3	8	6	8	5	32	55
9	0	0	0	3	1	1	0	0	0	49	2	0	3	4	3	10	10	25	2	26
10	0	0	1	0	1	2	0	2	2	0	58	3	2	15	7	74	17	0	12	9
11	0	0	0	1	5	8	5	8	3	3	5	27	0	8	4	7	21	3	50	15
12	0	5	0	0	1	3	0	4	4	15	21	1	315	28	13	48	86	32	24	45
13	0	3	1	1	3	2	0	34	2	12	29	3	13	167	4	43	49	3	51	20
14	0	0	0	0	12	3	0	13	7	2	74	7	6	13	471	13	39	7	36	69
15	0	4	3	3	7	6	12	20	7	19	83	20	17	51	18	300	141	15	59	81
16	2	15	8	12	18	63	11	53	15	107	98	90	67	117	103	209	1102	91	367	231
17	4	0	1	5	2	5	9	10	9	43	9	12	33	18	7	26	56	2465	45	369
18	0	1	13	4	71	73	64	102	45	42	98	222	15	225	108	177	622	57	1949	332
19	1	7	18	9	55	35	14	149	182	83	125	133	72	167	171	291	322	537	494	2394

7.3. Xgboost Model with Hyper Parameter tuning:-

Model was built on training data and tested on test data. Confusion matrix, Accuracy has been checked. We've first built Xgboost Model to predict Categories and then sub_categories. We've auto-tuned the model to find the best values of Hyper parameters such as nrounds, max_depth, gamma, min_child_weight,

subsample, colsample_bytree. We've used CPU's multicores to leverage the model with parallelization. We've used *"**one hot encoding**"* to convert dependent categorical variables in to numeric variables. The model is 58.40555% accurate to predict categories.

Confusion Matrix for Categories:-

	APPOINTMENTS	ASK_A_DOCTOR	LAB	MISCELLANEOUS	PRESCRIPTION
APPOINTMENTS	2764	613	57	677	148
ASK_A_DOCTOR	465	2470	81	417	539
LAB	316	285	576	381	82
MISCELLANEOUS	1109	613	114	2010	400
PRESCRIPTION	379	669	26	596	3367

Confusion Matrix for Sub_Categories:-

Since Confusion Matrix here look quite messy. Please check it in table_subcategories_Xgboost_tuning.csv file.

	CANCELLATION	CHANGE OF HOSPITAL	CHANGE OF PHARMACY	CHANGE OF PROVIDER	FOLLOW UP ON PREVIOUS REQUEST	LAB RESULTS
CANCELLATION	19	0	0	2	0	2
CHANGE OF HOSPITAL	0	1	0	2	0	1
CHANGE OF PHARMACY	0	1	0	0	0	0
CHANGE OF PROVIDER	1	0	0	11	0	9
FOLLOW UP ON PREVIOUS REQUEST	0	0	0	0	0	0
LAB RESULTS	0	0	0	9	0	483
MEDICATION RELATED	3	0	0	7	3	67
NEW APPOINTMENT	8	1	0	10	1	44
OTHERS	6	0	0	2	0	43
PRIOR AUTHORIZATION	0	1	0	1	2	2
PROVIDER	0	1	0	7	1	10
QUERIES FROM INSURANCE FIRM	0	0	0	0	0	0
QUERIES FROM PHARMACY	0	0	0	1	0	4
QUERY ON CURRENT APPOINTMENT	0	0	0	0	0	11
REFILL	0	0	0	1	0	4
RESCHEDULING	4	0	0	1	1	9
RUNNING LATE TO APPOINTMENT	1	0	0	0	0	0
SHARING OF HEALTH RECORDS (FAX, E-MAIL, ETC.)	2	0	0	5	1	17
SHARING OF LAB RECORDS (FAX, E-MAIL, ETC.)	0	0	0	6	1	84
SYMPTOMS	0	0	0	2	0	11

	MEDICATION RELATED	NEW APPOINTMENT	OTHERS	PRIOR AUTHORIZATION	PROVIDER	QUERIES FROM INSURANCE FIRM	QUERIES FROM PHARMACY
CANCELLATION	35	82	59	0	3	0	5
CHANGE OF HOSPITAL	16	12	10	0	3	0	1
CHANGE OF PHARMACY	1	1	0	0	0	0	0
CHANGE OF PROVIDER	163	115	49	0	32	1	7

FOLLOW UP ON PREVIOUS REQUEST					8	9			
7	2	2	0	1					
LAB RESULTS					184	105			
103	0	3	0	15					
MEDICATION RELATED					2446	335			
241	30	16	1	58					
NEW APPOINTMENT					524	1982			
368	2	61	1	33					
OTHERS					333	670	1		
109	5	41	0	101					
PRIOR AUTHORIZATION					70	43			
118	53	8	0	17					
PROVIDER					153	239			
124	1	197	0	27					
QUERIES FROM INSURANCE FIRM					5	3			
17	0	1	0	6					
QUERIES FROM PHARMACY					61	7			
68	1	5	0	357					
QUERY ON CURRENT APPOINTMENT					66	80			
12	0	1	0	2					
REFILL					512	51			
108	34	2	0	36					
RESCHEDULING					135	256			
92	0	5	0	2					
RUNNING LATE TO APPOINTMENT					14	70			
11	0	0	0	1					
SHARING OF HEALTH RECORDS (FAX, E-MAIL, ETC.)					307	197			
241	4	38	0	56					
SHARING OF LAB RECORDS (FAX, E-MAIL, ETC.)					131	107			
112	2	25	0	31					
SYMPTOMS					188	52			
18	0	1	0	3					

	QUERY ON CURRENT APPOINTMENT	REFILL	RESCHEDULING	RUNNING LATE TO APPOINTMENT	SHARING OF HEALTH RECORDS (FAX, E-MAIL, ETC.)
CANCELLATION	0	5			
6	10	5			
CHANGE OF HOSPITAL	0	1			
0	0	2			
CHANGE OF PHARMACY	0	4			
0	0	0			
CHANGE OF PROVIDER	1	7			
3	1	14			
FOLLOW UP ON PREVIOUS REQUEST	0	7			
0	0	2			
LAB RESULTS	0	6			
0	3	13			
MEDICATION RELATED	0	370			
2	11	68			
NEW APPOINTMENT	0	47			
19	12	41			
OTHERS	0	53			
7	13	113			
PRIOR AUTHORIZATION	0	45			
2	0	16			
PROVIDER	0	19			
1	2	36			
QUERIES FROM INSURANCE FIRM	0	0			
0	0	6			
QUERIES FROM PHARMACY	0	28			
0	0	13			
QUERY ON CURRENT APPOINTMENT	0	2			
1	2	6			
REFILL	1	2483			
2	0	10			
RESCHEDULING	0	9			
17	6	5			
RUNNING LATE TO APPOINTMENT	0	10			
2	115	5			
SHARING OF HEALTH RECORDS (FAX, E-MAIL, ETC.)	0	23			
3	8	269			
SHARING OF LAB RECORDS (FAX, E-MAIL, ETC.)	0	5			
3	4	49			
SYMPTOMS	0	8			
0	0	4			

SHARING OF LAB RECORDS (FAX, E-MAIL, E
TC.) SYMPTOMS
  CANCELLATION
0   1
  CHANGE OF HOSPITAL
0   0
  CHANGE OF PHARMACY
0   0
  CHANGE OF PROVIDER
2   1
  FOLLOW UP ON PREVIOUS REQUEST
0   0
  LAB RESULTS
6   1
  MEDICATION RELATED
9   15
  NEW APPOINTMENT
2   6
  OTHERS
9   2
  PRIOR AUTHORIZATION
0   0
  PROVIDER
12   0
  QUERIES FROM INSURANCE FIRM
0   0
  QUERIES FROM PHARMACY
1   0
  QUERY ON CURRENT APPOINTMENT
0   0
  REFILL
0   1
  RESCHEDULING
0   1
  RUNNING LATE TO APPOINTMENT
0   0
  SHARING OF HEALTH RECORDS (FAX, E-MAIL, ETC.)
55   2
  SHARING OF LAB RECORDS (FAX, E-MAIL, ETC.)
56   1
  SYMPTOMS
0   3