

**Algorithms for Intelligence Web and**  
**Information Retrieval**

**Course Code: UE19CS332**



**Department of Computer Science Engineering**

**PES University**

**WEEK3:**

**SUBJECT: -POSITIONAL INDEX(WITH ALL  
OPERATION)**

**TEAM NUMBER: 18 TEAM**

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**CODE:**

We are imported the libraries to work

```

week2modified.py > ...
1  #-----IMPORTING THE LIBRARIES-----
2  import numpy as np
3  import os
4  import nltk
5  from nltk.stem import PorterStemmer
6  from nltk.tokenize import TweetTokenizer
7  from natsort import natsorted
8  import string

```

We first read the documents /dataset and implemented with the header and footer function

```

#-----READING THE CONTENTS OF FILE-----
def read_file(filename):
    with open(filename, 'r', encoding="ascii") as f:
        stuff = f.read()
    f.close()
    stuff = remove_header_footer(stuff)
    return stuff

```

We just removed the stopwords , punctuations ,and we converted to all upper case letter to lower letter .

```

#-----PREPROCESSING LIKE REMOVAL OF PUNCTUATION,STOPWORDS ETC-----
def preprocessing(final_string):
    tokenizer = TweetTokenizer()
    token_list = tokenizer.tokenize(final_string)

    # Remove punctuations.
    table = str.maketrans('', '', '\t')
    token_list = [word.translate(table) for word in token_list]
    punctuations = (string.punctuation).replace("'", "")
    trans_table = str.maketrans('', '', punctuations)
    stripped_words = [word.translate(trans_table) for word in token_list]
    token_list = [str for str in stripped_words if str]

    # Change to lowercase.
    token_list = [word.lower() for word in token_list]
    return token_list

```

This function helpful for Positional index here calculation

```
#-----CALCULATING THE POSITIONAL INDEX OF A TERM IN FOLDERS-----
folder_names = ["soc.religion.christian"]
stemmer = PorterStemmer()
pos_index = {}
file_map = {}
for folder_name in folder_names:
    file_names = natsorted(os.listdir("20_newsgroups/" + folder_name))

    for fileno, file_name in enumerate(file_names):
        stuff = read_file("20_newsgroups/" + folder_name + "/" + file_name)
        final_token_list = preprocessing(stuff)
        # For position and term in the tokens.
        for pos, term in enumerate(final_token_list):
            term = stemmer.stem(term)
            # If term already exists in the positional index dictionary.
            if term in pos_index:
                # Increment total freq by 1.
                pos_index[term][0] = pos_index[term][0] + 1
                # Check if the term has existed in that DocID before.
                if fileno in pos_index[term][1]:
                    pos_index[term][1][fileno].append(pos)
            else:
                # If term does not exist in the positional index dictionary
                # (first encounter).
                # Initialize the list.
                pos_index[term] = []
                # The total frequency is 1.
                pos_index[term].append(1)
                # The postings list is initially empty.
                pos_index[term].append({})
                # Add doc ID to postings list.
                pos_index[term][1][fileno] = [pos]

        # Map the file no. to the file name.
        file_map[fileno] = "20_newsgroups/" + folder_name + "/" + file_name

    # Increment the file no. counter for document ID mapping
    fileno += 1
```

```
#-----PRINTING A POSITIONAL INDEX OF A TERM-----
sample_pos_idx = pos_index["christian"]
print("Positional Index")
print(sample_pos_idx)
```

```
#-----PRINTING THE FILE PATH AND RESPECTIVE POSITION OF THE OCCURANCE OF THE TERM-----
file_list = sample_pos_idx[1]
print("Filename, [Positions]")
for fileno, positions in file_list.items():
    print(file_map[fileno], positions)
```

## OUTPUT:

```
PS C:\Users\Kuntal Gorai\OneDrive - PESUNIVERSITY\6th Semester\Algorithm for Web Infromation and Information Retrival\Week2> py
thon3 week2.py
Positional Index
[1415, {2: [71, 95, 105], 10: [13], 15: [65], 16: [85], 18: [15], 20: [34, 64], 23: [151], 24: [106, 247, 257, 277, 289, 311, 3
16, 417, 468], 27: [13, 18, 31, 60, 73, 118, 146, 277, 300, 691], 28: [114], 29: [161, 199, 227, 241, 277, 293, 319, 326, 411],
30: [66, 215, 222], 34: [22, 63], 35: [49, 60, 85, 187, 204, 218], 36: [107, 128], 38: [214, 256, 397, 682, 697, 718], 40: [69
```

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, 697, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 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