BUSINESS CONCERN

Question 3

What were the top Australian news topics over the last decade, and what can these say about the national conversation?

Significance

The question topic describes to answer two main questions using the data

- -> To identify the top australian news topics over the last decade
- -> To understand the national conversation based on the top news topics

KEY STAKEHOLDERS

- 1) community defines as the general public who are interseted in news
- 2) News Media
- 3) Australian News Organisation
- 4) Australian Press Council

APPROACH

- 1) To address this bunissness concern the data is collected from kaggle and loaded.
- 2) Ater collection of data. the data is exmanined so that the data collected is relavant as per the question requirement.
- 3) selecting the data of the last decade and examining the data again and adress the issue of any null values
- 4) Converting the upper case letter to lower case.
- 5) Tokenizing is usefull in splitting up a large body of into small text. the tokenizing method is used to because the data contains a large number of text and will help in selecting smaller lines of text for processing
- 6) Implementing porter stemmer technique for processing the text as part of text analysis.
- 7) removing the stopword form the stemmed words.
- 8) rejoing the words.
- 9) selecting the date in order display the data of the last decade.
- 10) Displaying the top 20 most occurning news topics.
- 11) Implementing TF-IDF and LDA method for identifying term frequency and probabilistic topic modeling.
- 12) The visualization of data is applied using wordcloud to identify the top topics in from the dataframe.

LIBRARIES

The worldcloud is used to represent the frequency or the importance of every word in the abc news dataset. furthermore, the nltk is used to create a break the text into small chucnk of information in the form of words and sentences, pandas and numpy libararies are used because stuctures and data analysis tools, whereas, numpy enables objects for multi-dimensional arryas and pandas provide a table called dataframe, the gensim library is implemented because it will enable us to use latent dirichelt allocation (LDA) which does topic modelling.

```
#install Pakaaes
  !pip install wordcloud
!pip install nltk
  import sys
  !{sys.executable} -m pip install gensim
  #import Libraries
 import pandas as pd
import numpy as np
import gensim
 import nltk
 import re
nltk.download('stopwords')
 #for Visualisation
from wordcloud import WordCloud
import matplotlib.pyplot as plt
from nltk.corpus import stopwords
  #ANALYSIS
 from gensim.models import TfidfModel
from gensim.corpora import Dictionary
from gensim.utils import tokenize
from gensim.utils import simple_preprocess
 from gensim.corpora.textcorpus import remove_stopwords
from gensim.summarization import keywords
from gensim.models.ldamodel import LdaModel
 import pyLDAvis
import pyLDAvis.gensim
import pandas as pd
Requirement already satisfied: wordcloud in c:\users\karth\anaconda3\lib\site-packages (1.6.0)
Requirement already satisfied: wordcloud in c:\users\karth\anaconda3\\in\site-packages (1.0.0)
Requirement already satisfied: matplotlib in c:\users\karth\anaconda3\lib\site-packages (from wordcloud) (3.1.0)
Requirement already satisfied: numpy>=1.6.1 in c:\users\karth\anaconda3\lib\site-packages (from wordcloud) (1.16.4)
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Requirement already satisfied: python-dateutil>=2.1 in c:\users\karth\anaconda3\\tib\site-packages (from matplotlib->wordcloud) (2.8.0)
Requirement already satisfied: six in c:\users\karth\anaconda3\\tib\site-packages (from cycler>=0.10->matplotlib->wordcloud) (1.12.0)
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Requirement already satisfied: gensim in c:\users\karth\anaconda3\tib\site-packages (3.8.2)

Requirement already satisfied: mart-open>=1.8.1 in c:\users\karth\anaconda3\tib\site-packages (from gensim) (2.0.0)

Requirement already satisfied: scipy>=1.0.0 in c:\users\karth\anaconda3\tib\site-packages (from gensim) (1.2.1)

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Requirement already satisfied: six>=1.5.0 in c:\users\karth\anaconda3\lib\site-packages (from gensim) (1.12.0)
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Requirement already satisfied: idna<2.9,>=2.5 in c:\users\karth\anaconda3\tib\site-packages (from requests->smart-open>=1.8.1->gensim) (2.8)
Requirement already satisfied: urllib3!=1.25.0,!=1.25.1,<1.26,>=1.21.1 in c:\users\karth\anaconda3\tib\site-packages (from requests->smart-open>=1.8.1->gensim
     (1.24.2)
  Requirement already satisfied: botocore<1.16.0,>=1.15.49 in c:\users\karth\anaconda3\lib\site-packages (from boto3->smart-open>=1.8.1->gensim) (1.15.49)
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Requirement already satisfied: jmespath<1.0.0,>=0.7.1 in c:\users\karth\anaconda3\lib\site-packages (from boto3->smart-open>=1.8.1->gensim) (0.9.5)

Requirement already satisfied: docutils<0.16,>=0.10 in c:\users\karth\anaconda3\lib\site-packages (from botocore<1.16.0,>=1.15.49->boto3->smart-open>=1.8.1->gensim) (0.9.5)
 ensim) (0.14)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in c:\users\karth\anaconda3\lib\site-packages (from botocore<1.16.0,>=1.15.49->boto3->smart-open>=1
.8.1->gensim) (2.8.0)
```

LOADING THE DATA

The data for analysis is first loaded into juypter notebook, here the abcnews data is loaded by creating a file and the loading the file into the dataframe. the later calling the dataframe in order display the information present in abcnews dataset.

```
In [4]:
```

```
file = "C:/Users/karth/Assignment 1 Part B/Question 3/abcnews-date-text.csv"
#load the data into pandas data frame
abc_df = pd.read_csv(file)
```

DATA EXAMINATION

Firstly i need check the overall shape and the layout of my dataset.

```
In [5]:
```

```
num_rows = abc_df.shape[0]
num_cols = abc_df.shape[1]
print("There are %d rows and %d cols in the dataset abc_news" %(num_rows, num_cols))
```

There are 1186018 rows and 2 cols in the dataset abc_news

Using the head function displayed the first n rows. this was usefull because it provided me with the nessassary information about the type of data the it was holding

```
In [6]:
```

```
abc_df.head()
```

Out[6]:

	publish_date	headline_text
0	20030219	aba decides against community broadcasting lic
1	20030219	act fire witnesses must be aware of defamation
2	20030219	a g calls for infrastructure protection summit
3	20030219	air nz staff in aust strike for pay rise
4	20030219	air nz strike to affect australian travellers

To check wheather the dataset contains any null values i have used isnull.

In [7]:

```
abc_df.isnull().sum()
```

Out[7]:

publish_date 0
headline_text 0
dtype: int64

Although using previous fuction we can see the variables of the columns. since we are doing a detailed analysis we need to check the colomn varibles hence the below fucction is used.

In [8]:

```
vars = abc_df.columns.tolist()
vars
```

Out[8]:

['publish_date', 'headline_text']

Since the question is focusing on the top conversation in australia over the last decade, we need to understand which were the most words and by doing this we can understand wheather those words can affect any news conversation. as displayed below in the output most of the words are irrerralvant and provide little information about the conversation.

In [10]:

```
Num_Word = pd.Series(''.join(abc_df.headline_text).split()).value_counts()
Num_Word
```

Out[10]:

to	225789
in	144052
for	135887
of	87674
on	76156
over	51432
the	47618
at	33712
with	33035
after	31893
and	26463
a	25203
as	22373
from	20689
new	19706
by	19520
up	17762
says	17742
be	16698
out	16210
police	14390
not	14297
into	11618
more	11061
against	10688
court	10682
man	10503
charged	10418
back	9440
off	9316
	• • •
tagsouthern	1
keoghchamber	1
recordscross	1
delaybusiness	1
brawltonic	1
rulingorganisers	1
toldtafe solutionopposition	1
offencesmauritania	1
usechinese	1
inkidnapped	1
demolitionhotel	1
crashshalala	1
cancerpacific	1
contractmildura	1
campvictorian	1
correspondentinvestigator	1
seatingnew	1
violence250k	1
southtough	1
pngskeletal	1
upiranian	1
approachaid	1
visaspapuans	1
coupsprout	1
joburgwa	1
weekcase	1
spotsubstance	1
devilsleaders	1
petrovskijuvenile	1
Length: 1043310, dtype: int64	

DATA PROCESSING

I have converted the information present in headline_text to lower case becuase when i will be creating corpus in english. the model could treat capital letter differently which are starting from the begining of sentence thus, resulting in uneven analysis.

```
abc_df['headline_text'] = abc_df['headline_text'].str.lower()
abc_df
```

Out[11]:

	publish_date	headline_text
0	20030219	aba decides against community broadcasting lic
1	20030219	act fire witnesses must be aware of defamation
2	20030219	a g calls for infrastructure protection summit
3	20030219	air nz staff in aust strike for pay rise
4	20030219	air nz strike to affect australian travellers
5	20030219	ambitious olsson wins triple jump
6	20030219	antic delighted with record breaking barca
7	20030219	aussie qualifier stosur wastes four memphis match
8	20030219	aust addresses un security council over iraq
9	20030219	australia is locked into war timetable opp
10	20030219	australia to contribute 10 million in aid to iraq
11	20030219	barca take record as robson celebrates birthda
12	20030219	bathhouse plans move ahead
13	20030219	big hopes for launceston cycling championship
14	20030219	big plan to boost paroo water supplies
15	20030219	blizzard buries united states in bills
16	20030219	brigadier dismisses reports troops harassed in
17	20030219	british combat troops arriving daily in kuwait
18	20030219	bryant leads lakers to double overtime win
19	20030219	bushfire victims urged to see centrelink
20	20030219	businesses should prepare for terrorist attacks
21	20030219	calleri avenges final defeat to eliminate massu
22	20030219	call for ethanol blend fuel to go ahead
23	20030219	carews freak goal leaves roma in ruins
24	20030219	cemeteries miss out on funds
25	20030219	code of conduct toughens organ donation regula
26	20030219	commonwealth bank cuts fixed home loan rates
27	20030219	community urged to help homeless youth
28	20030219	council chief executive fails to secure position
29	20030219	councillor to contest wollongong as independent
1185988	20191231	nsw bushfires cobargo fire destroys towns main
1185989	20191231	nsw south coast fires rfs emergency warnings
1185990	20191231	numerous structures burnt in clifton creek vic
1185991	20191231	properties and livestock lost following bushfi
1185992	20191231	relax australian kids are doing just fine
1185993	20191231	rfs volunteer firefighter dies in truck rollover
1185994	20191231	risky decision nearly cost ian munro his life
1185995	20191231	royal darwin hospital emergency medicine director
1185996	20191231	royal darwin hospital medicine director decrie
1185997	20191231	rural wach livestock handling cup
1185998	20191231	scott morrison offers deepest sympathies after
1185999	20191231	sudan sentences 29 intelligence agents to deat
1186000	20191231	sydney family flees through the bush after fir
1186001	20191231	sydney new years eve fireworks be replaced by
1186003	20191231	tasmania new years eve guide 2019 the cop and the criminal mental health ptsd co
1186004	20191231	the fire is engulfing the house: tracey corbin
1186005	20191231	these are the top stories of 2019 as decided b
1186006	20191231	the year that was 2019 highlights memorable po
1186007	20191231	thousands of residents on standby at mallacoot
1186008	20191231	top stories on abc news
1186009	20191231	up to 4000 people are seeking refuge on a beac
1186010	20191231	victoria bushfire mallacoota residents emergency
1186011	20191231	victoria bushfire trapping people in east gipp
1186012	20191231	victorian bushfire emergency mallacoota gippsl
1186013	20191231	vision of flames approaching corryong in victoria
1186014	20191231	wa police and government backflip on drug amne
1186015	20191231	we have fears for their safety: victorian premier
1186016	20191231	we have leafs for their safety. Victorian prefiner
1186017	20191231	yarraville shooting woman dead man critically
		, sala man onloany

1186018 rows × 2 columns

During this stage of processing i want look only at the contents provided in the first row to understand how the headlines might look like.

```
In [12]:
```

```
news_example = abc_df.iloc[0]
print(news_example['headline_text'])
```

aba decides against community broadcasting licence

TOKENIZATION

The word tokenize method is implemented from nltk to split the news data into in single set of words. first it is used for only one of the sentence is the news dataset because to check wheater it is fuctioning properly. afterwards, in the below line of the code the word tokenization is applied to all the sentences in the dataset and also makes a new column called words in the dataframe. the use "isalnum" will allow us to keep the numbers form the dataset as well.

```
In [13]:
```

```
print (nltk.word_tokenize(news_example['headline_text']))
['aba', 'decides', 'against', 'community', 'broadcasting', 'licence']

In [14]:

def identify_tokens(row):
    news = row['headline_text']
    tokens = nltk.word_tokenize(news)
    # taken only words (not punctuation)
    token_words = [w for w in tokens if w.isalnum()]
    return token_words

abc_df['words'] = abc_df.apply(identify_tokens, axis=1)
```

In [15]:

abc_df

Out[15]:

	publish_date	headline_text	words
0	20030219	aba decides against community broadcasting lic	[aba, decides, against, community, broadcastin
1	20030219	act fire witnesses must be aware of defamation	[act, fire, witnesses, must, be, aware, of, de
2	20030219	a g calls for infrastructure protection summit	[a, g, calls, for, infrastructure, protection,
3	20030219	air nz staff in aust strike for pay rise	[air, nz, staff, in, aust, strike, for, pay, r
4	20030219	air nz strike to affect australian travellers	[air, nz, strike, to, affect, australian, trav
5	20030219	ambitious olsson wins triple jump	[ambitious, olsson, wins, triple, jump]
6	20030219	antic delighted with record breaking barca	[antic, delighted, with, record, breaking, barca]
7	20030219	aussie qualifier stosur wastes four memphis match	[aussie, qualifier, stosur, wastes, four, memp
8	20030219	aust addresses un security council over iraq	[aust, addresses, un, security, council, over,
9	20030219	australia is locked into war timetable opp	[australia, is, locked, into, war, timetable,
10	20030219	australia to contribute 10 million in aid to iraq	[australia, to, contribute, 10, million, in, a
11	20030219	barca take record as robson celebrates birthda	[barca, take, record, as, robson, celebrates,
12	20030219	bathhouse plans move ahead	[bathhouse, plans, move, ahead]
13	20030219	big hopes for launceston cycling championship	[big, hopes, for, launceston, cycling, champio
14	20030219	big plan to boost paroo water supplies	[big, plan, to, boost, paroo, water, supplies]
15	20030219	blizzard buries united states in bills	[blizzard, buries, united, states, in, bills]
16	20030219	brigadier dismisses reports troops harassed in	[brigadier, dismisses, reports, troops, harass
17	20030219	british combat troops arriving daily in kuwait	[british, combat, troops, arriving, daily, in,
18	20030219	bryant leads lakers to double overtime win	[bryant, leads, lakers, to, double, overtime, \dots
19	20030219	bushfire victims urged to see centrelink	[bushfire, victims, urged, to, see, centrelink]
20	20030219	businesses should prepare for terrorist attacks	[businesses, should, prepare, for, terrorist, \dots
21	20030219	calleri avenges final defeat to eliminate massu	[calleri, avenges, final, defeat, to, eliminat
22	20030219	call for ethanol blend fuel to go ahead	[call, for, ethanol, blend, fuel, to, go, ahead]
23	20030219	carews freak goal leaves roma in ruins	[carews, freak, goal, leaves, roma, in, ruins]
24	20030219	cemeteries miss out on funds	[cemeteries, miss, out, on, funds]
25	20030219	code of conduct toughens organ donation regula	[code, of, conduct, toughens, organ, donation,
26	20030219	commonwealth bank cuts fixed home loan rates	[commonwealth, bank, cuts, fixed, home, loan,
27	20030219	community urged to help homeless youth	[community, urged, to, help, homeless, youth]
28	20030219	council chief executive fails to secure position	[council, chief, executive, fails, to, secure,
29	20030219	councillor to contest wollongong as independent	[councillor, to, contest, wollongong, as, inde
1185988	20191231	nsw bushfires cobargo fire destroys towns main	[nsw, bushfires, cobargo, fire, destroys, town
1185989	20191231	nsw south coast fires rfs emergency warnings	[nsw, south, coast, fires, rfs, emergency, war
1185990	20191231	numerous structures burnt in clifton creek vic	[numerous, structures, burnt, in, clifton, cre
1185991	20191231	properties and livestock lost following bushfi	[properties, and, livestock, lost, following, \dots
1185992	20191231	relax australian kids are doing just fine	[relax, australian, kids, are, doing, just, fine]
1185993	20191231	rfs volunteer firefighter dies in truck rollover	[rfs, volunteer, firefighter, dies, in, truck,
1185994	20191231	risky decision nearly cost ian munro his life	[risky, decision, nearly, cost, ian, munro, hi
1185995	20191231	royal darwin hospital emergency medicine director	[royal, darwin, hospital, emergency, medicine,
1185996	20191231	royal darwin hospital medicine director decrie	[royal, darwin, hospital, medicine, director,
1185997	20191231	rural wach livestock handling cup	[rural, wach, livestock, handling, cup]
1185998	20191231	scott morrison offers deepest sympathies after	[scott, morrison, offers, deepest, sympathies,
1185999	20191231	sudan sentences 29 intelligence agents to deat	[sudan, sentences, 29, intelligence, agents, t
1186000	20191231	sydney family flees through the bush after fir	[sydney, family, flees, through, the, bush, af
1186001	20191231	sydney new years eve fireworks be replaced by	[sydney, new, years, eve, fireworks, be, repla
1186002	20191231	tasmania new years eve guide 2019	[tasmania, new, years, eve, guide, 2019]
1186003	20191231	the cop and the criminal mental health ptsd co	[the, cop, and, the, criminal, mental, health,
1186004	20191231	the fire is engulfing the house: tracey corbin	[the, fire, is, engulfing, the, house, tracey,
1186005	20191231	these are the top stories of 2019 as decided b	[these, are, the, top, stories, of, 2019, as,
1186006	20191231	the year that was 2019 highlights memorable po	[the, year, that, was, 2019, highlights, memor
1186007	20191231	thousands of residents on standby at mallacoot	[thousands, of, residents, on, standby, at, ma
1186008	20191231	top stories on abc news	[top, stories, on, abc, news]
1186009	20191231	up to 4000 people are seeking refuge on a beac	[up, to, 4000, people, are, seeking, refuge, o
1186010	20191231	victoria bushfire mallacoota residents emergency	[victoria, bushfire, mallacoota, residents, em
1186011	20191231	victoria bushfire trapping people in east gipp	[victoria, bushfire, trapping, people, in, eas
1186012	20191231	victorian bushfire emergency mallacoota gippsl	[victorian, bushfire, emergency, mallacoota, g
1186013	20191231	vision of flames approaching corryong in victoria	[vision, of, flames, approaching, corryong, in
1186014	20191231	wa police and government backflip on drug amne	[wa, police, and, government, backflip, on, dr
1186015	20191231	we have fears for their safety: victorian premier	[we, have, fears, for, their, safety, victoria
1186016	20191231	when do the 20s start	[when, do, the, 20s, start]
			, , , , ,
1186017	20191231	yarraville shooting woman dead man critically	[yarraville, shooting, woman, dead, man, criti

STEMMING

The process of stemming is used to because it reduces the related words to a common stem and is nessassary in order to test the accuracy. Porter stemmer is used because it will enable in removing the inflexional endings and morophological words in english and is necessary for normalizing the process of terms. and it will help in further processing of the data set analysis.

PORTER STEMMER

Firstly we are cheking for the first sentence in the data by creating a list of words and applying stemming process to the list of words. futher, the porter stemmer is applied to whole dataset and creating the new column named "stemmed_words" and then displaying in the output.

In [17]:

```
from nltk.stem import PorterStemmer
stemming = PorterStemmer()
news_list = ['aba', 'decides', 'against', 'community', 'broadcasting', 'licence']
# Using a Python list comprehension method to apply to all words in my_list
print ([stemming.stem(word) for word in news_list])

['aba', 'decid', 'against', 'commun', 'broadcast', 'licenc']

In [18]:

def stem_list(row):
    news_list = row['words']
    stemmed_list = [stemming.stem(word) for word in news_list]
    return (stemmed_list)

abc_df['stemmed_words'] = abc_df.apply(stem_list, axis=1)
```

Out[19]:

	publish_date	headline_text	words	stemmed_words
0	20030219	aba decides against community broadcasting lic	[aba, decides, against, community, broadcastin	[aba, decid, against, commun, broadcast, licenc]
1	20030219	act fire witnesses must be aware of defamation	[act, fire, witnesses, must, be, aware, of, de	[act, fire, wit, must, be, awar, of, defam]
2	20030219	a g calls for infrastructure protection summit	[a, g, calls, for, infrastructure, protection,	[a, g, call, for, infrastructur, protect, summit]
3	20030219	air nz staff in aust strike for pay rise	[air, nz, staff, in, aust, strike, for, pay, r	[air, nz, staff, in, aust, strike, for, pay, r
4	20030219	air nz strike to affect australian travellers	[air, nz, strike, to, affect, australian, trav	[air, nz, strike, to, affect, australian, travel]
5	20030219	ambitious olsson wins triple jump	[ambitious, olsson, wins, triple, jump]	[ambiti, olsson, win, tripl, jump]
6	20030219	antic delighted with record breaking barca	[antic, delighted, with, record, breaking, barca]	[antic, delight, with, record, break, barca]
7	20030219	aussie qualifier stosur wastes four memphis match	[aussie, qualifier, stosur, wastes, four, memp	[aussi, qualifi, stosur, wast, four, memphi, m
8	20030219	aust addresses un security council over iraq	[aust, addresses, un, security, council, over,	[aust, address, un, secur, council, over, iraq]
9	20030219	australia is locked into war timetable opp	[australia, is, locked, into, war, timetable,	[australia, is, lock, into, war, timet, opp]
10	20030219	australia to contribute 10 million in aid to iraq	[australia, to, contribute, 10, million, in, a	[australia, to, contribut, 10, million, in, ai
11	20030219	barca take record as robson celebrates birthda	$[barca, take, record, as, robson, celebrates, \dots$	[barca, take, record, as, robson, celebr, birt
12	20030219	bathhouse plans move ahead	[bathhouse, plans, move, ahead]	[bathhous, plan, move, ahead]
13	20030219	big hopes for launceston cycling championship	[big, hopes, for, launceston, cycling, champio	[big, hope, for, launceston, cycl, championship]
14	20030219	big plan to boost paroo water supplies	[big, plan, to, boost, paroo, water, supplies]	[big, plan, to, boost, paroo, water, suppli]
15	20030219	blizzard buries united states in bills	[blizzard, buries, united, states, in, bills]	[blizzard, buri, unit, state, in, bill]
16	20030219	brigadier dismisses reports troops harassed in	[brigadier, dismisses, reports, troops, harass	[brigadi, dismiss, report, troop, harass, in]
17	20030219	british combat troops arriving daily in kuwait	[british, combat, troops, arriving, daily, in,	[british, combat, troop, arriv, daili, in, kuw
18	20030219	bryant leads lakers to double overtime win	[bryant, leads, lakers, to, double, overtime,	[bryant, lead, laker, to, doubl, overtim, win]
19	20030219	bushfire victims urged to see centrelink	[bushfire, victims, urged, to, see, centrelink]	[bushfir, victim, urg, to, see, centrelink]
20	20030219	businesses should prepare for terrorist attacks	[businesses, should, prepare, for, terrorist,	[busi, should, prepar, for, terrorist, attack]
21	20030219	calleri avenges final defeat to eliminate massu	[calleri, avenges, final, defeat, to, eliminat	[calleri, aveng, final, defeat, to, elimin, ma
22	20030219	call for ethanol blend fuel to go ahead	[call, for, ethanol, blend, fuel, to, go, ahead]	[call, for, ethanol, blend, fuel, to, go, ahead]
23	20030219	carews freak goal leaves roma in ruins	[carews, freak, goal, leaves, roma, in, ruins]	[carew, freak, goal, leav, roma, in, ruin]
24	20030219	cemeteries miss out on funds	[cemeteries, miss, out, on, funds]	[cemeteri, miss, out, on, fund]
25	20030219	code of conduct toughens organ donation regula	[code, of, conduct, toughens, organ, donation,	[code, of, conduct, toughen, organ, donat, regul]
26	20030219	commonwealth bank cuts fixed home loan rates	[commonwealth, bank, cuts, fixed, home, loan,	[commonwealth, bank, cut, fix, home, loan, rate]
27	20030219	community urged to help homeless youth	[community, urged, to, help, homeless, youth]	[commun, urg, to, help, homeless, youth]
28	20030219	council chief executive fails to secure position	[council, chief, executive, fails, to, secure,	[council, chief, execut, fail, to, secur, posit]
29	20030219	councillor to contest wollongong as independent	[councillor, to, contest, wollongong, as, inde	[councillor, to, contest, wollongong, as, inde
1185988	20191231	nsw bushfires cobargo fire destroys towns main	[nsw, bushfires, cobargo, fire, destroys, town	[nsw, bushfir, cobargo, fire, destroy, town, m
1185989 1185990	20191231	nsw south coast fires rfs emergency warnings	[nsw, south, coast, fires, rfs, emergency, war	[nsw, south, coast, fire, rf, emerg, warn]
1185990	20191231	numerous structures burnt in clifton creek vic	[numerous, structures, burnt, in, clifton, cre	[numer, structur, burnt, in, clifton, creek, v
1185992	20191231	properties and livestock lost following bushfi relax australian kids are doing just fine	[properties, and, livestock, lost, following, [relax, australian, kids, are, doing, just, fine]	[properti, and, livestock, lost, follow, bushf [relax, australian, kid, are, do, just, fine]
1185993	20191231	rfs volunteer firefighter dies in truck rollover	[rfs, volunteer, firefighter, dies, in, truck,	[rf, volunt, firefight, die, in, truck, rollov]
1185994	20191231	risky decision nearly cost ian munro his life	[risky, decision, nearly, cost, ian, munro, hi	[riski, decis, nearli, cost, ian, munro, hi, l
1185995	20191231	royal darwin hospital emergency medicine director	[royal, darwin, hospital, emergency, medicine,	[royal, darwin, hospit, emerg, medicin, director]
1185996	20191231	royal darwin hospital medicine director decrie	[royal, darwin, hospital, medicine, director,	[royal, darwin, hospit, medicin, director, dec
1185997	20191231	rural wach livestock handling cup	[rural, wach, livestock, handling, cup]	[rural, wach, livestock, handl, cup]
1185998	20191231	scott morrison offers deepest sympathies after	[scott, morrison, offers, deepest, sympathies,	[scott, morrison, offer, deepest, sympathi, af
1185999	20191231	sudan sentences 29 intelligence agents to deat	[sudan, sentences, 29, intelligence, agents, t	[sudan, sentenc, 29, intellig, agent, to, deat
1186000	20191231	sydney family flees through the bush after fir	[sydney, family, flees, through, the, bush, af	[sydney, famili, flee, through, the, bush, aft
1186001	20191231	sydney new years eve fireworks be replaced by	[sydney, new, years, eve, fireworks, be, repla	[sydney, new, year, eve, firework, be, replac,
1186002	20191231	tasmania new years eve guide 2019	[tasmania, new, years, eve, guide, 2019]	[tasmania, new, year, eve, guid, 2019]
1186003	20191231	the cop and the criminal mental health ptsd co	[the, cop, and, the, criminal, mental, health,	[the, cop, and, the, crimin, mental, health, p
1186004	20191231	the fire is engulfing the house: tracey corbin	[the, fire, is, engulfing, the, house, tracey,	[the, fire, is, engulf, the, hous, tracey, cor
1186005	20191231	these are the top stories of 2019 as decided b	[these, are, the, top, stories, of, 2019, as,	[these, are, the, top, stori, of, 2019, as, de
1186006	20191231	the year that was 2019 highlights memorable po	[the, year, that, was, 2019, highlights, memor	[the, year, that, wa, 2019, highlight, memor,
1186007	20191231	thousands of residents on standby at mallacoot	[thousands, of, residents, on, standby, at, ma	[thousand, of, resid, on, standbi, at, mallaco
1186008	20191231	top stories on abc news	[top, stories, on, abc, news]	[top, stori, on, abc, news]
1186009	20191231	up to 4000 people are seeking refuge on a beac	[up, to, 4000, people, are, seeking, refuge, o	[up, to, 4000, peopl, are, seek, refug, on, a,
1186010	20191231	victoria bushfire mallacoota residents emergency	[victoria, bushfire, mallacoota, residents, em	[victoria, bushfir, mallacoota, resid, emerg]
1186011	20191231	victoria bushfire trapping people in east gipp	[victoria, bushfire, trapping, people, in, eas	[victoria, bushfir, trap, peopl, in, east, gip
1186012	20191231	victorian bushfire emergency mallacoota gippsl	[victorian, bushfire, emergency, mallacoota, g	[victorian, bushfir, emerg, mallacoota, gippsl
1186013	20191231	vision of flames approaching corryong in victoria	[vision, of, flames, approaching, corryong, in	[vision, of, flame, approach, corryong, in, vi
1186014	20191231	wa police and government backflip on drug amne $% \label{eq:controlled}$	[wa, police, and, government, backflip, on, dr	[wa, polic, and, govern, backflip, on, drug, a
1186015	20191231	we have fears for their safety: victorian premier	[we, have, fears, for, their, safety, victoria	[we, have, fear, for, their, safeti, victorian
1186016	20191231	when do the 20s start	[when, do, the, 20s, start]	[when, do, the, 20, start]
1186017	20191231	yarraville shooting woman dead man critically	[yarraville, shooting, woman, dead, man, criti	[yarravil, shoot, woman, dead, man, critic, in

1186018 rows × 4 columns

REMOVING OF STOP WORDS

During the process of examing the data we came across some the words such as "to" "in" etc, which are considered to be stopwords. it is essential to remove such words for the data set because there contribution seems to be very limited in order to understand the conversation of the news dataset.hence, i have defined the fuction and applied it to our dataframe. then i have created the set of words and called "stop_words". because creating set will be faster in removal of stop words.

```
In [20]:
```

```
stop_word = set(stopwords.words("english"))

def remove_stops(row):
    my_list = row['stemmed_words']
    meaningful_words = [w for w in my_list if not w in stop_word]
    return (meaningful_words)

abc_df['processed_stem'] = abc_df.apply(remove_stops, axis=1)
```

In [21]:

abc_df
Out[21]:

processed_stem	stemmed_words	words	headline_text	publish_date	
[aba, decid, commun, broadcast, licence	[aba, decid, against, commun, broadcast, licenc]	[aba, decides, against, community, broadcastin	aba decides against community broadcasting lic	20030219	0
[act, fire, wit, must, awar, defam	[act, fire, wit, must, be, awar, of, defam]	[act, fire, witnesses, must, be, aware, of, de	act fire witnesses must be aware of defamation	20030219	1
[g, call, infrastructur, protect, summit	[a, g, call, for, infrastructur, protect, summit]	[a, g, calls, for, infrastructure, protection,	a g calls for infrastructure protection summit	20030219	2
[air, nz, staff, aust, strike, pay, rise]	[air, nz, staff, in, aust, strike, for, pay, r	[air, nz, staff, in, aust, strike, for, pay, r	air nz staff in aust strike for pay rise	20030219	3
[air, nz, strike, affect, australian, travel]	[air, nz, strike, to, affect, australian, travel]	[air, nz, strike, to, affect, australian, trav	air nz strike to affect australian travellers	20030219	4
[ambiti, olsson, win, tripl, jump	[ambiti, olsson, win, tripl, jump]	[ambitious, olsson, wins, triple, jump]	ambitious olsson wins triple jump	20030219	5
[antic, delight, record, break, barca]	[antic, delight, with, record, break, barca]	[antic, delighted, with, record, breaking, barca]	antic delighted with record breaking barca	20030219	6
[aussi, qualifi, stosur, wast, four, memphi, m	[aussi, qualifi, stosur, wast, four, memphi, m	[aussie, qualifier, stosur, wastes, four, memp	aussie qualifier stosur wastes four memphis match	20030219	7
[aust, address, un, secur, council, iraq]	[aust, address, un, secur, council, over, iraq]	[aust, addresses, un, security, council, over,	aust addresses un security council over iraq	20030219	8
[australia, lock, war, timet, opp	[australia, is, lock, into, war, timet, opp]	[australia, is, locked, into, war, timetable,	australia is locked into war timetable opp	20030219	9
[australia, contribut, 10, million, aid, iraq	[australia, to, contribut, 10, million, in, ai	[australia, to, contribute, 10, million, in, a	australia to contribute 10 million in aid to iraq	20030219	10
[barca, take, record, robson, celebr, birthday]	[barca, take, record, as, robson, celebr, birt	$[barca, take, record, as, robson, celebrates, \dots$	barca take record as robson celebrates birthda	20030219	11
[bathhous, plan, move, ahead]	[bathhous, plan, move, ahead]	[bathhouse, plans, move, ahead]	bathhouse plans move ahead	20030219	12
[big, hope, launceston, cycl, championship	[big, hope, for, launceston, cycl, championship]	[big, hopes, for, launceston, cycling, champio	big hopes for launceston cycling championship	20030219	13
[big, plan, boost, paroo, water, suppli	[big, plan, to, boost, paroo, water, suppli]	[big, plan, to, boost, paroo, water, supplies]	big plan to boost paroo water supplies	20030219	14
[blizzard, buri, unit, state, bill]	[blizzard, buri, unit, state, in, bill]	[blizzard, buries, united, states, in, bills]	blizzard buries united states in bills	20030219	15
[brigadi, dismiss, report, troop, harass	[brigadi, dismiss, report, troop, harass, in]	[brigadier, dismisses, reports, troops, harass	brigadier dismisses reports troops harassed in	20030219	16
[british, combat, troop, arriv, daili, kuwait	[british, combat, troop, arriv, daili, in, kuw	[british, combat, troops, arriving, daily, in,	british combat troops arriving daily in kuwait	20030219	17
[bryant, lead, laker, doubl, overtim, win	[bryant, lead, laker, to, doubl, overtim, win]	[bryant, leads, lakers, to, double, overtime, \dots	bryant leads lakers to double overtime win	20030219	18
[bushfir, victim, urg, see, centrelink]	[bushfir, victim, urg, to, see, centrelink]	[bushfire, victims, urged, to, see, centrelink]	bushfire victims urged to see centrelink	20030219	19
[busi, prepar, terrorist, attack]	[busi, should, prepar, for, terrorist, attack]	[businesses, should, prepare, for, terrorist, \dots	businesses should prepare for terrorist attacks	20030219	20
[calleri, aveng, final, defeat, elimin, massu	[calleri, aveng, final, defeat, to, elimin, ma	[calleri, avenges, final, defeat, to, eliminat	calleri avenges final defeat to eliminate massu	20030219	21
[call, ethanol, blend, fuel, go, ahead	[call, for, ethanol, blend, fuel, to, go, ahead]	[call, for, ethanol, blend, fuel, to, go, ahead]	call for ethanol blend fuel to go ahead	20030219	22
[carew, freak, goal, leav, roma, ruin]	[carew, freak, goal, leav, roma, in, ruin]	[carews, freak, goal, leaves, roma, in, ruins]	carews freak goal leaves roma in ruins	20030219	23
[cemeteri, miss, fund	[cemeteri, miss, out, on, fund]	[cemeteries, miss, out, on, funds]	cemeteries miss out on funds	20030219	24
[code, conduct, toughen, organ, donat, regul	[code, of, conduct, toughen, organ, donat, regul]	[code, of, conduct, toughens, organ, donation,	code of conduct toughens organ donation regula	20030219	25
[commonwealth, bank, cut, fix, home, loan, rate]	[commonwealth, bank, cut, fix, home, loan, rate]	[commonwealth, bank, cuts, fixed, home, loan, \dots	commonwealth bank cuts fixed home loan rates	20030219	26
[commun, urg, help, homeless, youth]	[commun, urg, to, help, homeless, youth]	[community, urged, to, help, homeless, youth]	community urged to help homeless youth	20030219	27
[council, chief, execut, fail, secur, posit	[council, chief, execut, fail, to, secur, posit]	[council, chief, executive, fails, to, secure,	council chief executive fails to secure position	20030219	28
[councillor, contest, wollongong, independ	[councillor, to, contest, wollongong, as, inde	[councillor, to, contest, wollongong, as, inde	councillor to contest wollongong as independent	20030219	29
[nsw, bushfir, cobargo, fire, destroy, town, m	[nsw, bushfir, cobargo, fire, destroy, town, m	[nsw, bushfires, cobargo, fire, destroys, town	nsw bushfires cobargo fire destroys towns main	20191231	1185988
[nsw, south, coast, fire, rf, emerg, warn	[nsw, south, coast, fire, rf, emerg, warn]	[nsw, south, coast, fires, rfs, emergency, war	nsw south coast fires rfs emergency warnings	20191231	1185989
[numer, structur, burnt, clifton, creek, victo	[numer, structur, burnt, in, clifton, creek, v	[numerous, structures, burnt, in, clifton, cre	numerous structures burnt in clifton creek vic	20191231	1185990
[properti, livestock, lost, follow, bushfir, a	[properti, and, livestock, lost, follow, bushf	[properties, and, livestock, lost, following,	properties and livestock lost following bushfi	20191231	1185991
[relax, australian, kid, fine]	[relax, australian, kid, are, do, just, fine]	[relax, australian, kids, are, doing, just, fine]	relax australian kids are doing just fine	20191231	1185992
[rf, volunt, firefight, die, truck, rollov	[rf, volunt, firefight, die, in, truck, rollov]	[rfs, volunteer, firefighter, dies, in, truck,	rfs volunteer firefighter dies in truck rollover	20191231	1185993
[riski, decis, nearli, cost, ian, munro, hi, l	[riski, decis, nearli, cost, ian, munro, hi, l	[risky, decision, nearly, cost, ian, munro, hi	risky decision nearly cost ian munro his life	20191231	1185994
[royal, darwin, hospit, emerg, medicin, director	[royal, darwin, hospit, emerg, medicin, director]	[royal, darwin, hospital, emergency, medicine,	royal darwin hospital emergency medicine director	20191231	1185995
[royal, darwin, hospit, medicin, director, dec	[royal, darwin, hospit, medicin, director, dec	[royal, darwin, hospital, medicine, director,	royal darwin hospital medicine director decrie	20191231	1185996
[rural, wach, livestock, handl, cup]	[rural, wach, livestock, handl, cup]	[rural, wach, livestock, handling, cup]	rural wach livestock handling cup	20191231	1185997
[scott, morrison, offer, deepest, sympathi, fi	[scott, morrison, offer, deepest, sympathi, af	[scott, morrison, offers, deepest, sympathies,	scott morrison offers deepest sympathies after	20191231	1185998
[sudan, sentenc, 29, intellig, agent, death, h	[sudan, sentenc, 29, intellig, agent, to, deat	[sudan, sentences, 29, intelligence, agents, t	sudan sentences 29 intelligence agents to deat	20191231	1185999
[sydney, famili, flee, bush, fire, tarbuck, bay]	[sydney, famili, flee, through, the, bush, aft	[sydney, family, flees, through, the, bush, af	sydney family flees through the bush after fir	20191231	1186000
[sydney, new, year, eve, firework, replac, drone]	[sydney, new, year, eve, firework, be, replac,	[sydney, new, years, eve, fireworks, be, repla	sydney new years eve fireworks be replaced by	20191231	1186001
[tasmania, new, year, eve, guid, 2019]	[tasmania, new, year, eve, guid, 2019]	[tasmania, new, years, eve, guide, 2019]	tasmania new years eve guide 2019	20191231	1186002
[cop, crimin, mental, health, ptsd, convers	[the, cop, and, the, crimin, mental, health, p	[the, cop, and, the, criminal, mental, health,	the cop and the criminal mental health ptsd co	20191231	1186003
[fire, engulf, hous, tracey, corbin]	[the, fire, is, engulf, the, hous, tracey, cor	[the, fire, is, engulfing, the, house, tracey,	the fire is engulfing the house: tracey corbin	20191231	1186004
[top, stori, 2019, decid, abc, news, reader	[these, are, the, top, stori, of, 2019, as, de	[these, are, the, top, stories, of, 2019, as,	these are the top stories of 2019 as decided b	20191231	1186005
[year, wa, 2019, highlight, memor, popular, st	[the, year, that, wa, 2019, highlight, memor,	[the, year, that, was, 2019, highlights, memor	the year that was 2019 highlights memorable po	20191231	1186006
[thousand, resid, standbi, mallacoota, beach]	[thousand, of, resid, on, standbi, at, mallaco	[thousands, of, residents, on, standby, at, ma	thousands of residents on standby at mallacoot	20191231	1186007
[top, stori, abc, news]	[top, stori, on, abc, news]	[top, stories, on, abc, news]	top stories on abc news	20191231	1186008
	[up, to, 4000, peopl, are, seek, refug, on, a,	[up, to, 4000, people, are, seeking, refuge, o	up to 4000 people are seeking refuge on a beac	20191231	1186009
[4000, peopl, seek, refug, beach, mallacoota]	[victoria, bushfir, mallacoota, resid, emerg]	[victoria, bushfire, mallacoota, residents, em	victoria bushfire mallacoota residents emergency	20191231	1186010
[4000, peopl, seek, refug, beach, mallacoota] [victoria, bushfir, mallacoota, resid, emerg,	[violona, baoriii, manacoola, roota, omorg]		victoria bushfire trapping people in east gipp	20191231	1186011
	[victoria, bushfir, trap, peopl, in, east, gip	[victoria, bushfire, trapping, people, in, eas	victoria basimic trapping people in cast gipp		
[victoria, bushfir, mallacoota, resid, emerg		[victorian, bushfire, trapping, people, in, eas [victorian, bushfire, emergency, mallacoota, g	victorian bushfire emergency mallacoota gippsl	20191231	1186012
[victoria, bushfir, mallacoota, resid, emerg]	[victoria, bushfir, trap, peopl, in, east, gip			20191231 20191231	1186012 1186013
[victoria, bushfir, mallacoota, resid, emerg] [victoria, bushfir, trap, peopl, east, gippsla [victorian, bushfir, emerg, mallacoota, gippsl	[victoria, bushfir, trap, peopl, in, east, gip [victorian, bushfir, emerg, mallacoota, gippsl	[victorian, bushfire, emergency, mallacoota, g	victorian bushfire emergency mallacoota gippsl		
[victoria, bushfir, mallacoota, resid, emerg; [victoria, bushfir, trap, peopl, east, gippsla [victorian, bushfir, emerg, mallacoota, gippsl [vision, flame, approach, corryong, victoria	[victoria, bushfir, trap, peopl, in, east, gip [victorian, bushfir, emerg, mallacoota, gippsl [vision, of, flame, approach, corryong, in, vi	[victorian, bushfire, emergency, mallacoota, g [vision, of, flames, approaching, corryong, in	victorian bushfire emergency mallacoota gippsl vision of flames approaching corryong in victoria	20191231	1186013
[victoria, bushfir, mallacoota, resid, emergi [victoria, bushfir, trap, peopl, east, gippsla [victorian, bushfir, emerg, mallacoota, gippsl [vision, flame, approach, corryong, victoria] [wa, polic, govern, backflip, drug, amnesti, bin	[victoria, bushfir, trap, peopl, in, east, gip [victorian, bushfir, emerg, mallacoota, gippsl [vision, of, flame, approach, corryong, in, vi [wa, polic, and, govern, backflip, on, drug, a	[victorian, bushfire, emergency, mallacoota, g [vision, of, flames, approaching, corryong, in [wa, police, and, government, backflip, on, dr	victorian bushfire emergency mallacoota gippsl vision of flames approaching corryong in victoria wa police and government backflip on drug amne	20191231 20191231	1186013 1186014

```
def rejoin_words(row):
    my_list = row['processed_stem']
    joined_words = ( " ".join(my_list))
    return joined_words
abc_df['processed_convo'] = abc_df.apply(rejoin_words, axis=1)
```

In [23]:

abc_df

Out[23]:

processed_conve	processed_stem	stemmed_words	words	headline_text	publish_date	
aba decid commun broadcast liceno	[aba, decid, commun, broadcast, licenc]	[aba, decid, against, commun, broadcast, licenc]	[aba, decides, against, community, broadcastin	aba decides against community broadcasting lic	20030219	0
act fire wit must awar defan	[act, fire, wit, must, awar, defam]	[act, fire, wit, must, be, awar, of, defam]	[act, fire, witnesses, must, be, aware, of, de	act fire witnesses must be aware of defamation	20030219	1
g call infrastructur protect summi	[g, call, infrastructur, protect, summit]	[a, g, call, for, infrastructur, protect, summit	[a, g, calls, for, infrastructure, protection,	a g calls for infrastructure protection summit	20030219	2
air nz staff aust strike pay rise	[air, nz, staff, aust, strike, pay, rise]	[air, nz, staff, in, aust, strike, for, pay, r	[air, nz, staff, in, aust, strike, for, pay, r	air nz staff in aust strike for pay rise	20030219	3
air nz strike affect australian trave	[air, nz, strike, affect, australian, travel]	[air, nz, strike, to, affect, australian, travel]	[air, nz, strike, to, affect, australian, trav	air nz strike to affect australian travellers	20030219	4
ambiti olsson win tripl jump	[ambiti, olsson, win, tripl, jump]	[ambiti, olsson, win, tripl, jump]	[ambitious, olsson, wins, triple, jump]	ambitious olsson wins triple jump	20030219	5
antic delight record break barca	[antic, delight, record, break, barca]	[antic, delight, with, record, break, barca]	[antic, delighted, with, record, breaking, barca]	antic delighted with record breaking barca	20030219	6
aussi qualifi stosur wast four memph match	[aussi, qualifi, stosur, wast, four, memphi, m	[aussi, qualifi, stosur, wast, four, memphi, m	[aussie, qualifier, stosur, wastes, four, memp	aussie qualifier stosur wastes four memphis match	20030219	7
aust address un secur council irac	[aust, address, un, secur, council, iraq]	[aust, address, un, secur, council, over, iraq]	[aust, addresses, un, security, council, over,	aust addresses un security council over iraq	20030219	8
australia lock war timet opp	[australia, lock, war, timet, opp]	[australia, is, lock, into, war, timet, opp]	[australia, is, locked, into, war, timetable,	australia is locked into war timetable opp	20030219	9
australia contribut 10 million aid irac	[australia, contribut, 10, million, aid, iraq]	[australia, to, contribut, 10, million, in,	[australia, to, contribute, 10, million, in, a	australia to contribute 10 million in aid to iraq	20030219	10
barca take record robson celebr birthda	[barca, take, record, robson, celebr, birthday]	[barca, take, record, as, robson, celebr, birt	[barca, take, record, as, robson, celebrates	barca take record as robson celebrates birthda	20030219	11
bathhous plan move ahead	[bathhous, plan, move, ahead]	[bathhous, plan, move, ahead]	[bathhouse, plans, move, ahead]	bathhouse plans move ahead	20030219	12
big hope launceston cycl championship	[big, hope, launceston, cycl, championship]	[big, hope, for, launceston, cycl, championship]	[big, hopes, for, launceston, cycling, champio	big hopes for launceston cycling championship	20030219	13
big plan boost paroo water suppl	[big, plan, boost, paroo, water, suppli]	[big, plan, to, boost, paroo, water, suppli]	[big, plan, to, boost, paroo, water, supplies]	big plan to boost paroo water supplies	20030219	14
blizzard buri unit state bil	[blizzard, buri, unit, state, bill]	[blizzard, buri, unit, state, in, bill]	[blizzard, buries, united, states, in, bills]	blizzard buries united states in bills	20030219	15
brigadi dismiss report troop haras	[brigadi, dismiss, report, troop, harass]	[brigadi, dismiss, report, troop, harass, in]	[brigadier, dismisses, reports, troops, harass	brigadier dismisses reports troops harassed in	20030219	16
british combat troop arriv daili kuwai	[british, combat, troop, arriv, daili, kuwait]	[british, combat, troop, arriv, daili, in, kuw	[british, combat, troops, arriving, daily, in,	british combat troops arriving daily in kuwait	20030219	17
bryant lead laker doubl overtim wir	[bryant, lead, laker, doubl, overtim, win]	[bryant, lead, laker, to, doubl, overtim, win]	[bryant, leads, lakers, to, double, overtime,	bryant leads lakers to double overtime win	20030219	18
bushfir victim urg see centrelinl	[bushfir, victim, urg, see, centrelink]	[bushfir, victim, urg, to, see, centrelink]	[bushfire, victims, urged, to, see, centrelink]	bushfire victims urged to see centrelink	20030219	19
busi prepar terrorist attacl	[busi, prepar, terrorist, attack]	[busi, should, prepar, for, terrorist, attack]	[businesses, should, prepare, for,	businesses should prepare for terrorist	20030219	20
	[calleri, aveng, final, defeat, elimin,	[calleri, aveng, final, defeat, to, elimin,	terrorist, [calleri, avenges, final, defeat, to,	attacks calleri avenges final defeat to eliminate		
calleri aveng final defeat elimin massu	massu]	ma [call, for, ethanol, blend, fuel, to, go,	eliminat [call, for, ethanol, blend, fuel, to, go,	massu	20030219	21
call ethanol blend fuel go ahead	[call, ethanol, blend, fuel, go, ahead]	ahead]	ahead]	call for ethanol blend fuel to go ahead	20030219	22
carew freak goal leav roma ruir	[carew, freak, goal, leav, roma, ruin]	[carew, freak, goal, leav, roma, in, ruin]	[carews, freak, goal, leaves, roma, in, ruins]	carews freak goal leaves roma in ruins	20030219	23
cemeteri miss fund	[cemeteri, miss, fund] [code, conduct, toughen, organ, donat,	[cemeteri, miss, out, on, fund] [code, of, conduct, toughen, organ,	[cemeteries, miss, out, on, funds] [code, of, conduct, toughens, organ,	cemeteries miss out on funds code of conduct toughens organ donation	20030219	24
code conduct toughen organ donat regu	regul]	donat, regul]	donation,	regula	20030219	25
commonwealth bank cut fix home loar rate	[commonwealth, bank, cut, fix, home, loan, rate]	[commonwealth, bank, cut, fix, home, loan, rate]	[commonwealth, bank, cuts, fixed, home, loan,	commonwealth bank cuts fixed home loan rates	20030219	26
commun urg help homeless youth	[commun, urg, help, homeless, youth]	[commun, urg, to, help, homeless, youth]	[community, urged, to, help, homeless, youth]	community urged to help homeless youth	20030219	27
council chief execut fail secur posi	[council, chief, execut, fail, secur, posit]	[council, chief, execut, fail, to, secur, posit]	[council, chief, executive, fails, to, secure,	council chief executive fails to secure position	20030219	28
councillor contest wollongong independ	[councillor, contest, wollongong, independ]	[councillor, to, contest, wollongong, as, inde	[councillor, to, contest, wollongong, as, inde	councillor to contest wollongong as independent	20030219	29
nsw bushfir cobargo fire destroy town main stree	[nsw, bushfir, cobargo, fire, destroy, town, m	[nsw, bushfir, cobargo, fire, destroy, town, m	[nsw, bushfires, cobargo, fire, destroys, town	nsw bushfires cobargo fire destroys towns main	20191231	1185988
nsw south coast fire rf emerg warr	[nsw, south, coast, fire, rf, emerg, warn]	[nsw, south, coast, fire, rf, emerg, warn]	[nsw, south, coast, fires, rfs, emergency, war	nsw south coast fires rfs emergency warnings	20191231	1185989
numer structur burnt clifton creek victoria	[numer, structur, burnt, clifton, creek, victo	[numer, structur, burnt, in, clifton, creek,	[numerous, structures, burnt, in, clifton, cre	numerous structures burnt in clifton creek vic	20191231	1185990
properti livestock lost follow bushfi across sa	[properti, livestock, lost, follow, bushfir, a	[properti, and, livestock, lost, follow, bushf	[properties, and, livestock, lost, following,	properties and livestock lost following bushfi	20191231	1185991
relax australian kid fine	[relax, australian, kid, fine]	[relax, australian, kid, are, do, just, fine]	 [relax, australian, kids, are, doing, just, fine]	relax australian kids are doing just fine	20191231	1185992
rf volunt firefight die truck rollo	[rf, volunt, firefight, die, truck, rollov]	[rf, volunt, firefight, die, in, truck, rollov]	[rfs, volunteer, firefighter, dies, in, truck,	rfs volunteer firefighter dies in truck rollover	20191231	1185993
riski decis nearli cost ian munro hi life	[riski, decis, nearli, cost, ian, munro, hi, I	[riski, decis, nearli, cost, ian, munro, hi, I	[risky, decision, nearly, cost, ian, munro, hi	risky decision nearly cost ian munro his life	20191231	1185994
royal darwin hospit emerg medicir directo	[royal, darwin, hospit, emerg, medicin, director]	[royal, darwin, hospit, emerg, medicin, director]	[royal, darwin, hospital, emergency, medicine,	royal darwin hospital emergency medicine director	20191231	1185995
royal darwin hospit medicin director decr	[royal, darwin, hospit, medicin, director, dec	[royal, darwin, hospit, medicin, director, dec	[royal, darwin, hospital, medicine, director,	royal darwin hospital medicine director decrie	20191231	1185996
rural wach livestock handl cup	[rural, wach, livestock, handl, cup]	[rural, wach, livestock, handl, cup]	[rural, wach, livestock, handling, cup]	rural wach livestock handling cup	20191231	1185997
scott morrison offer deepest sympath firefigh	[scott, morrison, offer, deepest, sympathi, fi	[scott, morrison, offer, deepest, sympathi, af	[scott, morrison, offers, deepest, sympathies,	scott morrison offers deepest sympathies after	20191231	1185998
sudan sentenc 29 intellig agent death	[sudan, sentenc, 29, intellig, agent, death, h	[sudan, sentenc, 29, intellig, agent, to, deat	[sudan, sentences, 29, intelligence, agents, t	sudan sentences 29 intelligence agents to deat	20191231	1185999
sydney famili flee bush fire tarbuck bay	[sydney, famili, flee, bush, fire, tarbuck, bay]	[sydney, famili, flee, through, the, bush, aft	[sydney, family, flees, through, the, bush, af	sydney family flees through the bush after fir	20191231	1186000
sydney new year eve firework repla	[sydney, new, year, eve, firework,	[sydney, new, year, eve, firework, be,	[sydney, new, years, eve, fireworks, be,	sydney new years eve fireworks be	20191231	1186001
drone tasmania new year eve guid 2019	replac, drone] [tasmania, new, year, eve, guid, 2019]	replac, [tasmania, new, year, eve, guid, 2019]	repla [tasmania, new, years, eve, guide, 2019]	replaced by tasmania new years eve guide 2019	20191231	1186002
cop crimin mental health ptsd convers	[cop, crimin, mental, health, ptsd, convers]	[the, cop, and, the, crimin, mental, health, p	[the, cop, and, the, criminal, mental, health,	the cop and the criminal mental health ptsd co	20191231	1186003
fire angulf hous tracouses this		[the, fire, is, engulf, the, hous, tracey,	[the, fire, is, engulfing, the, house,	the fire is engulfing the house: tracey	20101224	1186004
fire engulf hous tracey corbin	[fire, engulf, hous, tracey, corbin]	cor	tracey,	corbin	20191231	1186004

1186005	20191231	these are the top stories of 2019 as decided b	[these, are, the, top, stories, of, 2019, as,	[these, are, the, top, stori, of, 2019, as, de	[top, stori, 2019, decid, abc, news, reader]	top stori 2019 decid abc news reader
1186006	20191231	the year that was 2019 highlights memorable po	[the, year, that, was, 2019, highlights, memor	[the, year, that, wa, 2019, highlight, memor,	[year, wa, 2019, highlight, memor, popular, st	year wa 2019 highlight memor popular stori
1186007	20191231	thousands of residents on standby at mallacoot	[thousands, of, residents, on, standby, at, ma	[thousand, of, resid, on, standbi, at, mallaco	[thousand, resid, standbi, mallacoota, beach]	thousand resid standbi mallacoota beach
1186008	20191231	top stories on abc news	[top, stories, on, abc, news]	[top, stori, on, abc, news]	[top, stori, abc, news]	top stori abc news
1186009	20191231	up to 4000 people are seeking refuge on a beac	[up, to, 4000, people, are, seeking, refuge, o	[up, to, 4000, peopl, are, seek, refug, on, a,	[4000, peopl, seek, refug, beach, mallacoota]	4000 peopl seek refug beach mallacoota
1186010	20191231	victoria bushfire mallacoota residents emergency	[victoria, bushfire, mallacoota, residents, em	[victoria, bushfir, mallacoota, resid, emerg]	[victoria, bushfir, mallacoota, resid, emerg]	victoria bushfir mallacoota resid emerg
1186011	20191231	victoria bushfire trapping people in east gipp	[victoria, bushfire, trapping, people, in, eas	[victoria, bushfir, trap, peopl, in, east, gip	[victoria, bushfir, trap, peopl, east, gippsla	victoria bushfir trap peopl east gippsland liv
1186012	20191231	victorian bushfire emergency mallacoota gippsl	[victorian, bushfire, emergency, mallacoota, g	[victorian, bushfir, emerg, mallacoota, gippsl	[victorian, bushfir, emerg, mallacoota, gippsl	victorian bushfir emerg mallacoota gippsland c
1186013	20191231	vision of flames approaching corryong in victoria	[vision, of, flames, approaching, corryong, in	[vision, of, flame, approach, corryong, in, vi	[vision, flame, approach, corryong, victoria]	vision flame approach corryong victoria
1186014	20191231	wa police and government backflip on drug amne	[wa, police, and, government, backflip, on, dr	[wa, polic, and, govern, backflip, on, drug, a	[wa, polic, govern, backflip, drug, amnesti, bin]	wa polic govern backflip drug amnesti bin
1186015	20191231	we have fears for their safety: victorian premier	[we, have, fears, for, their, safety, victoria	[we, have, fear, for, their, safeti, victorian	[fear, safeti, victorian, premier]	fear safeti victorian premier
1186016	20191231	when do the 20s start	[when, do, the, 20s, start]	[when, do, the, 20, start]	[20, start]	20 start
1186017	20191231	yarraville shooting woman dead man critically	[yarraville, shooting, woman, dead, man, criti	[yarravil, shoot, woman, dead, man, critic, in	[yarravil, shoot, woman, dead, man, critic, in	yarravil shoot woman dead man critic injur

1186018 rows × 6 columns

ANALYSIS

After process the whole the data set we will move towards analysis the data and through this analysis answering the question. the dictates that we need to identify the top converstion over the last decade, therefore, we are selecting the dates from over the last decade, since the dates are in the form of arugment we are converting into datetime.

Tn [24]

abc_df['publish_date'] = pd.to_datetime(abc_df['publish_date'], format='%Y%m%d')
abc_df

Out[24]:

	publish_date	headline_text	words	stemmed_words	processed_stem	processed_convo
0	2003-02-19	aba decides against community broadcasting lic	[aba, decides, against, community, broadcastin	[aba, decid, against, commun, broadcast, licenc]	[aba, decid, commun, broadcast, licenc]	aba decid commun broadcast licenc
1	2003-02-19	act fire witnesses must be aware of defamation	[act, fire, witnesses, must, be, aware, of, de	[act, fire, wit, must, be, awar, of, defam]	[act, fire, wit, must, awar, defam]	act fire wit must awar defam
2	2003-02-19	a g calls for infrastructure protection summit	[a, g, calls, for, infrastructure, protection,	[a, g, call, for, infrastructur, protect, summit]	[g, call, infrastructur, protect, summit]	g call infrastructur protect summit
3	2003-02-19	air nz staff in aust strike for pay rise	[air, nz, staff, in, aust, strike, for, pay, r	[air, nz, staff, in, aust, strike, for, pay, r	[air, nz, staff, aust, strike, pay, rise]	air nz staff aust strike pay rise
4	2003-02-19	air nz strike to affect australian travellers	[air, nz, strike, to, affect, australian, trav	[air, nz, strike, to, affect, australian, travel]	[air, nz, strike, affect, australian, travel]	air nz strike affect australian travel
5	2003-02-19	ambitious olsson wins triple jump	[ambitious, olsson, wins, triple, jump]	[ambiti, olsson, win, tripl, jump]	[ambiti, olsson, win, tripl, jump]	ambiti olsson win tripl jump
6	2003-02-19	antic delighted with record breaking barca	[antic, delighted, with, record, breaking, barca]	[antic, delight, with, record, break, barca]	[antic, delight, record, break, barca]	antic delight record break barca
7	2003-02-19	aussie qualifier stosur wastes four memphis match	[aussie, qualifier, stosur, wastes, four, memp	[aussi, qualifi, stosur, wast, four, memphi, m	[aussi, qualifi, stosur, wast, four, memphi, m	aussi qualifi stosur wast four memphi match
8	2003-02-19	aust addresses un security council over iraq	[aust, addresses, un, security, council, over,	[aust, address, un, secur, council, over, iraq]	[aust, address, un, secur, council, iraq]	aust address un secur council iraq
9	2003-02-19	australia is locked into war timetable opp	[australia, is, locked, into, war, timetable,	[australia, is, lock, into, war, timet, opp]	[australia, lock, war, timet, opp]	australia lock war timet opp
10	2003-02-19	australia to contribute 10 million in aid to iraq	[australia, to, contribute, 10, million, in, a	[australia, to, contribut, 10, million, in, ai	[australia, contribut, 10, million, aid, iraq]	australia contribut 10 million aid iraq
11	2003-02-19	barca take record as robson celebrates birthda	[barca, take, record, as, robson, celebrates,	[barca, take, record, as, robson, celebr, birt	[barca, take, record, robson, celebr, birthday]	barca take record robson celebr birthday
12	2003-02-19	bathhouse plans move ahead	[bathhouse, plans, move, ahead]	[bathhous, plan, move, ahead]	[bathhous, plan, move, ahead]	bathhous plan move ahead
13	2003-02-19	big hopes for launceston cycling championship	[big, hopes, for, launceston, cycling, champio	[big, hope, for, launceston, cycl, championship]	[big, hope, launceston, cycl, championship]	big hope launceston cycl championship
14	2003-02-19	big plan to boost paroo water supplies	[big, plan, to, boost, paroo, water, supplies]	[big, plan, to, boost, paroo, water, suppli]	[big, plan, boost, paroo, water, suppli]	big plan boost paroo water suppli
15	2003-02-19	blizzard buries united states in bills	[blizzard, buries, united, states, in, bills]	[blizzard, buri, unit, state, in, bill]	[blizzard, buri, unit, state, bill]	blizzard buri unit state bill
16	2003-02-19	brigadier dismisses reports troops harassed in	[brigadier, dismisses, reports, troops, harass	[brigadi, dismiss, report, troop, harass, in]	[brigadi, dismiss, report, troop, harass]	brigadi dismiss report troop harass
17	2003-02-19	british combat troops arriving daily in kuwait	[british, combat, troops, arriving, daily, in,	[british, combat, troop, arriv, daili, in, kuw	[british, combat, troop, arriv, daili, kuwait]	british combat troop arriv daili kuwait
18	2003-02-19	bryant leads lakers to double overtime win	[bryant, leads, lakers, to, double, overtime,	[bryant, lead, laker, to, doubl, overtim, win]	[bryant, lead, laker, doubl, overtim, win]	bryant lead laker doubl overtim win
19	2003-02-19	bushfire victims urged to see centrelink	[bushfire, victims, urged, to, see, centrelink]	[bushfir, victim, urg, to, see, centrelink]	[bushfir, victim, urg, see, centrelink]	bushfir victim urg see centrelink
20	2003-02-19	businesses should prepare for terrorist attacks	[businesses, should, prepare, for, terrorist,	[busi, should, prepar, for, terrorist, attack]	[busi, prepar, terrorist, attack]	busi prepar terrorist attack
21	2003-02-19	calleri avenges final defeat to eliminate massu	[calleri, avenges, final, defeat, to, eliminat	[calleri, aveng, final, defeat, to, elimin, ma	[calleri, aveng, final, defeat, elimin, massu]	calleri aveng final defeat elimin massu
22	2003-02-19	call for ethanol blend fuel to go ahead	[call, for, ethanol, blend, fuel, to, go, ahead]	[call, for, ethanol, blend, fuel, to, go, ahead]	[call, ethanol, blend, fuel, go, ahead]	call ethanol blend fuel go ahead
23	2003-02-19	carews freak goal leaves roma in ruins	[carews, freak, goal, leaves, roma, in, ruins]	[carew, freak, goal, leav, roma, in, ruin]	[carew, freak, goal, leav, roma, ruin]	carew freak goal leav roma ruin
24	2003-02-19	cemeteries miss out on funds	[cemeteries, miss, out, on, funds]	[cemeteri, miss, out, on, fund]	[cemeteri, miss, fund]	cemeteri miss fund
25	2003-02-19	code of conduct toughens organ donation regula	[code, of, conduct, toughens, organ, donation,	[code, of, conduct, toughen, organ, donat, regul]	[code, conduct, toughen, organ, donat, regul]	code conduct toughen organ donat regul
26	2003-02-19	commonwealth bank cuts fixed home loan rates	[commonwealth, bank, cuts, fixed, home, loan,	[commonwealth, bank, cut, fix, home, loan, rate]	[commonwealth, bank, cut, fix, home, loan, rate]	commonwealth bank cut fix home loan rate
27	2003-02-19	community urged to help homeless youth	[community, urged, to, help, homeless, youth]	[commun, urg, to, help, homeless, youth]	[commun, urg, help, homeless, youth]	commun urg help homeless youth
28	2003-02-19	council chief executive fails to secure position	[council, chief, executive, fails, to, secure,	[council, chief, execut, fail, to, secur, posit]	[council, chief, execut, fail, secur, posit]	council chief execut fail secur posit
29	2003-02-19	councillor to contest wollongong as independent	[councillor, to, contest, wollongong, as, inde	[councillor, to, contest, wollongong, as, inde	[councillor, contest, wollongong, independ]	councillor contest wollongong independ
						•••
1185988	2019-12-31	nsw bushfires cobargo fire destroys towns main	[nsw, bushfires, cobargo, fire, destroys, town	[nsw, bushfir, cobargo, fire, destroy, town, m	[nsw, bushfir, cobargo, fire, destroy, town, m	nsw bushfir cobargo fire destroy town main street
1185989	2019-12-31	nsw south coast fires rfs emergency warnings	[nsw, south, coast, fires, rfs, emergency, war	[nsw, south, coast, fire, rf, emerg, warn]	[nsw, south, coast, fire, rf, emerg, warn]	nsw south coast fire rf emerg warn

1185990	2019-12-31	numerous structures burnt in clifton creek	[numerous, structures, burnt, in, clifton,	[numer, structur, burnt, in, clifton, creek,	[numer, structur, burnt, clifton, creek,	numer structur burnt clifton creek victoria
1100990	2019-12-31	vic	cre	V	victo	numer structur burnt cinton creek victoria
1185991	2019-12-31	properties and livestock lost following bushfi	[properties, and, livestock, lost, following,	[properti, and, livestock, lost, follow, bushf	[properti, livestock, lost, follow, bushfir, a	properti livestock lost follow bushfir across sa
1185992	2019-12-31	relax australian kids are doing just fine	[relax, australian, kids, are, doing, just, fine]	[relax, australian, kid, are, do, just, fine]	[relax, australian, kid, fine]	relax australian kid fine
1185993	2019-12-31	rfs volunteer firefighter dies in truck rollover	[rfs, volunteer, firefighter, dies, in, truck,	[rf, volunt, firefight, die, in, truck, rollov]	[rf, volunt, firefight, die, truck, rollov]	rf volunt firefight die truck rollov
1185994	2019-12-31	risky decision nearly cost ian munro his life	[risky, decision, nearly, cost, ian, munro, hi	[riski, decis, nearli, cost, ian, munro, hi, l	[riski, decis, nearli, cost, ian, munro, hi, I	riski decis nearli cost ian munro hi life
1185995	2019-12-31	royal darwin hospital emergency medicine director	[royal, darwin, hospital, emergency, medicine,	[royal, darwin, hospit, emerg, medicin, director]	[royal, darwin, hospit, emerg, medicin, director]	royal darwin hospit emerg medicin director
1185996	2019-12-31	royal darwin hospital medicine director decrie	[royal, darwin, hospital, medicine, director,	[royal, darwin, hospit, medicin, director, dec	[royal, darwin, hospit, medicin, director, dec	royal darwin hospit medicin director decri ove
1185997	2019-12-31	rural wach livestock handling cup	[rural, wach, livestock, handling, cup]	[rural, wach, livestock, handl, cup]	[rural, wach, livestock, handl, cup]	rural wach livestock handl cup
1185998	2019-12-31	scott morrison offers deepest sympathies after	[scott, morrison, offers, deepest, sympathies,	[scott, morrison, offer, deepest, sympathi, ${\sf af}$	[scott, morrison, offer, deepest, sympathi, fi	scott morrison offer deepest sympathi firefigh
1185999	2019-12-31	sudan sentences 29 intelligence agents to deat	[sudan, sentences, 29, intelligence, agents, t	[sudan, sentenc, 29, intellig, agent, to, deat	[sudan, sentenc, 29, intellig, agent, death, h	sudan sentenc 29 intellig agent death hang
1186000	2019-12-31	sydney family flees through the bush after fir	[sydney, family, flees, through, the, bush, af	[sydney, famili, flee, through, the, bush, aft	[sydney, famili, flee, bush, fire, tarbuck, bay]	sydney famili flee bush fire tarbuck bay
1186001	2019-12-31	sydney new years eve fireworks be replaced by	[sydney, new, years, eve, fireworks, be, repla	[sydney, new, year, eve, firework, be, replac,	[sydney, new, year, eve, firework, replac, drone]	sydney new year eve firework replac drone
1186002	2019-12-31	tasmania new years eve guide 2019	[tasmania, new, years, eve, guide, 2019]	[tasmania, new, year, eve, guid, 2019]	[tasmania, new, year, eve, guid, 2019]	tasmania new year eve guid 2019
1186003	2019-12-31	the cop and the criminal mental health ptsd $$\rm co$	[the, cop, and, the, criminal, mental, health,	[the, cop, and, the, crimin, mental, health, p	[cop, crimin, mental, health, ptsd, convers]	cop crimin mental health ptsd convers
1186004	2019-12-31	the fire is engulfing the house: tracey corbin	[the, fire, is, engulfing, the, house, tracey,	[the, fire, is, engulf, the, hous, tracey, cor	[fire, engulf, hous, tracey, corbin]	fire engulf hous tracey corbin
1186005	2019-12-31	these are the top stories of 2019 as decided b	[these, are, the, top, stories, of, 2019, as,	[these, are, the, top, stori, of, 2019, as, de	[top, stori, 2019, decid, abc, news, reader]	top stori 2019 decid abc news reader
1186006	2019-12-31	the year that was 2019 highlights memorable po	[the, year, that, was, 2019, highlights, memor	[the, year, that, wa, 2019, highlight, memor,	[year, wa, 2019, highlight, memor, popular, st	year wa 2019 highlight memor popular stori
1186007	2019-12-31	thousands of residents on standby at mallacoot	[thousands, of, residents, on, standby, at, ma	[thousand, of, resid, on, standbi, at, mallaco	[thousand, resid, standbi, mallacoota, beach]	thousand resid standbi mallacoota beach
1186008	2019-12-31	top stories on abc news	[top, stories, on, abc, news]	[top, stori, on, abc, news]	[top, stori, abc, news]	top stori abc news
1186009	2019-12-31	up to 4000 people are seeking refuge on a beac	[up, to, 4000, people, are, seeking, refuge, o	[up, to, 4000, peopl, are, seek, refug, on, a,	[4000, peopl, seek, refug, beach, mallacoota]	4000 peopl seek refug beach mallacoota
1186010	2019-12-31	victoria bushfire mallacoota residents emergency	[victoria, bushfire, mallacoota, residents, em	[victoria, bushfir, mallacoota, resid, emerg]	[victoria, bushfir, mallacoota, resid, emerg]	victoria bushfir mallacoota resid emerg
1186011	2019-12-31	victoria bushfire trapping people in east gipp	[victoria, bushfire, trapping, people, in, eas	[victoria, bushfir, trap, peopl, in, east, gip	[victoria, bushfir, trap, peopl, east, gippsla	victoria bushfir trap peopl east gippsland liv
1186012	2019-12-31	victorian bushfire emergency mallacoota gippsl	[victorian, bushfire, emergency, mallacoota, g	[victorian, bushfir, emerg, mallacoota, gippsl	[victorian, bushfir, emerg, mallacoota, gippsl	victorian bushfir emerg mallacoota gippsland c
1186013	2019-12-31	vision of flames approaching corryong in victoria	[vision, of, flames, approaching, corryong, in	[vision, of, flame, approach, corryong, in, vi	[vision, flame, approach, corryong, victoria]	vision flame approach corryong victoria
1186014	2019-12-31	wa police and government backflip on drug amne	[wa, police, and, government, backflip, on, dr	[wa, polic, and, govern, backflip, on, drug, a	[wa, polic, govern, backflip, drug, amnesti, bin]	wa polic govern backflip drug amnesti bin
1186015	2019-12-31	we have fears for their safety: victorian premier	[we, have, fears, for, their, safety, victoria	[we, have, fear, for, their, safeti, victorian	[fear, safeti, victorian, premier]	fear safeti victorian premier
1186016	2019-12-31	when do the 20s start	[when, do, the, 20s, start]	[when, do, the, 20, start]	[20, start]	20 start
1186017	2019-12-31	yarraville shooting woman dead man critically	[yarraville, shooting, woman, dead, man, criti	[yarravil, shoot, woman, dead, man, critic, in	[yarravil, shoot, woman, dead, man, critic, in	yarravil shoot woman dead man critic injur

1186018 rows × 6 columns

#seting index publish_date
abc_df = abc_df.set_index(abc_df['publish_date'])

#filtering the data
Filter_List = abc_df.loc['2010-01-01':'2019-12-31']
Filter_List

Out[26]:

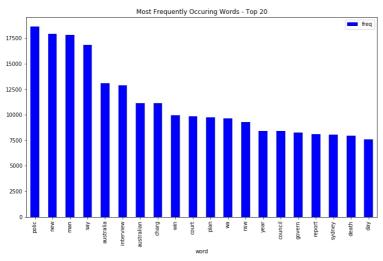
	publish_date	headline_text	words	stemmed_words	processed_stem	processed_convo
publish_date						
2010-01-01	2010-01-01	12m degas stolen from museum	[12m, degas, stolen, from, museum]	[12m, dega, stolen, from, museum]	[12m, dega, stolen, museum]	12m dega stolen museum
2010-01-01	2010-01-01	17 die in bangladesh bus crash	[17, die, in, bangladesh, bus, crash]	[17, die, in, bangladesh, bu, crash]	[17, die, bangladesh, bu, crash]	17 die bangladesh bu crash
2010-01-01	2010-01-01	2010 to be drier after very wet 2009	[2010, to, be, drier, after, very, wet, 2009]	[2010, to, be, drier, after, veri, wet, 2009]	[2010, drier, veri, wet, 2009]	2010 drier veri wet 2009
2010-01-01	2010-01-01	37 catholic workers killed worldwide	[37, catholic, workers, killed, worldwide]	[37, cathol, worker, kill, worldwid]	[37, cathol, worker, kill, worldwid]	37 cathol worker kill worldwid
2010-01-01	2010-01-01	600 hurt in philippine new year revelry	[600, hurt, in, philippine, new, year, revelry]	[600, hurt, in, philippin, new, year, revelri]	[600, hurt, philippin, new, year, revelri]	600 hurt philippin new year revelri
2010-01-01	2010-01-01	abbott vows to turn back asylum seekers	[abbott, vows, to, turn, back, asylum, seekers]	[abbott, vow, to, turn, back, asylum, seeker]	[abbott, vow, turn, back, asylum, seeker]	abbott vow turn back asylum seeker
2010-01-01	2010-01-01	accused refused bail over deakin break in	[accused, refused, bail, over, deakin, break, in]	[accus, refus, bail, over, deakin, break, in]	[accus, refus, bail, deakin, break]	accus refus bail deakin break
2010-01-01	2010-01-01	agforce opposes great barrier reef run off	[agforce, opposes, great, barrier, reef, run,	[agforc, oppos, great, barrier, reef, run, off]	[agforc, oppos, great, barrier, reef, run]	agforc oppos great barrier reef run
2010-01-01	2010-01-01	airport security stripped bare	[airport, security, stripped, bare]	[airport, secur, strip, bare]	[airport, secur, strip, bare]	airport secur strip bare
2010-01-01	2010-01-01	alcohol related injuries flood qld emergency w	[alcohol, related, injuries, flood, qld, emerg	[alcohol, relat, injuri, flood, qld, emerg, ward]	[alcohol, relat, injuri, flood, qld, emerg, ward]	alcohol relat injuri flood qld emerg ward
2010-01-01	2010-01-01	all eyes on belgian comeback queens	[all, eyes, on, belgian, comeback, queens]	[all, eye, on, belgian, comeback, queen]	[eye, belgian, comeback, queen]	eye belgian comeback queen
2010-01-01	2010-01-01	anger as centrelink fast tracks repayments	[anger, as, centrelink, fast, tracks, repayments]	[anger, as, centrelink, fast, track, repay]	[anger, centrelink, fast, track, repay]	anger centrelink fast track repay
2010-01-01	2010-01-01	another asylum seeker boat intercepted	[another, asylum, seeker, boat, intercepted]	[anoth, asylum, seeker, boat, intercept]	[anoth, asylum, seeker, boat, intercept]	anoth asylum seeker boat intercept
2010-01-01	2010-01-01	arsenal re signs young gun diaby	[arsenal, re, signs, young, gun, diaby]	[arsen, re, sign, young, gun, diabi]	[arsen, sign, young, gun, diabi]	arsen sign young gun diabi
2010-01-01	2010-01-01	art exhibit set to boost local economy	[art, exhibit, set, to, boost, local, economy]	[art, exhibit, set, to, boost, local, economi]	[art, exhibit, set, boost, local, economi]	art exhibit set boost local economi
2010-01-01	2010-01-01	australia brings in 2010 with a bang	[australia, brings, in, 2010, with, a, bang]	[australia, bring, in, 2010, with, a, bang]	[australia, bring, 2010, bang]	australia bring 2010 bang
2010-01-01	2010-01-01	australias coal addiction set in train 30 year	[australias, coal, addiction, set, in, train,	[australia, coal, addict, set, in, train, 30,	[australia, coal, addict, set, train, 30, year	australia coal addict set train 30 year ago
2010-01-01	2010-01-01	birt naved save panicking tigers	[birt, naved, save, panicking, tigers]	[birt, nave, save, panick, tiger]	[birt, nave, save, panick, tiger]	birt nave save panick tiger
2010-01-01	2010-01-01	blanchett extends stay at theatre company	[blanchett, extends, stay, at, theatre, company]	[blanchett, extend, stay, at, theatr, compani]	[blanchett, extend, stay, theatr, compani]	blanchett extend stay theatr compani
2010-01-01	2010-01-01	blaze leads nbl into 2010	[blaze, leads, nbl, into, 2010]	[blaze, lead, nbl, into, 2010]	[blaze, lead, nbl, 2010]	blaze lead nbl 2010

2010-01-01	2010-01-01	body found inside incinerated car	[body, found, inside, incinerated, car]	[bodi, found, insid, inciner, car]	[bodi, found, insid, inciner, car]	bodi found insid inciner car
2010-01-01	2010-01-01	body of diver found off wa	[body, of, diver, found, off, wa]	[bodi, of, diver, found, off, wa]	[bodi, diver, found, wa]	bodi diver found wa
2010-01-01	2010-01-01	bomb suspect began journey in ghana	[bomb, suspect, began, journey, in, ghana]	[bomb, suspect, began, journey, in, ghana]	[bomb, suspect, began, journey, ghana]	bomb suspect began journey ghana
2010-01-01	2010-01-01	boosted police presence after family feud	[boosted, police, presence, after, family, feud]	[boost, polic, presenc, after, famili, feud]	[boost, polic, presenc, famili, feud]	boost polic presenc famili feud
2010-01-01	2010-01-01	boy hit with robbery driving charges	[boy, hit, with, robbery, driving, charges]	[boy, hit, with, robberi, drive, charg]	[boy, hit, robberi, drive, charg]	boy hit robberi drive charg
2010-01-01	2010-01-01	brisbane city hall closes for repairs	[brisbane, city, hall, closes, for, repairs]	[brisban, citi, hall, close, for, repair]	[brisban, citi, hall, close, repair]	brisban citi hall close repair
2010-01-01	2010-01-01	brisbanes demolished bellevue hotel was worth	[brisbanes, demolished, bellevue, hotel, was,	[brisban, demolish, bellevu, hotel, wa, worth]	[brisban, demolish, bellevu, hotel, wa, worth]	brisban demolish bellevu hotel wa worth
2010-01-01	2010-01-01	bushranger bravo eyes revenge of his own	[bushranger, bravo, eyes, revenge, of, his, own]	[bushrang, bravo, eye, reveng, of, hi, own]	[bushrang, bravo, eye, reveng, hi]	bushrang bravo eye reveng hi
2010-01-01	2010-01-01	cabinet papers show bjelke petersen contemplated	[cabinet, papers, show, bjelke, petersen, cont	[cabinet, paper, show, bjelk, petersen, contempl]	[cabinet, paper, show, bjelk, petersen, contempl]	cabinet paper show bjelk petersen contempl
2010-01-01	2010-01-01	cabinet secrets from 1979 released	[cabinet, secrets, from, 1979, released]	[cabinet, secret, from, 1979, releas]	[cabinet, secret, 1979, releas]	cabinet secret 1979 releas
2019-12-31	2019-12-31	nsw bushfires cobargo fire destroys towns main	[nsw, bushfires, cobargo, fire, destroys, town	[nsw, bushfir, cobargo, fire, destroy, town, m	[nsw, bushfir, cobargo, fire, destroy, town, m	nsw bushfir cobargo fire destroy town main street
2019-12-31	2019-12-31	nsw south coast fires rfs emergency warnings	[nsw, south, coast, fires, rfs, emergency, war	[nsw, south, coast, fire, rf, emerg, warn]	[nsw, south, coast, fire, rf, emerg, warn]	nsw south coast fire rf emerg warn
2019-12-31	2019-12-31	numerous structures burnt in clifton creek vic	[numerous, structures, burnt, in, clifton, cre	[numer, structur, burnt, in, clifton, creek, v	[numer, structur, burnt, clifton, creek, victo	numer structur burnt clifton creek victoria
2019-12-31	2019-12-31	properties and livestock lost following bushfi	[properties, and, livestock, lost, following,	[properti, and, livestock, lost, follow, bushf	[properti, livestock, lost, follow, bushfir, a	properti livestock lost follow bushfir across sa
2019-12-31	2019-12-31	relax australian kids are doing just fine	[relax, australian, kids, are, doing, just, fine]	[relax, australian, kid, are, do, just, fine]	[relax, australian, kid, fine]	relax australian kid fine
2019-12-31	2019-12-31	rfs volunteer firefighter dies in truck rollover	[rfs, volunteer, firefighter, dies, in, truck,	[rf, volunt, firefight, die, in, truck, rollov]	[rf, volunt, firefight, die, truck, rollov]	rf volunt firefight die truck rollov
2019-12-31	2019-12-31	risky decision nearly cost ian munro his life	[risky, decision, nearly, cost, ian, munro, hi	[riski, decis, nearli, cost, ian, munro, hi, I	[riski, decis, nearli, cost, ian, munro, hi, l	riski decis nearli cost ian munro hi life
2019-12-31	2019-12-31	royal darwin hospital emergency medicine director	[royal, darwin, hospital, emergency, medicine,	[royal, darwin, hospit, emerg, medicin, director]	[royal, darwin, hospit, emerg, medicin, director]	royal darwin hospit emerg medicin director
2019-12-31	2019-12-31	royal darwin hospital medicine director decrie	[royal, darwin, hospital, medicine, director,	[royal, darwin, hospit, medicin, director, dec	[royal, darwin, hospit, medicin, director, dec	royal darwin hospit medicin director decri ove
2019-12-31	2019-12-31	rural wach livestock handling cup	[rural, wach, livestock, handling, cup]	[rural, wach, livestock, handl, cup]	[rural, wach, livestock, handl, cup]	rural wach livestock handl cup
2019-12-31	2019-12-31	scott morrison offers deepest sympathies after	[scott, morrison, offers, deepest, sympathies,	[scott, morrison, offer, deepest, sympathi, af	[scott, morrison, offer, deepest, sympathi, fi	scott morrison offer deepest sympathi firefigh
2019-12-31	2019-12-31	sudan sentences 29 intelligence agents to deat	[sudan, sentences, 29, intelligence, agents, t	[sudan, sentenc, 29, intellig, agent, to, deat	[sudan, sentenc, 29, intellig, agent, death, h	sudan sentenc 29 intellig agent death hang
2019-12-31	2019-12-31	sydney family flees through the bush after fir	[sydney, family, flees, through, the, bush, af	[sydney, famili, flee, through, the, bush, aft	[sydney, famili, flee, bush, fire, tarbuck, bay]	sydney famili flee bush fire tarbuck bay
2019-12-31	2019-12-31	sydney new years eve fireworks be replaced by	[sydney, new, years, eve, fireworks, be, repla	[sydney, new, year, eve, firework, be, replac,	[sydney, new, year, eve, firework, replac, drone]	sydney new year eve firework replac drone
2019-12-31	2019-12-31	tasmania new years eve guide 2019	[tasmania, new, years, eve, guide, 2019]	[tasmania, new, year, eve, guid, 2019]	[tasmania, new, year, eve, guid, 2019]	tasmania new year eve guid 2019
2019-12-31	2019-12-31	the cop and the criminal mental health ptsd co	[the, cop, and, the, criminal, mental, health,	[the, cop, and, the, crimin, mental, health, p	[cop, crimin, mental, health, ptsd, convers]	cop crimin mental health ptsd convers
2019-12-31	2019-12-31	the fire is engulfing the house: tracey corbin	[the, fire, is, engulfing, the, house, tracey,	[the, fire, is, engulf, the, hous, tracey, cor	[fire, engulf, hous, tracey, corbin]	fire engulf hous tracey corbin
2019-12-31	2019-12-31	these are the top stories of 2019 as decided b	[these, are, the, top, stories, of, 2019, as,	[these, are, the, top, stori, of, 2019, as, de	[top, stori, 2019, decid, abc, news, reader]	top stori 2019 decid abc news reader
2019-12-31	2019-12-31	the year that was 2019 highlights memorable po	[the, year, that, was, 2019, highlights, memor	[the, year, that, wa, 2019, highlight, memor,	[year, wa, 2019, highlight, memor, popular, st	year wa 2019 highlight memor popular stori
2019-12-31	2019-12-31	thousands of residents on standby at mallacoot	[thousands, of, residents, on, standby, at, ma	[thousand, of, resid, on, standbi, at, mallaco	[thousand, resid, standbi, mallacoota, beach]	thousand resid standbi mallacoota beach
2019-12-31	2019-12-31	top stories on abc news	[top, stories, on, abc, news]	[top, stori, on, abc, news]	[top, stori, abc, news]	top stori abc news
2019-12-31	2019-12-31	up to 4000 people are seeking refuge on a beac	[up, to, 4000, people, are, seeking, refuge, o	[up, to, 4000, peopl, are, seek, refug, on, a,	[4000, peopl, seek, refug, beach, mallacoota]	4000 peopl seek refug beach mallacoota
2019-12-31	2019-12-31	victoria bushfire mallacoota residents emergency	[victoria, bushfire, mallacoota, residents, em	[victoria, bushfir, mallacoota, resid, emerg]	[victoria, bushfir, mallacoota, resid, emerg]	victoria bushfir mallacoota resid emerg
2019-12-31	2019-12-31	victoria bushfire trapping people in east gipp	[victoria, bushfire, trapping, people, in, eas	[victoria, bushfir, trap, peopl, in, east, gip	[victoria, bushfir, trap, peopl, east, gippsla	victoria bushfir trap peopl east gippsland liv
2019-12-31	2019-12-31	victorian bushfire emergency mallacoota gippsl	[victorian, bushfire, emergency, mallacoota, g	[victorian, bushfir, emerg, mallacoota, gippsl	[victorian, bushfir, emerg, mallacoota, gippsl	victorian bushfir emerg mallacoota gippsland c
2019-12-31	2019-12-31	vision of flames approaching corryong in victoria	[vision, of, flames, approaching, corryong, in	[vision, of, flame, approach, corryong, in, vi	[vision, flame, approach, corryong, victoria]	vision flame approach corryong victoria
2019-12-31	2019-12-31	wa police and government backflip on drug amne	[wa, police, and, government, backflip, on, dr	[wa, polic, and, govern, backflip, on, drug, a	[wa, polic, govern, backflip, drug, amnesti, bin]	wa polic govern backflip drug amnesti bin
2019-12-31	2019-12-31	we have fears for their safety: victorian premier	[we, have, fears, for, their, safety, victoria	[we, have, fear, for, their, safeti, victorian	[fear, safeti, victorian, premier]	fear safeti victorian premier
2019-12-31	2019-12-31	when do the 20s start	[when, do, the, 20s, start]	[when, do, the, 20, start]	[20, start]	20 start
2019-12-31	2019-12-31	yarraville shooting woman dead man critically	[yarraville, shooting, woman, dead, man, criti	[yarravil, shoot, woman, dead, man, critic, in	[yarravil, shoot, woman, dead, man, critic, in	yarravil shoot woman dead man critic injur

675713 rows × 6 columns

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# Text Analysis libraries
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.pipeline import make_pipeline
 from sklearn.feature_extraction.text import CountVectorizer
 import gensim
 from tqdm import tqdm
tqdm.pandas(desc="progress-bar")
from gensim.models.doc2vec import LabeledSentence
cv = CountVectorizer(stop_words = 'english')
words = cv.fit_transform(Filter_List.processed_convo)
 sum words = words.sum(axis=0)
words\_freq = [(word, sum\_words[\theta, i]) \  \, \textbf{for} \  \, word, \  \, \textbf{i} \  \, \textbf{n} \  \, \text{cv.vocabulary\_.i} \\ words\_freq = sorted(words\_freq, key = \textbf{lambda} \  \, \textbf{x:} \  \, \textbf{x[1]}, \  \, \textbf{reverse} = \textbf{True}) \\
 frequency = pd.DataFrame(words_freq, columns=['word', 'freq'])
frequency.head(20).plot(x='word', y='freq', kind='bar', figsize=(12, 7), color = 'blue')
plt.title("Most Frequently Occuring Words - Top 20")
```

Text(0.5, 1.0, 'Most Frequently Occuring Words - Top 20')



```
def sent_to_words(sentences):
       yield(gensim.utils.simple_preprocess(str(sentence), deacc=True)) # deacc=True removes punctuations
df = list(sent_to_words(Filter_List['processed_convo']))
print(df[:1])
[['dega', 'stolen', 'museum']]
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In [43]:

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vocab = Dictionary(df)
print(vocab.token2id)
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| 1. | Transfer | 1. | Transfe
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| 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 | 1987 |
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| Section | 1987 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988 | 1988
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Section 1987, Contact 1987, April 1987, Section 1987, April 1987,
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TF-IDF

Out[49]:

['dega', 'museum', 'stolen']

The TF-IDF is used because it allowed me to use scoring measure, if the word occurs multiple times in a documnent it allows me to boost its relavance this was implemented because we can easily find out the most relevant topics.

```
#covert the words into bag of words format
corpus = [vocab.doc2bow(words) for words in df]
#Adjusting the tf-idf model to the corpus
model = TfidfModel(corpus)
#apply for the first data
tfidf_doc = model[corpus[0]]
In [45]:
tfidf_doc
Out[45]:
[(0, 0.7721703258664878), (1, 0.4704082108238716), (2, 0.42716402357961525)]
In [46]:
[(vocab[w[0]],w[1]) for w in tfidf_doc]
[('dega', 0.7721703258664878),
('museum', 0.4704082108238716),
('stolen', 0.42716402357961525)]
In [47]:
df[0]
Out[47]:
['dega', 'stolen', 'museum']
In [48]:
#most relevant terms
def get_tfidf(idx):
     term values = [(vocab[el[0]].el[1]) for el in model[corpus[idx]] if el[1]>0]
     srt = sorted(term_values, key = lambda x: x[1], reverse = True return list(map(lambda x: x[0],srt[:5]))
In [49]:
get_tfidf(0)
```

```
In [50]:
Filter_List.reset_index(drop=True, inplace=True)
Filter_List
Out[50]:
```

,	processed_conv	processed_stem	stemmed_words	words	headline_text	publish_date	
	12m dega stolen museur	[12m, dega, stolen, museum]	[12m, dega, stolen, from, museum]	[12m, degas, stolen, from, museum]	12m degas stolen from museum	2010-01-01	0
ı	17 die bangladesh bu cras	[17, die, bangladesh, bu, crash]	[17, die, in, bangladesh, bu, crash]	[17, die, in, bangladesh, bus, crash]	17 die in bangladesh bus crash	2010-01-01	1
i	2010 drier veri wet 200	[2010, drier, veri, wet, 2009]	[2010, to, be, drier, after, veri, wet, 2009]	[2010, to, be, drier, after, very, wet, 2009]	2010 to be drier after very wet 2009	2010-01-01	2
i	37 cathol worker kill worldwi	[37, cathol, worker, kill, worldwid]	[37, cathol, worker, kill, worldwid]	[37, catholic, workers, killed, worldwide]	37 catholic workers killed worldwide	2010-01-01	3
í	600 hurt philippin new year revel	[600, hurt, philippin, new, year, revelri]	[600, hurt, in, philippin, new, year, revelri]	[600, hurt, in, philippine, new, year, revelry]	600 hurt in philippine new year revelry	2010-01-01	4
r	abbott vow turn back asylum seeke	[abbott, vow, turn, back, asylum, seeker]	[abbott, vow, to, turn, back, asylum, seeker]	[abbott, vows, to, turn, back, asylum, seekers]	abbott vows to turn back asylum seekers	2010-01-01	5
ι	accus refus bail deakin brea	[accus, refus, bail, deakin, break]	[accus, refus, bail, over, deakin, break, in]	[accused, refused, bail, over, deakin, break, in]	accused refused bail over deakin break in	2010-01-01	6
ı	agforc oppos great barrier reef ru	[agforc, oppos, great, barrier, reef, run]	f [agforce, opposes, great, barrier, reef, run, run, [agforc, oppos, great, barrier, reef, run, off] [agforce, opposed to the control of		agforce opposes great barrier reef run off	2010-01-01	7
:	airport secur strip bar	[airport, secur, strip, bare]	[airport, secur, strip, bare]	[airport, security, stripped, bare]	airport security stripped bare	2010-01-01	8
ı	alcohol relat injuri flood qld emerg war	[alcohol, relat, injuri, flood, qld, emerg, ward]	[alcohol, relat, injuri, flood, qld, emerg, ward]		alcohol related injuries flood qld	2010-01-01	9

10	2010-01-01	all eyes on belgian comeback queens	[all, eyes, on, belgian, comeback, queens]	[all, eye, on, belgian, comeback, queen]	[eye, belgian, comeback, queen]	eye belgian comeback queen
11	2010-01-01	anger as centrelink fast tracks repayments	[anger, as, centrelink, fast, tracks, repayments]	[anger, as, centrelink, fast, track, repay] [anger, centrelink, fast, track, repay]		anger centrelink fast track repay
12	2010-01-01	another asylum seeker boat intercepted	[another, asylum, seeker, boat, intercepted]	[anoth, asylum, seeker, boat, intercept]	[anoth, asylum, seeker, boat, intercept]	anoth asylum seeker boat intercept
13	2010-01-01	arsenal re signs young gun diaby	[arsenal, re, signs, young, gun, diaby]	[arsen, re, sign, young, gun, diabi]	[arsen, sign, young, gun, diabi]	arsen sign young gun diabi
14	2010-01-01	art exhibit set to boost local economy	[art, exhibit, set, to, boost, local, economy]	[art, exhibit, set, to, boost, local, economi]	[art, exhibit, set, boost, local, economi]	art exhibit set boost local economi
15	2010-01-01	australia brings in 2010 with a bang	[australia, brings, in, 2010, with, a, bang]	[australia, bring, in, 2010, with, a, bang]	[australia, bring, 2010, bang]	australia bring 2010 bang
16	2010-01-01	australias coal addiction set in train 30 year	[australias, coal, addiction, set, in, train,	[australia, coal, addict, set, in, train, 30,	[australia, coal, addict, set, train, 30, year	australia coal addict set train 30 year ago
17	2010-01-01	birt naved save panicking tigers	[birt, naved, save, panicking, tigers]	[birt, nave, save, panick, tiger]	[birt, nave, save, panick, tiger]	birt nave save panick tiger
18	2010-01-01	blanchett extends stay at theatre company	[blanchett, extends, stay, at, theatre, company]	[blanchett, extend, stay, at, theatr, compani]	[blanchett, extend, stay, theatr, compani]	blanchett extend stay theatr compani
19	2010-01-01	blaze leads nbl into 2010	[blaze, leads, nbl, into, 2010]	[blaze, lead, nbl, into, 2010]	[blaze, lead, nbl, 2010]	blaze lead nbl 2010
20 21	2010-01-01	body found inside incinerated car body of diver found off wa	[body, found, inside, incinerated, car] [body, of, diver, found, off, wa]	[bodi, found, insid, inciner, car] [bodi, of, diver, found, off, wa]	[bodi, found, insid, inciner, car] [bodi, diver, found, wa]	bodi found insid inciner car bodi diver found wa
22	2010-01-01	bomb suspect began journey in ghana	[bomb, suspect, began, journey, in,	[bomb, suspect, began, journey, in,	[bomb, suspect, began, journey, ghana]	bomb suspect began journey ghana
			ghana] [boosted, police, presence, after, family,	ghana]		
23	2010-01-01	boosted police presence after family feud	feud]	[boost, polic, presenc, after, famili, feud]	[boost, polic, presenc, famili, feud]	boost polic presenc famili feud
24 25	2010-01-01	boy hit with robbery driving charges brisbane city hall closes for repairs	[boy, hit, with, robbery, driving, charges] [brisbane, city, hall, closes, for, repairs]	[boy, hit, with, robberi, drive, charg] [brisban, citi, hall, close, for, repair]	[boy, hit, robberi, drive, charg] [brisban, citi, hall, close, repair]	boy hit robberi drive charg brisban citi hall close repair
26	2010-01-01	brisbanes demolished bellevue hotel was	[brisbanes, demolished, bellevue, hotel,	[brisban, demolish, bellevu, hotel, wa,	[brisban, demolish, bellevu, hotel, wa,	brisban demolish bellevu hotel wa worth
27	2010-01-01	worth bushranger bravo eyes revenge of his own	was, [bushranger, bravo, eyes, revenge, of,	worth] [bushrang, bravo, eye, reveng, of, hi,	worth] [bushrang, bravo, eye, reveng, hi]	bushrang bravo eye reveng hi
		cabinet papers show bjelke petersen	his, own] [cabinet, papers, show, bjelke, petersen,	own] [cabinet, paper, show, bjelk, petersen,	[cabinet, paper, show, bjelk, petersen,	cabinet paper show bjelk petersen
28	2010-01-01	contemplated	cont	contempl]	contempl]	contempl
29 	2010-01-01	cabinet secrets from 1979 released	[cabinet, secrets, from, 1979, released]	[cabinet, secret, from, 1979, releas]	[cabinet, secret, 1979, releas]	cabinet secret 1979 releas
675683	2019-12-31	nsw bushfires cobargo fire destroys towns main	[nsw, bushfires, cobargo, fire, destroys, town	[nsw, bushfir, cobargo, fire, destroy, town, m	[nsw, bushfir, cobargo, fire, destroy, town, m	nsw bushfir cobargo fire destroy town main street
675684	2019-12-31	nsw south coast fires rfs emergency warnings	[nsw, south, coast, fires, rfs, emergency, war	[nsw, south, coast, fire, rf, emerg, warn]	[nsw, south, coast, fire, rf, emerg, warn]	nsw south coast fire rf emerg warn
675685	2019-12-31	numerous structures burnt in clifton creek	[numerous, structures, burnt, in, clifton,	[numer, structur, burnt, in, clifton, creek,	[numer, structur, burnt, clifton, creek,	numer structur burnt clifton creek victoria
		vic properties and livestock lost following	cre [properties, and, livestock, lost,	v [properti, and, livestock, lost, follow,	victo [properti, livestock, lost, follow, bushfir,	properti livestock lost follow bushfir
675686	2019-12-31	bushfi	following,	bushf	a	across sa
675687	2019-12-31	relax australian kids are doing just fine	[relax, australian, kids, are, doing, just, fine]	[relax, australian, kid, are, do, just, fine]	[relax, australian, kid, fine]	relax australian kid fine
675688	2019-12-31	rfs volunteer firefighter dies in truck rollover	[rfs, volunteer, firefighter, dies, in, truck,	[rf, volunt, firefight, die, in, truck, rollov]	[rf, volunt, firefight, die, truck, rollov]	rf volunt firefight die truck rollov
675689	2019-12-31	risky decision nearly cost ian munro his life	[risky, decision, nearly, cost, ian, munro, hi	[riski, decis, nearli, cost, ian, munro, hi, I	[riski, decis, nearli, cost, ian, munro, hi, l	riski decis nearli cost ian munro hi life
675690	2019-12-31	royal darwin hospital emergency medicine director	[royal, darwin, hospital, emergency, medicine,	[royal, darwin, hospit, emerg, medicin, director]	[royal, darwin, hospit, emerg, medicin, director]	royal darwin hospit emerg medicin director
675691	2019-12-31	royal darwin hospital medicine director decrie	[royal, darwin, hospital, medicine, director,	[royal, darwin, hospit, medicin, director, dec	[royal, darwin, hospit, medicin, director, dec	royal darwin hospit medicin director decri ove
675692	2019-12-31	rural wach livestock handling cup	[rural, wach, livestock, handling, cup]	[rural, wach, livestock, handl, cup]	[rural, wach, livestock, handl, cup]	rural wach livestock handl cup
675693	2019-12-31	scott morrison offers deepest sympathies after	[scott, morrison, offers, deepest, sympathies,	[scott, morrison, offer, deepest, sympathi, af	[scott, morrison, offer, deepest, sympathi, fi	scott morrison offer deepest sympathi firefigh
675694	2019-12-31	sudan sentences 29 intelligence agents to deat	[sudan, sentences, 29, intelligence, agents, t	[sudan, sentenc, 29, intellig, agent, to, deat	[sudan, sentenc, 29, intellig, agent, death, h	sudan sentenc 29 intellig agent death hang
675695	2019-12-31	sydney family flees through the bush after fir	[sydney, family, flees, through, the, bush, af $$\operatorname{af}$$	[sydney, famili, flee, through, the, bush, aft	[sydney, famili, flee, bush, fire, tarbuck, bay]	sydney famili flee bush fire tarbuck bay
675696	2019-12-31	sydney new years eve fireworks be replaced by	[sydney, new, years, eve, fireworks, be, repla	[sydney, new, year, eve, firework, be, replac,	[sydney, new, year, eve, firework, replac, drone]	sydney new year eve firework replac drone
675697	2019-12-31	tasmania new years eve guide 2019	[tasmania, new, years, eve, guide, 2019]	[tasmania, new, year, eve, guid, 2019]	[tasmania, new, year, eve, guid, 2019]	tasmania new year eve guid 2019
675698	2019-12-31	the cop and the criminal mental health ptsd co	[the, cop, and, the, criminal, mental, health,	[the, cop, and, the, crimin, mental, health, $p \label{eq:power_power} p$	[cop, crimin, mental, health, ptsd, convers]	cop crimin mental health ptsd convers
675699	2019-12-31	the fire is engulfing the house: tracey corbin	[the, fire, is, engulfing, the, house, tracey,	[the, fire, is, engulf, the, hous, tracey, cor	[fire, engulf, hous, tracey, corbin]	fire engulf hous tracey corbin
675700	2019-12-31	these are the top stories of 2019 as decided b	[these, are, the, top, stories, of, 2019, as,	[these, are, the, top, stori, of, 2019, as, de	[top, stori, 2019, decid, abc, news, reader]	top stori 2019 decid abc news reader
675701	2019-12-31	the year that was 2019 highlights memorable po	[the, year, that, was, 2019, highlights, memor	[the, year, that, wa, 2019, highlight, memor,	[year, wa, 2019, highlight, memor, popular, st	year wa 2019 highlight memor popular stori
675702	2019-12-31	thousands of residents on standby at mallacoot	[thousands, of, residents, on, standby, at, ma	[thousand, of, resid, on, standbi, at, mallaco	[thousand, resid, standbi, mallacoota, beach]	thousand resid standbi mallacoota beach
675703	2019-12-31	top stories on abc news	[top, stories, on, abc, news]	[top, stori, on, abc, news]	[top, stori, abc, news]	top stori abc news
675704	2019-12-31	up to 4000 people are seeking refuge on a beac	[up, to, 4000, people, are, seeking, refuge, o	[up, to, 4000, peopl, are, seek, refug, on, $$a,\!\!\ldots$	[4000, peopl, seek, refug, beach, mallacoota]	4000 peopl seek refug beach mallacoota
675705	2019-12-31	victoria bushfire mallacoota residents emergency	[victoria, bushfire, mallacoota, residents, em	[victoria, bushfir, mallacoota, resid, emerg]	[victoria, bushfir, mallacoota, resid, emerg]	victoria bushfir mallacoota resid emerg
675706	2019-12-31	victoria bushfire trapping people in east gipp	[victoria, bushfire, trapping, people, in, eas	[victoria, bushfir, trap, peopl, in, east, gip	[victoria, bushfir, trap, peopl, east, gippsla	victoria bushfir trap peopl east gippsland liv
675707	2019-12-31	victorian bushfire emergency mallacoota gippsl	[victorian, bushfire, emergency, mallacoota, g	[victorian, bushfir, emerg, mallacoota, gippsl	[victorian, bushfir, emerg, mallacoota, gippsl	victorian bushfir emerg mallacoota gippsland c
675708	2019-12-31	vision of flames approaching corryong in victoria	[vision, of, flames, approaching, corryong, in	[vision, of, flame, approach, corryong, in, vi	[vision, flame, approach, corryong, victoria]	vision flame approach corryong victoria
675709	2019-12-31	wa police and government backflip on drug amne	[wa, police, and, government, backflip, on, dr	[wa, polic, and, govern, backflip, on, drug, a	[wa, polic, govern, backflip, drug, amnesti, bin]	wa polic govern backflip drug amnesti bin
675710	2019-12-31	we have fears for their safety: victorian premier	[we, have, fears, for, their, safety, victoria	[we, have, fear, for, their, safeti, victorian	[fear, safeti, victorian, premier]	fear safeti victorian premier
675711	2019-12-31	when do the 20s start	[when, do, the, 20s, start]	[when, do, the, 20, start]	[20, start]	20 start
675712	2019-12-31	yarraville shooting woman dead man critically	[yarraville, shooting, woman, dead, man, criti	[yarravil, shoot, woman, dead, man, critic, in	[yarravil, shoot, woman, dead, man, critic, in	yarravil shoot woman dead man critic injur

675713 rows × 6 columns

In [51]:

Filter_List['tfidf'] = Filter_List.index.map(get_tfidf)
Filter_List

	publish_date	headline_text	words	stemmed_words	processed_stem	processed_convo	tfidf
	2010-01-01	12m degas stolen from museum	[12m, degas, stolen, from,	[12m, dega, stolen, from,	[12m, dega, stolen, museum]	12m dega stolen museum	[dega, museum, stolen]
1	2010-01-01	-	museum] [17, die, in, bangladesh, bus,	museum] [17, die, in, bangladesh, bu,			[bangladesh, bu, die, crash]
		17 die in bangladesh bus crash	crash] [2010, to, be, drier, after, very,	crash] [2010, to, be, drier, after, veri, wet,	[17, die, bangladesh, bu, crash]	17 die bangladesh bu crash	
2	2010-01-01	2010 to be drier after very wet 2009	wet, 2009]	2009]	[2010, drier, veri, wet, 2009]	2010 drier veri wet 2009	[drier, veri, wet]
3	2010-01-01	37 catholic workers killed worldwide	[37, catholic, workers, killed, worldwide]	[37, cathol, worker, kill, worldwid]	[37, cathol, worker, kill, worldwid]	37 cathol worker kill worldwid	[worldwid, cathol, worker, kill]
4	2010-01-01	600 hurt in philippine new year revelry	[600, hurt, in, philippine, new, year, revelry]	[600, hurt, in, philippin, new, year, revelri]	[600, hurt, philippin, new, year, revelri]	600 hurt philippin new year revelri	[revelri, philippin, hurt, year, new]
5	2010-01-01	abbott vows to turn back asylum seekers	[abbott, vows, to, turn, back, asylum, seekers]	[abbott, vow, to, turn, back, asylum, seeker]	[abbott, vow, turn, back, asylum, seeker]	abbott vow turn back asylum seeker	[vow, seeker, turn, asylum, abbott]
6	2010-01-01	accused refused bail over deakin break in	[accused, refused, bail, over, deakin, break, in]	[accus, refus, bail, over, deakin, break, in]	[accus, refus, bail, deakin, break]	accus refus bail deakin break	[deakin, refus, bail, break, accus]
7	2010-01-01	agforce opposes great barrier reef run off	[agforce, opposes, great, barrier, reef, run,	[agforc, oppos, great, barrier, reef, run, off]	[agforc, oppos, great, barrier, reef, run]	agforc oppos great barrier reef run	[agforc, oppos, barrier, reef, great]
8	2010-01-01	airport security stripped bare	[airport, security, stripped, bare]	[airport, secur, strip, bare]	[airport, secur, strip, bare]	airport secur strip bare	[bare, strip, airport, secur]
9	2010-01-01	alcohol related injuries flood qld emergency w	[alcohol, related, injuries, flood, qld, emerg	[alcohol, relat, injuri, flood, qld, emerg, ward]	[alcohol, relat, injuri, flood, qld, emerg, ward]	alcohol relat injuri flood qld emerg ward	[ward, relat, alcohol, injuri, emerg]
10	2010-01-01	all eyes on belgian comeback queens	[all, eyes, on, belgian, comeback, queens]	[all, eye, on, belgian, comeback, queen]	[eye, belgian, comeback, queen]	eye belgian comeback queen	[belgian, comeback, queen, eye]
11	2010-01-01	anger as centrelink fast tracks repayments	[anger, as, centrelink, fast, tracks, repayments]	[anger, as, centrelink, fast, track, repay]	[anger, centrelink, fast, track, repay]	anger centrelink fast track repay	[repay, centrelink, fast, anger, track]
12	2010-01-01	another asylum seeker boat intercepted	[another, asylum, seeker, boat, intercepted]	[anoth, asylum, seeker, boat, intercept]	[anoth, asylum, seeker, boat, intercept]	anoth asylum seeker boat intercept	[intercept, anoth, seeker, boat, asylum]
13	2010-01-01	arsenal re signs young gun diaby	[arsenal, re, signs, young, gun, diaby]	[arsen, re, sign, young, gun, diabi]	[arsen, sign, young, gun, diabi]	arsen sign young gun diabi	[diabi, arsen, gun, young, sign]
14	2010-01-01	art exhibit set to boost local	[art, exhibit, set, to, boost, local,	[art, exhibit, set, to, boost, local,	[art, exhibit, set, boost, local,	art exhibit set boost local economi	[exhibit, economi, art, local,
15	2010-01-01	economy australia brings in 2010 with a bang	economy] [australia, brings, in, 2010, with,	economi] [australia, bring, in, 2010, with, a,	economi] [australia, bring, 2010, bang]	australia bring 2010 bang	boost] [bang, bring, australia]
		australias coal addiction set in train	a, bang] [australias, coal, addiction, set,	bang] [australia, coal, addict, set, in,	[australia, coal, addict, set, train,	australia coal addict set train 30	
16	2010-01-01	30 year	in, train, [birt, naved, save, panicking,	train, 30,	30, year	year ago	[ago, addict, coal, train, set]
17	2010-01-01	birt naved save panicking tigers	tigers]	[birt, nave, save, panick, tiger]	[birt, nave, save, panick, tiger]	birt nave save panick tiger	[nave, birt, panick, tiger, save]
18	2010-01-01	blanchett extends stay at theatre company	[blanchett, extends, stay, at, theatre, company]	[blanchett, extend, stay, at, theatr, compani]	[blanchett, extend, stay, theatr, compani]	blanchett extend stay theatr compani	[blanchett, theatr, stay, extend, compani]
19	2010-01-01	blaze leads nbl into 2010	[blaze, leads, nbl, into, 2010]	[blaze, lead, nbl, into, 2010]	[blaze, lead, nbl, 2010]	blaze lead nbl 2010	[nbl, blaze, lead]
20	2010-01-01	body found inside incinerated car	[body, found, inside, incinerated, car]	[bodi, found, insid, inciner, car]	[bodi, found, insid, inciner, car]	bodi found insid inciner car	[inciner, insid, bodi, found, car]
21	2010-01-01	body of diver found off wa bomb suspect began journey in	[body, of, diver, found, off, wa] [bomb, suspect, began, journey,	[bodi, of, diver, found, off, wa] [bomb, suspect, began, journey,	[bodi, diver, found, wa] [bomb, suspect, began, journey,	bodi diver found wa bomb suspect began journey	[diver, bodi, found, wa] [began, ghana, journey, suspect,
22	2010-01-01	ghana	in, ghana]	in, ghana]	ghana]	ghana	bomb]
23	2010-01-01	boosted police presence after family feud	[boosted, police, presence, after, family, feud]	[boost, polic, presenc, after, famili, feud]	[boost, polic, presenc, famili, feud]	boost polic presenc famili feud	[presenc, feud, boost, famili, polic]
24	2010-01-01	boy hit with robbery driving charges	[boy, hit, with, robbery, driving, charges]	[boy, hit, with, robberi, drive, charg]	[boy, hit, robberi, drive, charg]	boy hit robberi drive charg	[robberi, drive, boy, hit, charg]
25	2010-01-01	brisbane city hall closes for repairs	[brisbane, city, hall, closes, for, repairs]	[brisban, citi, hall, close, for, repair]	[brisban, citi, hall, close, repair]	brisban citi hall close repair	[repair, hall, citi, close, brisban]
26	2010-01-01	brisbanes demolished bellevue hotel was worth	[brisbanes, demolished, bellevue, hotel, was,	[brisban, demolish, bellevu, hotel, wa, worth]	[brisban, demolish, bellevu, hotel, wa, worth]	brisban demolish bellevu hotel wa worth	[bellevu, demolish, worth, hotel, brisban]
27	2010-01-01	bushranger bravo eyes revenge of his own	[bushranger, bravo, eyes, revenge, of, his, own]	[bushrang, bravo, eye, reveng, of, hi, own]	[bushrang, bravo, eye, reveng, hi]	bushrang bravo eye reveng hi	[bravo, reveng, bushrang, eye, hi]
28	2010-01-01	cabinet papers show bjelke petersen contemplated	[cabinet, papers, show, bjelke, petersen, cont	[cabinet, paper, show, bjelk, petersen, contempt]	[cabinet, paper, show, bjelk, petersen, contempt]	cabinet paper show bjelk petersen contempl	[bjelk, petersen, contempl, paper, cabinet]
29	2010-01-01	cabinet secrets from 1979 released	[cabinet, secrets, from, 1979, released]	[cabinet, secret, from, 1979,	[cabinet, secret, 1979, releas]	cabinet secret 1979 releas	[cabinet, secret, releas]
675683	2019-12-31	nsw bushfires cobargo fire destroys towns main	[nsw, bushfires, cobargo, fire, destroys, town	[nsw, bushfir, cobargo, fire, destroy, town, m	[nsw, bushfir, cobargo, fire, destroy, town, m	nsw bushfir cobargo fire destroy town main street	[cobargo, main, destroy, street, town]
675684	2019-12-31	nsw south coast fires rfs emergency warnings	[nsw, south, coast, fires, rfs, emergency, war	[nsw, south, coast, fire, rf, emerg, warn]	[nsw, south, coast, fire, rf, emerg, warn]	nsw south coast fire rf emerg warn	[rf, emerg, coast, south, warn]
675685	2019-12-31	numerous structures burnt in clifton creek vic	[numerous, structures, burnt, in, clifton, cre	[numer, structur, burnt, in, clifton, creek, v	[numer, structur, burnt, clifton, creek, victo	numer structur burnt clifton creek victoria	[numer, clifton, structur, burnt, creek]
675686	2019-12-31	properties and livestock lost following bushfi	[properties, and, livestock, lost, following,	[properti, and, livestock, lost, follow, bushf	[properti, livestock, lost, follow, bushfir, a	properti livestock lost follow bushfir across sa	[livestock, lost, across, follow, properti]
675687	2019-12-31	relax australian kids are doing just	[relax, australian, kids, are,	[relax, australian, kid, are, do, just,	[relax, australian, kid, fine]	relax australian kid fine	[relax, kid, fine, australian]
675688	2019-12-31	fine rfs volunteer firefighter dies in truck	doing, just, fine] [rfs, volunteer, firefighter, dies, in,	fine] [rf, volunt, firefight, die, in, truck,	[rf, volunt, firefight, die, truck,	rf volunt firefight die truck rollov	[rollov, rf, volunt, firefight, truck]
675689	2019-12-31	rollover risky decision nearly cost ian munro	truck, [risky, decision, nearly, cost, ian,	rollov] [riski, decis, nearli, cost, ian,	rollov] [riski, decis, nearli, cost, ian,	riski decis nearli cost ian munro hi	[munro, riski, nearli, ian, decis]
		his life royal darwin hospital emergency	munro, hi [royal, darwin, hospital,	munro, hi, l [royal, darwin, hospit, emerg,	munro, hi, l [royal, darwin, hospit, emerg,	life royal darwin hospit emerg medicin	[medicin, director, emerg, darwin,
675690	2019-12-31	medicine director	emergency, medicine,	medicin, director] [royal, darwin, hospit, medicin,	medicin, director] [royal, darwin, hospit, medicin,	director	royal] [decri, overcrowd, medicin,
675691	2019-12-31	director decrie	director, [rural, wach, livestock, handling,	director, dec	director, dec	director decri ove	director, darwin]
675692	2019-12-31	rural wach livestock handling cup	cup]	[rural, wach, livestock, handl, cup]	[rural, wach, livestock, handl, cup]		[wach, handl, livestock, cup, rural]
675693	2019-12-31	scott morrison offers deepest sympathies after	[scott, morrison, offers, deepest, sympathies,	[scott, morrison, offer, deepest, sympathi, af	[scott, morrison, offer, deepest, sympathi, fi	scott morrison offer deepest sympathi firefigh	[deepest, sympathi, morrison, firefight, scott]
675694	2019-12-31	sudan sentences 29 intelligence agents to deat	[sudan, sentences, 29, intelligence, agents, t	[sudan, sentenc, 29, intellig, agent, to, deat	[sudan, sentenc, 29, intellig, agent, death, h	sudan sentenc 29 intellig agent death hang	[sudan, intellig, agent, hang, sentenc]
675695	2019-12-31	sydney family flees through the bush after fir	[sydney, family, flees, through, the, bush, af	[sydney, famili, flee, through, the, bush, aft	[sydney, famili, flee, bush, fire, tarbuck, bay]	sydney famili flee bush fire tarbuck bay	[tarbuck, flee, bush, bay, famili]
675696	2019-12-31	sydney new years eve fireworks be replaced by	[sydney, new, years, eve, fireworks, be, repla	[sydney, new, year, eve, firework, be, replac,	[sydney, new, year, eve, firework, replac, drone]	sydney new year eve firework replac drone	[firework, eve, replac, drone, sydney]
675697	2019-12-31	tasmania new years eve guide 2019	[tasmania, new, years, eve, guide, 2019]	[tasmania, new, year, eve, guid, 2019]	[tasmania, new, year, eve, guid, 2019]	tasmania new year eve guid 2019	[eve, guid, tasmania, year, new]
675698	2019-12-31	the cop and the criminal mental health ptsd co	[the, cop, and, the, criminal, mental, health,	[the, cop, and, the, crimin, mental, health, p	[cop, crimin, mental, health, ptsd, convers]	cop crimin mental health ptsd	[ptsd, convers, crimin, cop, mental]
675699	2019-12-31	the fire is engulfing the house:	[the, fire, is, engulfing, the, house,	[the, fire, is, engulf, the, hous,	[fire, engulf, hous, tracey, corbin]	fire engulf hous tracey corbin	[corbin, tracey, engulf, hous, fire]
675700	2019-12-31	tracey corbin these are the top stories of 2019 as	tracey, [these, are, the, top, stories, of,	tracey, cor [these, are, the, top, stori, of,	[top, stori, 2019, decid, abc, news,	top stori 2019 decid abc news	[reader, decid, stori, top, news]
		decided b the year that was 2019 highlights	2019, as, [the, year, that, was, 2019,	2019, as, de [the, year, that, wa, 2019,	reader] [year, wa, 2019, highlight, memor,	reader year wa 2019 highlight memor	[memor, popular, highlight, stori,
675701	2019-12-31	memorable po thousands of residents on standby	highlights, memor [thousands, of, residents, on,	highlight, memor, [thousand, of, resid, on, standbi,	popular, st [thousand, resid, standbi,	popular stori thousand resid standbi mallacoota	year] [mallacoota, standbi, thousand,
675702	2019-12-31	at mallacoot	standby, at, ma	at, mallaco	mallacoota, beach]	beach	beach, resid]
675703 675704	2019-12-31	top stories on abc news up to 4000 people are seeking	[top, stories, on, abc, news]	[top, stori, on, abc, news] [up, to, 4000, peopl, are, seek,	[top, stori, abc, news] [4000, peopl, seek, refug, beach,	top stori abc news 4000 peopl seek refug beach	[stori, top, news, abc] [mallacoota, refug, beach, seek,
515104	2010-12-01	refuge on a beac	seeking, refuge, o	refug, on, a,	mallacoota]	mallacoota	peopl]

675705	2019-12-31	victoria bushfire mallacoota residents emergency	[victoria, bushfire, mallacoota, residents, em	[victoria, bushfir, mallacoota, resid, emerg]	[victoria, bushfir, mallacoota, resid, emerg]	victoria bushfir mallacoota resid emerg	[mallacoota, emerg, victoria, bushfir, resid]
675706	2019-12-31	victoria bushfire trapping people in east gipp	[victoria, bushfire, trapping, people, in, eas	[victoria, bushfir, trap, peopl, in, east, gip	[victoria, bushfir, trap, peopl, east, gippsla	victoria bushfir trap peopl east gippsland liv	[trap, gippsland, blog, east, victoria]
675707	2019-12-31	victorian bushfire emergency mallacoota gippsl	[victorian, bushfire, emergency, mallacoota, g	[victorian, bushfir, emerg, mallacoota, gippsl	[victorian, bushfir, emerg, mallacoota, gippsl	victorian bushfir emerg mallacoota gippsland c	[corryong, mallacoota, gippsland, emerg, victo
675708	2019-12-31	vision of flames approaching corryong in victoria	[vision, of, flames, approaching, corryong, in	[vision, of, flame, approach, corryong, in, vi	[vision, flame, approach, corryong, victoria]	vision flame approach corryong victoria	[corryong, flame, vision, approach, victoria]
675709	2019-12-31	wa police and government backflip on drug amne	[wa, police, and, government, backflip, on, dr	[wa, polic, and, govern, backflip, on, drug, a	[wa, polic, govern, backflip, drug, amnesti, bin]	wa polic govern backflip drug amnesti bin	[backflip, amnesti, bin, drug, govern]
675710	2019-12-31	we have fears for their safety: victorian premier	[we, have, fears, for, their, safety, victoria	[we, have, fear, for, their, safeti, victorian	[fear, safeti, victorian, premier]	fear safeti victorian premier	[victorian, safeti, premier, fear]
675711	2019-12-31	when do the 20s start	[when, do, the, 20s, start]	[when, do, the, 20, start]	[20, start]	20 start	[start]
675712	2019-12-31	yarraville shooting woman dead	[yarraville, shooting, woman, dead, man, criti	[yarravil, shoot, woman, dead,	[yarravil, shoot, woman, dead,	yarravil shoot woman dead man	[yarravil, critic, injur, shoot, dead]

675713 rows × 7 columns

In [53]:

```
Filter_List.iloc[2]
```

Out[53]:

publish_date
headline_text
words
stemmed_words
processed_stem
processed_convotfidf
Name: 2, dtype: object

2010 to be drier after very wet 2009
[2010, to, be, drier, after, very, wet, 2009]
[2010, to, be, drier, after, veri, wet, 2009]
[2010, drier, veri, wet, 2009]
[2010, drier veri wet 2009]
[2010, drier, veri, wet, 2009]

LDA

To discover the topics that are abstract and occur in a collection of document is know as topic modeling and LDA is an example of one such Topic modeling, with LDA we can classify a text in a document to a paticular topic, with the help of the LDA i have build a topic per document and word per topic model as distributions of dirichelt.

In [54]:

```
#create an lda
lda_model = LdaModel(corpus=corpus,id2word=vocab, num_topics=20)
lda_model
```

Out[54]:

<gensim.models.ldamodel.LdaModel at 0x1fe8eda84e0>

In [55]:

```
#view the model topics
for topic in lda_model.show_topics(num_topics=20, num_words=15):
    print("Topic"+str(topic[0])+"\n"+topic[1]+"\n")
```

```
Topic0
0.063*"kill" + 0.042*"test" + 0.038*"whi" + 0.038*"coast" + 0.035*"crash" + 0.034*"trial" + 0.033*"scott" + 0.029*"abus" + 0.028*"releas" + 0.025*"gold" + 0.024*"video" + 0.024*"road" + 0.021*"go" + 0.019*"mother" + 0.019*"campaign"
1091C1 0.060*"hit" + 0.056*"women" + 0.042*"sentenc" + 0.040*"farmer" + 0.037*"may" + 0.028*"mine" + 0.027*"servic" + 0.026*"citi" + 0.025*"health" + 0.025*"forc" + 0.025*"fear" + 0.024*"support" + 0.022*"rule" + 0.019*"cost" + 0.018*"lawyer"
Topic2
0.086*"sydney" + 0.057*"win" + 0.051*"abc" + 0.035*"plan" + 0.027*"talk" + 0.026*"drug" + 0.026*"commun" + 0.025*"big" + 0.024*"polit" + 0.024*"reveal" + 0.021*"white" + 0.019*"council" + 0.018*"give" + 0.016*"thi" + 0.016*"green"
0.081*"year" + 0.061*"queensland" + 0.052*"melbourn" + 0.051*"protest" + 0.046*"report" + 0.034*"ha" + 0.028*"qld" + 0.024*"farm" + 0.022*"turn" + 0.021*"old" + 0.020*"say" + 0.020*"need" + 0.018*"violenc" + 0.016*"india" + 0.016*"burn"
0.077*"fire" + 0.046*"hous" + 0.042*"adelaid" + 0.041*"south" + 0.041*"help" + 0.033*"record" + 0.030*"use" + 0.028*"indigen" + 0.024*"student" + 0.024*"set" + 0.024*"worker" + 0.022*"fund" + 0.022*"presid" + 0.021*"west" + 0.020*"alan"
Topic5
0.034*"sex" + 0.034*"law" + 0.034*"case" + 0.034*"guilti" + 0.033*"drought" + 0.032*"life" + 0.031*"child" + 0.029*"leav" + 0.029*"game" + 0.025*"hear" + 0.02
2*"like" + 0.020*"look" + 0.020*"rural" + 0.018*"peter" + 0.017*"plead"
2*"like"
0.110**usstralian" + 0.073*"elect" + 0.056*"govern" + 0.051*"home" + 0.047*"famili" + 0.031*"brisban" + 0.029*"cut" + 0.022*"john" + 0.021*"rescu" + 0.020*"bo di" + 0.017*"question" + 0.017*"weather" + 0.015*"appeal" + 0.015*"plane" + 0.015*"amid"
Topic7
0.079*"wa" + 0.043*"live" + 0.042*"two" + 0.042*"back" + 0.038*"take" + 0.033*"warn" + 0.033*"time" + 0.031*"hi" + 0.030*"war" + 0.029*"hong" + 0.029*"kong" + 0.025*"emerg" + 0.022*"want" + 0.022*"bact" + 0.018*"issu"
0.0804*"polic" + 0.080*"say" + 0.059*"call" + 0.057*"death" + 0.035*"attack" + 0.029*"investig" + 0.028*"victim" + 0.025*"tasmanian" + 0.025*"age" + 0.024*"off ic" + 0.019*"victorian" + 0.019*"young" + 0.019*"leader" + 0.018*"sexual" + 0.018*"media"
0.099*"us" + 0.038*"street" + 0.037*"ban" + 0.031*"children" + 0.079*"wall" + 0.079*"care" + 0.077*"review" + 0.026*"save" + 0.025*"tax" + 0.021*"land" + 0.01
8*"season" + 0.018*"river" + 0.018*"art" + 0.018*"port"
                                                                                + 0.017*"delay'
Topic10
% 0.078*"new" + 0.070*"news" + 0.038*"alleg" + 0.036*"state" + 0.032*"work" + 0.031*"claim" + 0.028*"bill" + 0.028*"trade" + 0.027*"deal" + 0.025*"meet" + 0.024 *"announc" + 0.023*"parliament" + 0.021*"insid" + 0.020*"zealand" + 0.019*"aborigin"
0.051*"canberra" + 0.047*"nation" + 0.047*"show" + 0.045*"royal" + 0.043*"top" + 0.043*"peopl" + 0.038*"hospit" + 0.031*"return" + 0.029*"babi" + 0.026*"park" + 0.025*"break" + 0.021*"star" + 0.018*"leagu" + 0.018*"push"
0.083*"man" + 0.056*"charg" + 0.052*"murder" + 0.042*"woman" + 0.041*"die" + 0.040*"found" + 0.033*"polic" + 0.032*"jail" + 0.032*"car" + 0.030*"accus" + 0.028*"miss" + 0.026*"former" + 0.026*"arrest" + 0.020*"end" + 0.020*"driver"
Topic13
0.100*"nsw" + 0.044*"shoot" + 0.036*"power" + 0.028*"town" + 0.028*"parti" + 0.027*"dead" + 0.025*"week" + 0.024*"flood" + 0.022*"play" + 0.021*"fine" + 0.020
*"footag" + 0.020*"five" + 0.019*"result" + 0.017*"outback" + 0.016*"st"
0.062*"risk" + 0.022*"hobart" + 0.021*"race" + 0.018*"right" + 0.016*"run" + 0.040*"open" + 0.040*"nt" + 0.033*"bank" + 0.033*"fight" + 0.026*"run" + 0.022*"risk" + 0.022*"hobart" + 0.021*"race" + 0.018*"right" + 0.016*"battl"
Topic15
10pil:3
0.070*"bushfir" + 0.047*"get" + 0.044*"morrison" + 0.030*"cricket" + 0.028*"christma" + 0.027*"job" + 0.024*"resid" + 0.022*"continu" + 0.021*"dure" + 0.019*"
threaten" + 0.018*"stop" + 0.017*"secur" + 0.017*"georg" + 0.016*"threat" + 0.016*"cyclon"
0.155*"australia" + 0.065*"day" + 0.052*"one" + 0.049*"first" + 0.030*"victoria" + 0.027*"dog" + 0.024*"region" + 0.024*"three" + 0.024*"train" + 0.020*"second" + 0.019*"build" + 0.018*"andrew" + 0.018*"johnson" + 0.015*"debat" + 0.015*"america"
10,058*"feder" + 0.046*"sa" + 0.045*"north" + 0.045*"final" + 0.037*"commiss" + 0.032*"prison" + 0.031*"interview" + 0.027*"michael" + 0.027*"ash" + 0.025*"sto
rm" + 0.024*"close" + 0.022*"northern" + 0.022*"david" + 0.021*"korea" + 0.020*"compani
Topic18
0.046*"school" + 0.041*"make" + 0.040*"perth" + 0.039*"labor" + 0.037*"island" + 0.037*"find" + 0.033*"high" + 0.030*"rise" + 0.030*"chines" + 0.029*"price" + 0.028*"rate" + 0.028*"fall" + 0.027*"million" + 0.023*"vote" + 0.023*"pay"
0.071*"world" + 0.059*"chang" + 0.045*"cup" + 0.045*"water" + 0.042*"could" + 0.037*"speak" + 0.036*"climat" + 0.034*"busi" + 0.032*"minist" + 0.024*"industri" + 0.019*"say" + 0.018*"food" + 0.017*"still" + 0.016*"local" + 0.016*"crisi"
In [220]:
doc = Filter_List['headline_text'][1]
print("doc:\n",doc)
doc_topics = lda_model.get_document_topics(corpus[1],minimum_probability=0.1)
print("doc_topics:\n",doc_topics)
for topic in doc_topics:
    terms = [term for term, prob in lda_model.show_topic(topic[0])]
     print(terms)
doc:
17 die in bangladesh bus crash
In the init basis of the doc_topics:

[(4, 0.20764288), (7, 0.2122265), (8, 0.41012448)]

['polic', 'man', 'death', 'attack', 'famili', 'court', 'crash', 'car', 'shoot', 'arrest']

['elect', 'charg', 'murder', 'die', 'woman', 'face', 'take', 'labor', 'sex', 'man']

['fire', 'year', 'hous', 'sa', 'hong', 'kong', 'jail', 'victoria', 'chines', 'price']
In [56]:
def get_topic_terms(idx):
     dec_topics = lda_model.get_document_topics(corpus[idx])
top_topic = doc_topics[0]
      return[term for term, prob in lda_model.show_topic(top_topic[0])]
In [57]:
get_topic_terms(1)
```

```
Out[57]:
```

```
['kill',
  'test',
 'whi',
'coast',
  'crash'
  'trial'
  'scott',
  'releas'.
 'gold']
```

```
#Filter_List['lda'] = Filter_List.index.map(get_topic_terms)
#Filter_list
```

VISUALIASATION

In the below diagram i have developed an interactive topic model visualization, with the pyLDAvis the stakeholders can interact with the topics presented i the topic model, which has be set to a corpus of the text data

In [59]:

```
pyLDAvis.enable_notebook()
vis = pyLDAvis.gensim.prepare(lda_model, corpus, vocab)
vis
```

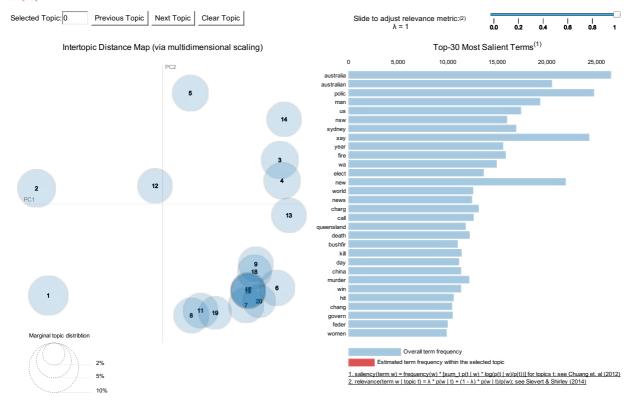
C:\Users\karth\Anaconda3\lib\site-packages\pyLDAvis_prepare.py:257: FutureWarning: Sorting because non-concatenation axis is not aligned. A future version of pandas will change to not sort by default.

To accept the future behavior, pass 'sort=False'.

To retain the current behavior and silence the warning, pass 'sort=True'.

return pd.concat([default_term_info] + list(topic_dfs))

Out[59]:



Creating the wordcloud will help in better understanding of the words that were used and based on the below words we can conclude the top conversation in australia over the last decade

In [185]:

```
vis_abc_df = ','.join(map(str,list(Filter_List['processed_convo'].values)))
wordcloud = WordCloud(background_color = "white",max_words=50,contour_width=6,contour_color='steelblue')
wordcloud.generate(vis_abc_df)
wordcloud.to_image()
```

Out[185]:



SUMMARY

The process of this analysis is based around answering the question. hence, to analyze the question i have divided the question into two parts. in the above analysis i have found out the top topic over the last decade and displayed them in the form of wordcloud.furthermore, to achieve this i implemented some of the text analysis process and topic modeling.fristly, i collected the data from kaggle.com the link provided for the question 3 in assignment 1 part b. then examined the dataset by checking the shape and layout. then i checked the dataset for any null values present in the dataset and there were no null values this made the process easier. since the the topic is about conversation and deals with textual data i retrivied the counts of each word by counting the number of words. after examining this data i identified there were many unrealted data such as "to", "the" etc. before moving towards the stopword removal data i implemented the tokenizing and stemming process. because some of the stopwards may end up giving meaning to the actual conversation. therefore, i performed proter stemmer then implemented stopwords removals. this enabled in providing better accuraccy when using Term frequency inverse document frequency(TF-IDF). The TF-IDF was enough for visualisation process. but implementing LDA helped addressing the shortcomings of TF-IDF because LDA uses probabilistic model which helped in estimating the probability distributions for topics words and documents. lastly, the wordcloud conist of some words like "new"."plan","Australia" etc. this shows that the top conversation over the last decade were based on the topics dayled in the wordcloud. To understand the top conversation were the last decade and defines the national conversation of australia. there two such clusters in the LDA model which gives the overall conversation summary.

FINAL INSIGHT

The Top news topics are provided in the LDA model when examining the cluster of data and wordcloud. if we select the topic 4 we can understand the conversation top most relevant convesation is related to "australian bushfire" and "austrilian elections" if we compare it with the other relevant topics surrounding topic which are clustered together, we can see that they consist some of the conversation which are similar to all the topics. one such conversation is realted to "scientist" and "politician" which is present in all the topics. Through this LDA model the stakeholders such as news agency, newspaper organisations can understand the area in which they covered the news over the last decade and understand its importance.

In the LDA model there is another cluster of topics, we can see in the most relvant topic terms are "NSW", "china" and "kill". same as the above the similar topics here which are "health" and "doctor". the combination of the clusters of data we can conclude that top conversation over the last decade is related to some of the topics mentioned above. this analysis will help the stakeholders such as Australian newspaper organisation or Australian Press Council to understand topic that they covered over the last decade and will help them identify the converstation and what it says about australia.

In []: