| | Lab 2: Text Data Visualization Objectives: To gain more practice in exploring and pre-processing text data. To create visualization for the textual data using the techniques introduced in class. |
|-------------------------------------|--|
| In [1]: In [2]: | # from google.colab import drive # drive.mount('/content/drive') Download the data (UN General Debate) # !wget https://github.com/blueprints-for-text-analytics-python/blueprints-text/raw/193c79c7d94973f2398e67da8d20bf7a535f7f40/data/un-general-debates/un-general-debates-blueprint.cs Read the data |
| In [3]: | <pre>import pandas as pd df = pd.read_csv('un-general-debates-blueprint.csv.gz', compression='gzip') df C:\Users\ASUS\AppData\Roaming\Python\Python310\site-packages\pandas\core\arrays\masked.py:60: UserWarning: Pandas requires version '1.3.6' or newer of 'bottleneck' (version '1.3.5' currently installed). from pandas.core import (C:\Users\ASUS\AppData\Local\Temp\ipykernel_14180\629987728.py:1: DeprecationWarning: Pyarrow will become a required dependency of pandas in the next major release of pandas (pandas 3.0), (to allow more performant data types, such as the Arrow string type, and better interoperability with other libraries)</pre> |
| Out[3]: | but was not found to be installed on your system. If this would cause problems for you, please provide us feedback at https://github.com/pandas-dev/pandas/issues/54466 import pandas as pd session year country country_name speaker position text 0 25 1970 ALB Albania Mr. NAS NaN 33: May I first convey to our President the co 1 25 1970 ARG Argentina Mr. DE PABLO PARDO NaN 177.\t: It is a fortunate coincidence that pr 2 25 1970 AUS Australia Mr. McMAHON NaN 100.\t It is a pleasure for me to extend to y |
| | 3 25 1970 AUT Austria Mr. KIRCHSCHLAEGER NaN 155.\t May I begin by expressing to Ambassado 4 25 1970 BEL Belgium Mr. HARMEL NaN 176. No doubt each of us, before coming up to 7502 70 2015 YEM Yemen Mr. Abdrabuh Mansour Hadi Mansour President On behalf of the people and the Government of 7503 70 2015 YUG Yugoslavia Mr. Tomislav Nikolić President I should like to congratulate the President an 7504 70 2015 ZAF South Africa Jacob Zuma President I would like to begin by thanking the Secretar |
| | 7506 70 2015 ZWE Zimbabwe Robert Mugabe President Allow me at the outset to extend to Mr. Mogens 7507 rows × 7 columns EDA - Explore more about this dataset Add new column which presents length of the text |
| In [4]: In [5]: Out[5]: | |
| | 3 25 1970 AUT Austria Mr. KIRCHSCHLAEGER NaN 155.\t May I begin by expressing to Ambassado 26616 4 25 1970 BEL Belgium Mr. HARMEL NaN 176. No doubt each of us, before coming up to 25911 |
| In [6]: | 7506 70 2015 ZWE Zimbabwe Robert Mugabe President Allow me at the outset to extend to Mr. Mogens 11013 7507 rows × 8 columns List all columns in this dataset df.columns Index(['session', 'year', 'country', 'country_name', 'speaker', 'position', |
| In [7]: | 'text', 'length'], dtype='object') Types of data for each column df.dtypes session int64 year int64 country object country_name object country_name object |
| In [8]: | speaker object position object text object length int64 dtype: object All information df.info() <class 'pandas.core.frame.dataframe'=""> RangeIndex: 7507 entries, 0 to 7506</class> |
| | Data columns (total 8 columns): # Column Non-Null Count Dtype |
| In [9]: Out[9]: | dtypes: int64(3), object(5) memory usage: 469.3+ KB For all integer-typed columns, find out their stats df.describe().T count mean std min 25% 50% 75% max session 7507.0 49.610763 12.892155 25.0 39.0 51.0 61.0 70.0 |
| In [10]: Out[10]: | year 7507.0 1994.610763 12.892155 1970.0 1984.0 1996.0 2006.0 2015.0 length 7507.0 17967.281604 7860.038463 2362.0 12077.0 16424.0 22479.5 72041.0 Investigate: Any missing data? # Missing data df.isna().sum() session 0 year 0 |
| | country 0 country_name 0 speaker 27 position 3005 text 0 length 0 dtype: int64 Address the missing data in the column "speaker" by replacing those missing values with 'unknown'. |
| In [11]: | df.isna().sum() C:\Users\ASUS\AppData\Local\Temp\ipykernel_14180\3617655558.py:1: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series through chained assignment using an inplace method. The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we are setting values always behaves as a copy. For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col] = df[col].method(value) instead, to perform the operation inplace on the original object. df['speaker'].fillna('unknown',inplace=True) |
| Out[11]: | session 0 year 0 country 0 country_name 0 speaker 0 position 3005 text 0 length 0 dtype: int64 Find out all unique speakers in this dataset. |
| In [12]: Out[12]: In [13]: Out[13]: | pd.unique(df['speaker']) array(['Mr. NAS', 'Mr. DE PABLO PARDO', 'Mr. McMAHON',, |
| In [14]: | Filter only records of which the speaker is President 'Bush'. df[df['speaker'].str.contains('Bush')] session year country country_name speaker position text length 2720 44 1989 USA United States Bush President I am honoured to address the General Assembly 19779 3038 46 1991 USA United States George Bush President I am honoured to speak with you as you open t 15555 4814 56 2001 USA United States George W. Bush President We meet in a Hall devoted to\npeace; in a cit 14724 |
| | 5002 57 2002 USA United States Mr. George W. Bush President We meet one year and one day\nafter a terrori 16684 5191 58 2003 USA United States George W. Bush President Twenty-four months ago, and\nyesterday in the 16962 5382 59 2004 USA United States Mr. George W Bush President Thank you for the honour of\naddressing the Ge 18628 5760 61 2006 USA United States Mr. George W. Bush President I am grateful for the privilege of \nspeaking 16675 5951 62 2007 USA United States George W. Bush President Thank you for the opportunity \nto address the 15483 6143 63 2008 USA United States George W. Bush President I am pleased to be here to \naddress the Gener 18384 |
| In [15]: Out[15]: | array(['\ufeffWe meet in a Hall devoted to\npeace; in a city scarred by violence; in a nation\nawakened to danger; in a world uniting for a long\nstruggle. Every civilized nation lere today is resolved\nto keep the most basic commitment of civilization. We\nwill defend ourselves and our future against terror and\nlawless violence.\nThe United Nations was for nded in this cause. In\nthe Second World War, we learned that there is no\nisolation from evil. We affirmed that some crimes are\nso terrible they offend humanity itself, and we re solved\nthat the aggressions and ambitions of the wicked must\nbe opposed early, decisively and collectively, before\nthey threaten us all.\nThat evil has returned, and that cause is renewed.\nA few miles from here, many thousands still lie in a\ntomb of rubble. Tomorrow, the Secretary-General, the\nPresident of the General Assembly and I will visit that\ns: te, where the names of every nation and region that\nlost citizens will be read aloud. If we were to read out\nthe names of every person who died, it would take\nmore than three here |
| | urs.\nThose names include a citizen of the Gambia,\nwhose wife spent their fourth wedding anniversary, 12\nSeptember, searching in vain for her husband. Those\nnames include a man who supported his wife in\nMexico, sending home money every week. Those\nnames include a young Pakistani who prayed towards\nMecca five times a day and who died that day trying to \nsave others.\nThe suffering of 11 September was inflicted on\npeople of many faiths and many nations. All of the\nvictims, including Muslims, were killed with equal\nindifference and equal satisfaction by the terrorists\nleaders.\nThe terrorists are violating the tenets of every\nreligion, including the one they invoke. Last week, the\nsneikh of Al-Azhar Unversity, the world's oldest\nIslamic institution of higher learning, declared that\nterrorism is a disease and that Islam prohibits killing\ninnocent civilians. The terrorists call their cause holy,\nyet they fund it with drug dealing. They encourage\nmurder and suicide in the name of a great faith that\nforbids both. They dare to ask God's blessing as they\set out to kill innocent men, women and children. But\n8\n\nthe God of Isaac and Ishmael would never answer such\na prayer. And a murderer is not a martyr; he is just a\nmurdere r.\nTime is passing. Yet for the United States of\nAmerica, there will be no forgetting 11 September. We\nwill remember every rescuer who died in honour. We\nwill remember every for mily that lives in grief. We will\nremember the fire and ash, the last phone calls, the\nfunerals of the children.\nAnd the people of my country will remember\nthose who have plot ed against us. We are learning\ntheir names. We are coming to know their faces. There\nis no corner of the Earth distant or dark enough to\nprotect them. However long it takes, the ir hour of\njustice will come.\nEvery nation has a stake in this cause. As we\nmeet, the terrorists are planning more murder -\nperhaps in my country, or perhaps, fellow members, in hour of\njustice will come.\nEvery nation has a stake in this |
| | n\nyours. They kill because they aspire to dominate. They\nseek to overthrow Governments and to destabilize\nentire regions. Last week, anticipating this meeting of\nthe General Asembly, they denounced the United\nNations; they called our Secretary-General a criminal\nand they condemned all Arab nations here as traitors to\nIslam. Few countries meet their exacting standards of\nbrutality and oppression. Every other country is a\npotential target.\nAnd all the world faces the most horrifying\nprospect of all: those same terrorists are searching for\nweapons of mass destruction, the tools to turn their\nhatred into holocaust. They can be expected to use\nchemical, biological and nuclear weapons the moment\nthey are capable of doing so. No hint of conscience\nwould prevent it. That threat cannot be ignored; that\nthreat cannot be appeased. Civilization itself — the\ncivilization we share — is threatened. History will\nrecord our response and will judge or justify every\nnation in this Hall.\nThe civilized world is now responding. We act to\ndefend ourselves and to diver our children from a\nfuture of fear. We choose the dignity of life over a\nculture of death. We choose lawful change and civil\ndisagreement over coercion, subversion and change commitments — hope and order, law and life —\nunite people across cultures and continents. Upon those\ncommitments depend all peace and progress. For those\ncommitments we are determined to fight.\nThe United Nations has risen to this\nresponsibility: on 12 September, these buildings\nopened for emergency meetings of the General\named to he world stood condemned by\nthe world, and I want to thank you, fellow members,\nfor that strong and principled stand.\nI also thank the Arab and Islamic countries that\nhave condemned terrorist murder. Many of you have\nseen the destruction of terror in your own lands. The\nterrorists are included as a place of the control of terror in your own lands. The\nrecord or the single is a place of the control of terror in your own lands. The\nre |
| | faith.\nThe conspiracies of terror are being answered by\nan expanding global coalition. Not every nation will be\npart of every action against the enemy. But every\nnation in our coalition has duties. Those duties can be\ndemanding, as we in America are learning. We have\nalready made adjustments in our laws and in our daily\nlives. We are taking new measures to investigate terror\nand to protect against threats.\nThe leaders of all nations must now carefully\nconsider their responsibilities and their future. Terrorist\ngroups such as Al Qaeda depend upon the aid or\nindifference of Governments. They need the support of\na financial infrastructure and safe havens to train and\nplan and hide.\nSome nations want to play their part in the fight\nagainst terror but tell us they lack the means to enforce\ntheir laws and control their borders. We stand ready to\nhelp.\nSome Governments still urn a blind eye to the\nterrorists, hoping the threat will pass them by. They are\nmistaken.\nAnd some Governments, while pledging to\nuphold the principles of the United Nations, have cast\ntheir lot with the terrorists. They support them and\nharbour them. And they will find that their welcomed\nguests are parasites that will weaken them and\neventually or nsume them. For every regime that\nsponsors terror there is a price to be paid, and it will be\npaid. The allies of terror are equally guilty of murdery nand equally accountable to justice.\nThe Taliban are now learning that lesson. That\nregime and the terrorists who support it are now\nvirtually indistinguishable. Together they promote\n9\n\nterror abroad and impose a reign of terror on the\nAfghan people. Women are executed in Kabul's soccer\nstadium. They can be beaten for wearing socks that are\ntoo thin. Men are jailed for missing prayer meetings.\nThe United States, supported by many nations, is\nbringing justice to the terrorists in Afghanistan. We are\nmaking progress against military targets — and that |
| | is\nour objective. Unlike the enemy, we seek to minimize,\nnot maximize, the loss of innocent life. I am proud of\nthe honourable conduct of the American military. And\nmy country grieves for all the suffering the Taliban\nhave brought upon Afghanistan, including the terrible\nburden of war.\nThe Afghan people do not deserve their present\nrulers. Years of aliban misrule have brought nothing\nbut misery and starvation. Even before this current\ncrisis, 4 million Afghans depended on food from the\nUnited States and other nations, and millions of\nAfghans were refugees from Taliban oppression.\nI make this promise to all the victims of that\nregime: the Taliban's days of harbouring terrorists, and\ndealing in he roin, and brutalizing women are drawing\nto a close. When that regime is gone, the people of\nAfghanistan will say, with the rest of the world, good\nriddance.\nI can promise, too, that America will join the\nworld in helping the people of Afghanistan rebuild\ntheir country.\nMany nations, including mine, are sending food\nand medicine to help Afghans through the winter.\nAmerica has airdropped over 1.3 million packages of\nrations in Afghanistan. Just this week, we airlifted\n20,000 blankets and over 200 tons of provisions into\nthe region. We continue to provide humanitarian aid,\neven while the Taliban try to steal the food we send.\nMore help, eventually, will be needed. The\nUnited States will work closely with the United\nNations and development banks to reconstruct\nAfghanistan after hostilities there have ceased and the\nTaliban are no longer in control. And the United States\nwlimity work with the United Nations to support a post-\nTaliban Government that represents all of the Afghan\npeople.\nTn this war of terror, each of us must answer for\nwhat we have done or what we have left undone. After\ntragedy, there is a time for sympathy and condolence.\nMy country has been very grateful for both.\nThe memorials and vigils around the world we have |
| | Il\nnot be forgotten. But the time for sympathy has now\npassed. The time for action has now arrived.\nThe most basic obligations in this new conflict\nhave already been defined by the United Nations. On\n28 September, the Security Council adopted resolution\n1373 (2001). Its requirements are clear: every\nUnited Nations Member has a responsibility to crack\ndown on terrorist financing. We must pass all necessary\nlaws in our own countries to allow the confiscation of\nterrorist assets. We must apply those laws to every\nfinancial insitution in every nation.\nWe have a responsibility to share intelligence and\ncoordinate the efforts of law enforcement. If you know\nsomething, tell us. If we know something, we will tell\nyou. And when we find the terrorists, we must work\ntogether to bring them to justice.\nWe have a responsibility to deny any sanctuary,\nsafe haven, or transit to terrorists. Every known\nterrorist camp must be shut down, its operators\napprehended, and evidence of their arrest presented to\nthe United Nations.\nWe have a responsibility to deny we pons to\nterrorists – and to actively prevent private citizens\nfrom providing them.\nThese obligations are urgent, and they are binding\non every nation with a place in this Hall Many\nGovernments are taking these obligations seriously,\nand my country appreciates it. Yet even beyond\nresolution 1373 (2001), more is required – and more\nin expected – of ou coalition against terror. We are\nasking for a comprehensive commitment to this fight.\nWe must unite in opposing all terrorists, not just\nsome of them. In this world, there even how the deliberate murder of the innocent. Any\nGovernment that rejects this principle – trying to pick\nand choose its terrorist friends – will know the\nconsequences.\nWe have a responsibility to define the most defined to account the world. |
| | ust speak the truth about terror. Let us never\ntolerate outrageous conspiracy theories concerning the\nattacks of 11 September — malicious lies that attempt\nto shift the blame a ay from the terrorists themselves, haway from the guilty. To inflame ethnic hatred is to\nadvance the cause of terror.\n10\n\nThe war against terror must not serve as an\nexcuse to persecute ethnic and religious minorities in\nany country. Innocent people must be allowed to live\ntheir own lives, by their own customs, under their own\nreligion. And every nation on must have avenues for the\npeaceful expression of opinion and dissent. When these\navenues are closed, the temptation to speak through\nviolence grows.\nWe must press on with our agenda for peace and\nprosperity in every land. My country is pledged to\nencouraging development and expanding trade. My\ncountry is pledged to investing in education and\ncombot ting AIDS and other infectious diseases around\nthe world. Following 11 September, these pledges are\neven more important. In our struggle against hateful\ngroups that exploit poverty and despair, we must offer\nan alternative of opportunity and hope.\nThe American Government also stands by its\ncommitment to a just peace in the Middle East. We are\nworking towards a day when two States — Israel and\nPalestine — live peacefully together, within secure and\nrecognized borders, as called for by the Security\nCouncil resolutions. We will do all in our power to\nbring both parties back into negotiations. But peace\nwill come only when all have sworn off — forever —\nincitement, violence and terror.\nFinally, this struggle is a defining moment for the\nUnited Nations itself — and the world's most persistent violators of human rights.\nThe United Nations depends, above all, on its moral\nauthority |
| | - and that authority must be preserved.\nThe steps I have described will not be easy. For\nall nations, they will require effort. For some nations,\nthey will require great courag e. Yet the cost of inaction\nis far greater. The only alternative to victory is a\nnightmare world where every city is a potential killing\nfield.\nAs I told the American people, reedom and fear\nare at war. We face enemies that hate not our policies,\nbut our existence - the tolerance of openness and the\ncreative culture that define us. But the outcome of this\nconflict is certain.\nThere is a current in history, and it runs towards\nfreedom. Our enemies resent it and dismiss it, but the\ndreams of mankind are defined by liberty - he natural\nright to create, and build, and worship, and live in\ndignity. When men and women are released from\noppression and isolation, they find fulfilment and hope,\nand they leave poverty by the millions. These\naspirations are lifting up the peoples of Europe, Asia,\nAfrica and the Americas, and they can lift up all of the\nIslamic world. We stand for the permanent hopes of\nhumanity, and those hopes will not be denied.\nWe are confident, too, that history has an author,\nwho fills time and eternity with his purpose. We know\ntl at evil is real, but good will prevail against it. This is\nthe teaching of many faiths. And in that assurance, we\ngain strength for a long journey.\nIt is our task - the task of this generation - to\nprovide the response to aggression and terror. We have\nno other choice, because there is no other peace. We\ndid not ask for this mission, yet there is honor in\nhistory's call. We have a chance to write the story of\nour times - a story of courage defeating cruelty, and\nlight overcoming darkness. This calling is worthy of\nany life and worthy of every nation. So let us go\nforward - confident, determined and unafraid.\nn\n\n\n\n\n , |
| | Tasks Select 3 speeches from different people and perform the following: Pre-process each speech using techniques taught in class Find top 10 words Select proper text visualization technique (at least 2 techniques) to gain more insights about the speech |
| In [16]: Out[16]: | selected_speeches session year country country_name speaker position text length 7495 70 2015 USA United States Barack Obama President Seventy years after the founding of the United 28300 6336 64 2009 USA United States Barack Obama President It is my honour to address the \nAssembly for 30245 |
| In [17]: | import nltk from nltk.tokenize import word_tokenize from nltk.corpus import stopwords from nltk.stem import WordNetLemmatizer import string # nltk.download('punkt') # nltk.download('stopwords') # nltk.download('wordnet') |
| | <pre># Define a function for pre-processing def preprocess(text): # Tokenize tokens = word_tokenize(text) # Remove punctuation tokens = [token for token in tokens if token not in string.punctuation] # Lemmatize lemmatizer = WordNetLemmatizer()</pre> |
| In [18]: | <pre>lemmatized_tokens = [lemmatizer.lemmatize(word) for word in tokens] # Remove stopwords stop_words = set(stopwords.words('english')) filtered_tokens = [word.lower() for word in lemmatized_tokens if word.isalpha() and word.lower() not in stop_words] return filtered_tokens # Apply pre-processing to each speech selected_speeches['processed_text'] = selected_speeches['text'].apply(preprocess)</pre> |
| | <pre># Find top 10 words top_words = [word for sublist in selected_speeches['processed_text'] for word in sublist] top_10_words = nltk.FreqDist(top_words).most_common(10) # Display top 10 words print("Top 10 Words:") for word, count in top_10_words: print(f"{word}: {count}")</pre> Top 10 Words: nation: 110 |
| | people: 95 world: 80 united: 64 must: 53 u: 44 states: 43 ha: 42 peace: 41 human: 39 Note 'u' = 'us' and 'ha' = 'has' |
| In [19]: | <pre>import matplotlib.pyplot as plt from wordcloud import Wordcloud # Iterate through each row (speech) for index, row in selected_speeches.iterrows(): # Generate word cloud for the current speech wordcloud = WordCloud(width=800, height=400, background_color='white').generate(' '.join(row['processed_text'])) # Display the generated word cloud using matplotlib plt.figure(figsize=(10, 5))</pre> |
| | plt.imshow(wordcloud, interpolation='bilinear') plt.title(f"word Cloud for Speech {row['year']} - {row['speaker']}") plt.axis('off') plt.show() Word Cloud for Speech 2015 - Barack Obama Word Cloud for Speech 2015 - Barack Obama **Trather Progress** Opportunity One pursue formula institution institution working united anations opportunity one pursue formula institution in |
| | make dissipate stronger poverty MUS grant whold solve solve stronger poverty future opposition want in the stronger poverty troop secure want in dividual international order opposition want in the stronger poverty troop secure want in dividual international order opposition want in the stronger poverty troop secure want in dividual international order opposition want in the stronger poverty troop secure was allow adversary success woman part way part way part was a success woman want in the stronger poverty troop solve and solve way part way part way feat to the stronger poverty troop solve was a success woman way part way feat to the stronger poverty troop solve way part way feat to the stronger poverty troop solve way part way feat to the stronger poverty troop solve way part way to the stronger poverty troop solve way to the stro |
| | word Cloud for Speech 2009 - Barack Obama Word Cloud for Speech 2009 - Barack Obama State |
| | means year with the place place within purpose of the purpose of |
| | help choose help progress progress progress to time hold even time hold even time hold to together treaty continue part together treaty of the progress of the |
| | Word Cloud for Speech 2004 - Mr. George W Bush Work democratic region provide welcons of providing century resolution helping sudan George W Bush Long to the provide welcons of providing century resolution helping sudan Long to the provide welcons of providing century resolution helping sudan Long to the provide welcons of providing century resolution helping sudan Long to the provide welcons of providing century resolution helping sudan Long to the provide welcons of providing century resolution helping sudan Long to the provide welcons of providing century resolution helping sudan Long to the provide welcons of providing century resolution helping sudan Long to the provide welcons of providing century resolution helping sudan Long to the provide welcons of providing century resolution helping sudan Long to the provide welcons of providing century resolution helping sudan Long to the provide welcons of providing century resolution helping sudan Long to the provide welcons of providing century resolution helping sudan Long to the provide welcons of providing century resolution helping sudan Long to the provide welcons of providing century resolution helping sudan Long to the provide welcons of providing century resolution helping sudan Long to the provide welcons of providing century resolution helping sudan Long to the provide welcons of |
| | achieve free many of struggle struggle struggle with the general assembly protection distance and the general a |
| | In all three speeches, 'nation', 'people', and 'world' are prominent themes. The 2015 Barack Obama speech emphasizes 'united', 'states', 'together', and 'us' suggesting a focus on unity. The 2009 speech highlights 'must', 'peace', and 'america' reflecting a commitment to peace and national priorities. The 2004 George W. Bush speech discusses 'terrorist', 'democracy', 'government', and 'freedom' indicating a focus on global security and democratic principles. |
| In [20]: | <pre>import seaborn as sns import nltk from sklearn.feature_extraction.text import CountVectorizer import pandas as pd import matplotlib.pyplot as plt # Find top 20 words top_20_words = [word for word, count in nltk.FreqDist(top_words).most_common(20)] # Create a CountVectorizer to convert the text into a document-term matrix vectorizer = CountVectorizer(vocabulary=top_20_words, token_pattern=r'(?u)\b\w+\b')</pre> |
| | <pre>dtm = vectorizer.fit_transform(selected_speeches['processed_text'].apply(' '.join)) # Create a DataFrame with the word counts word_counts = pd.DataFrame(dtm.toarray(), columns=top_20_words) # Set the titles of the documents as the index word_counts.index = selected_speeches['year'].astype(str) + ' - ' + selected_speeches['speaker'] # Create a centered heatmap plt.figure(figsize=(12, 8)) sns.heatmap(word_counts, cmap='viridis', annot=True, fmt='d', center=0, cbar_kws={'label': 'Word Count'})</pre> |
| | sns.heatmap(word_counts, cmap='viridis', annot=True, fmt='d', center=0, cbar_kws={'label': 'Word Count'}) plt.title('Top 20 Words - Multiple Speeches') plt.show() Top 20 Words - Multiple Speeches - 45 - 40 |
| | - 35 To the second of the seco |
| | Hongo Variable 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |
| | 8 |
| In []: | From the visualization, it seem like the top 4 words are commonly found in the speeches. Notably, Barack Obama's 2009 address stands out for its frequent use of 'must', 'peace', and 'america', suggesting a focus on imperative actions and national harmony. George W. Bush's 2004 speech emphasizes the term 'human' more than others, hinting at a potential emphasis on humanity-related topics. In contrast, Barack Obama's 2015 speech seems to emphasize unity by combining 'united' and 'states' hinting at a thematic emphasis on national cohesion during that period. |
| []: | |