**Overview:** This presentation introduces the major voting General Assembly topics and their voting patterns for the past 27 years (1980-2017), including the period of the Cold War.

**Data:** 3348 General Assembly resolutions and corresponding voting records from the period 1980-2017 were obtained from the United Nations Digital Library (<https://digitallibrary.un.org/search?ln=en&cc=Voting+Data>) and UN.org (<http://www.un.org/en/sections/documents/general-assembly-resolutions/index.html>).

**Methodology:** After a careful analysis, the resolutions were categorized into 68 major topics (e.g., Nuclear Disarmament, Peace in Middle East, Decolonization, Universal Human Rights, South Africa, etc.). Specifically, the resolutions were grouped into a variety of either thematic or country-specific issues. For example, a resolution about human rights in a particular country would be categorized as an issue pertaining to this particular country while a resolution about human rights in the world in general or on specific continents would be categorized as a thematic issue such as Universal Human Rights. Although General Assembly member nations might disagree on a specific wording of resolutions, they are drafted in the way that promote a peaceful resolution of all disputes, that is they support the resolutions towards international peace, cooperation, security, the protection of human rights, and international collaboration on economic, political, social, cultural, educational, environmental issues and health. In addition, some of the resolutions discuss and approve the UN budget and funding. The disagreement between GA member nations may arise, for example, when a resolution contains more or less urgent connotation. For instance, "Calls upon" has a stronger emotional connotation than "Requests" and "Urges" is viewed to have even stronger emotion. In the early days of the UN all draft resolutions were put to a vote, now every draft resolution is discussed beforehand in informal consultations where some of the language is sacrificed in a spirit of compromise.   
  
The key to successful drafting of both oral proposals and/or draft resolutions is to consult widely so as to know the concerns of others before putting pen to paper, and then to factor these into drafts so as to recruit sponsors and disarm opponents. When a draft resolution is written by one delegate, it should be again consulted widely and be ready to modify it in response to the concerns of other delegations. This process will often ensure the draft’s acceptance when it is put to the committee for decision. At the very least, any points of serious disagreement will have been identified and isolated.

193 UN Member States are represented in the General Assembly. Each Member State has one vote. Decisions on such key issues as international peace and security, admitting new members and the UN budget are decided by a two-thirds majority. Other matters are decided by simple majority. Many decisions are reached by consensus without a formal vote.

The voting patterns of the GA member nations were clustered using machine learning techniques. Prior to clustering the votes were recoded to mathematically conceptualize them, followed by a data imputation (the process of replacing missing data with substituted values). The missing data was at random. Some GA member nations were simply absent during the voting or new nations would cease/appear due to major global political changes for the period of 1980-2017 (e.g., a reorganization of a few countries of the Soviet Block after the collapse of the Soviet Union).

The numerical representation of votes was averaged across the resolutions. This strategy helped us to reduce the data dimensionality and the fraction of missing data. Furthermore, to reduce the fraction of missing data more and an uncertainty that come with data imputation, the countries that voted on 400 resolutions or less were excluded from the sample, leaving total of 175 countries for clustering with only 13% of missing data. The iexcluded countries were Bosnia & Herzegovina, Czech Republic, Democratic Kampuchea, Eritrea, Kiribati, Kyrgyzstan, Laos, Moldova, Montenegro, Nauru, Palau, Serbia, Serbia & Montenegro, South Sudan, Timor-Leste, Tuvalu, Upper Volta.

Two types of imputation techniques were performed to ensure the robust results: 1) mean imputation 2) median imputation. The imputations produced slightly different results. Georgia and Ukraine appeared in the Eastern Block cluster instead of the Western Block cluster. These variations had no impact on the findings overall. After imputing the data, PCA (Principle Component Analysis) was conducted to further reduce high dimensionality of the data, producing 20 major principle components that cumulatively explained 80.88% of the variance for voting patterns. PC1 explained 28.41% of all voting patterns while PC1 and PC2 together explained 31.15% of all voting patterns. Several hierarchical clustering analyses with a various number of clusters on were conducted. Five clusters were chosen. The graph representing the five major voting camps is the final hierarchical analysis plotted in principle component space of PC1 vs. PC2. Finally, we averaged the votes across the clusters and presented the results on the heatmap.

Similar procedure was conducted to investigate a voting pattern across the years. We were interested in whether the voting pattern across nations changed after collapse of the Soviet Union on the major ongoing topics (aka, categories). Specifically, we divided the data into two groups: 1) data from 1980 through 1990, and 2) data from 1991 through 2017. Again, we repeated the same process above for each data sample. After imputing the data, PCA (Principle Component Analysis) was conducted to reduce high dimensionality of the data, producing 25 major principle components that cumulatively explained 85.88% of the variance for voting patterns for the first sample and 30 major principle components for the second sample, respectively. PC1 explained 16.41% of all voting patterns while PC1 and PC2 together explained 38.15% for the first data sample and PC1 explained 10.41% of all voting patterns while PC1 and PC2 together explained 43.15% for the second sample. Then, we conducted several hierarchical clustering analyses with a various number of clusters. Two and three clusters were chosen, respectively. The graphs representing the voting patern from 1980 through1990 and from 1991 through 2017 are plotted in principle component space of PC1 vs. PC2. Finally, votes across the clusters were averaged and presented the results on the bar chart.