Religion in International Relations: An Exploratory Data Analysis Project

Panagiotis Podiotis, Undergraduate Student, University of Macedonia, Department of International and European Studies, Thessaloniki – Greece
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5. Clustering

K-Means clustering, optimal number of clusters determined with elbow method, religious composition of each country used as feature.
*Unsupervised Mean-Shift was also implemented but resulted in only 4 clusters consisting of: mostly Christian states, mostly Muslim states, Armenia and Israel. The K-Means approach was preferred because it uncovers more information.

Group	Countries	Characteristics/Comments
1. (30)	Antigua And Barbuda, Angola, Barbados, Bahamas, Solomon Islands, Cameroon, El Salvador, Fiji, Micronesia, Grenada, Guatemala, Guyana, Honduras, Jamaica, Lesotho, Vanuatu, Nauru, Papua New Guinea, Palau, Marshall Islands, Rwanda, Saint Kitts And Nevis, Tonga, Tuvalu, Uganda, United States, Saint Vincent And The Grenadines, Samoa, Zambia, Zimbabwe	-Top Common Religion (avg. %): Protestant (56) -Atheism/Unaffiliated (avg. %): 10 -Variety of Religions (avg. %): 6 Weakest dominant religion and high multi-religiosity.
2. (51)	United Arab Emirates, Afghanistan, Algeria, Azerbaijan, Albania, Bahrain, Bangladesh, Bosnia And Herzegovina, Brunei, Chad, Comoros, Djibouti, Egypt, Gambia, The, Guinea, Gaza Strip, Indonesia, Iran, Iraq, Jordan, Kyrgyzstan, Kuwait, Kosovo, Kazakhstan, Lebanon, Libya, Mali, Morocco, Mauritania, Oman, Maldives, Malaysia, Niger, Nigeria, Pakistan, Guinea-Bissau, Qatar, Saudi Arabia, Senegal, Sierra Leone, Somalia, Sudan, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, Burkina Faso, Uzbekistan, West Bank, Yemen	- Top Common Religion (avg. %): Islam (85) -Atheism/Unaffiliated (avg. %): 3 -Variety of Religions (avg. %): 4 Lebanon, despite its big Christian community was classified into the Islam-predominant country group. The components of this group have the lowest religious diversity and strongest dominant religion.
3. (32)	Armenia, Australia, Belgium, Belize, Benin, Canada, Congo, China, Central African Republic, Denmark, Estonia, Czechia, Finland, Gabon, Germany, Hungary, India, Israel, Cote D'ivoire, Korea, South, Latvia, Mauritius, Mozambique, Netherlands, Nepal, Suriname, Russia, Switzerland, Trinidad And Tobago, Togo, Uruguay, Vietnam	Top Common Religion (avg. %): None (34) -Atheism/Unaffiliated (avg. %): 34 -Variety of Religions (avg. %): 6 Countries in this category are mostly without a dominant religion. In the case of China and Russia, atheism is high because of the Communist present and past respectively.
4. (42)	Andorra, Argentina, Austria, Bolivia, Brazil, Burundi, DR Congo, Chile, Colombia, Costa Rica, Cuba, Cabo Verde, Dominica, Dominican Republic, Ecuador, Ireland, Equatorial Guinea, Haiti, Croatia, Kiribati, Lithuania, Slovakia, Liechtenstein, Monaco, Malta, Mexico, Nicaragua, Paraguay, Peru, Poland, Panama, Portugal, Philippines, Seychelles, Slovenia, San Marino, Spain, Saint Lucia, Sao Tome And Principe, Timor-Leste, Venezuela, Holy See (Vatican City)	- Top Common Religion (avg. %): Catholic (76) -Atheism/Unaffiliated (avg. %): 11 -Variety of Religions (avg. %): 5 A very diverse group of countries in terms of geographical, economic and social distribution.
5. (21)	Botswana, Eritrea, France, Ghana, Iceland, Italy, Kenya, Liberia, Luxembourg, Madagascar, Malawi, Norway, New Zealand, South Sudan, South Africa, Sweden, Tanzania, United Kingdom, Ukraine, Namibia, Eswatini	-Top Common Religion (avg. %): Christian (70) -Atheism/Unaffiliated (avg. %): 19 -Variety of Religions (avg. %): 5 Citizens of these countries did not identify with a specific Christian doctrine thus data were not that accurate. The aforementioned reason probably explains the lack of similarity between the group's members.
6. (10)	Burma, Bhutan, Cambodia, Sri Lanka, Japan, Laos, Mongolia, Singapore, Thailand, Taiwan	- Top Common Religion (avg. %): Buddhism (68) -Atheism/Unaffiliated (avg. %): 14* -Variety of Religions (avg. %): 5 *With low confidence due to high standard deviation. A relatively uniform group in terms of geography of its members.
7. (11)	Belarus, Bulgaria, Cyprus, Ethiopia, Georgia, Greece, Moldova, Montenegro, Macedonia, Serbia, Romania	-Top Common Religion (avg. %): Orthodox (73) -Atheism/Unaffiliated (avg. %): 11* -Variety of Religions (avg. %): 5 *With low confidence due to high standard deviation. A concrete group with Orthodox predominant countries.

1. Relevance to the field

One of the many threads which form the fabric of IR is religion. Its exact place and role are still heavily debated (Troy, 2013) but someone should be completely naïve in order to totally disregard its existence and importance.
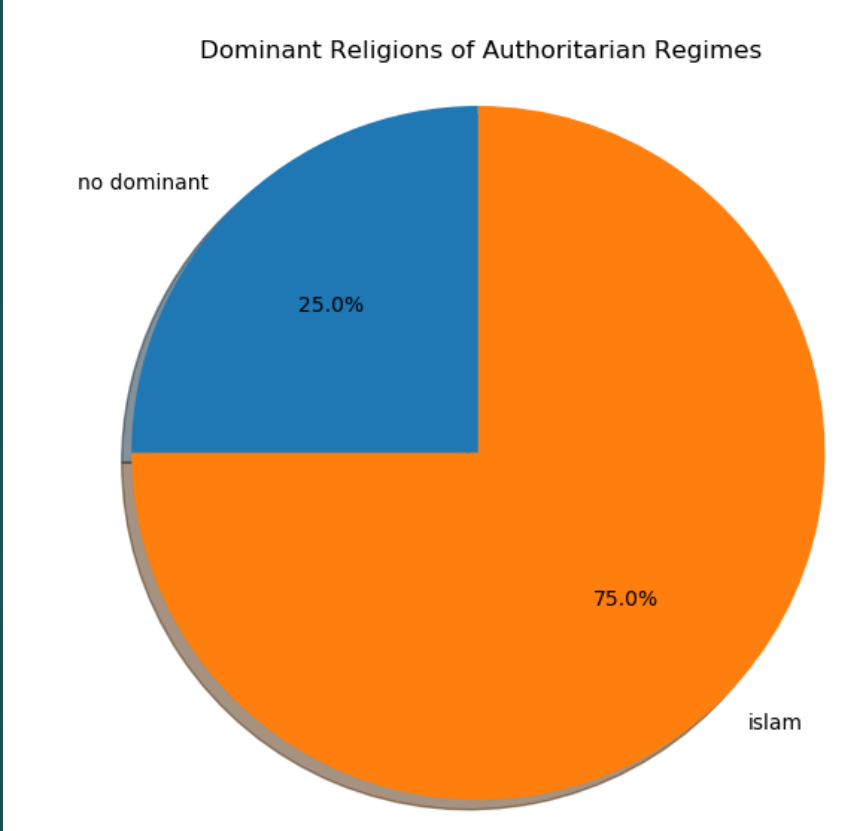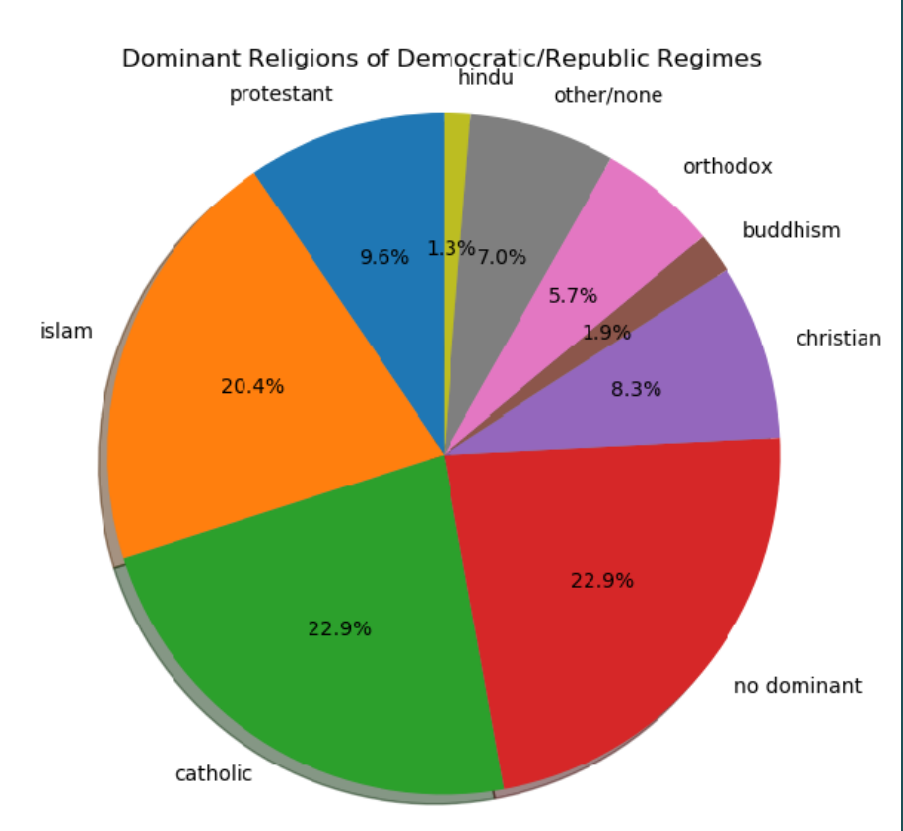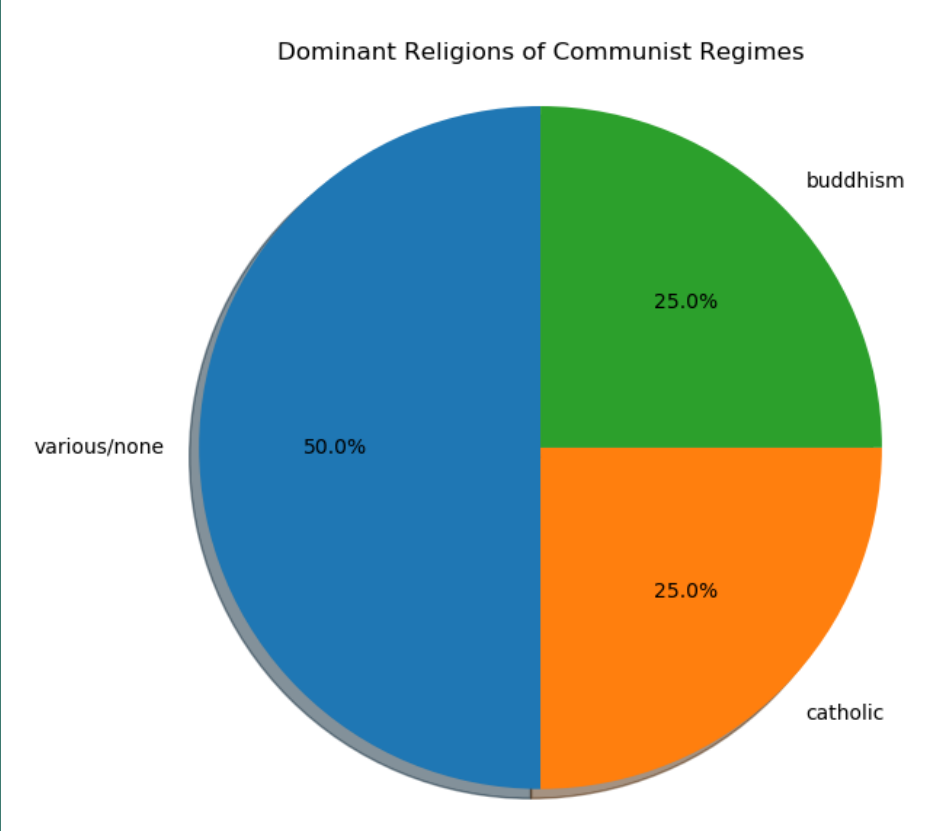
2. This Paper

This paper serves as a tool to assist and supplement the existing study of religion in IR with real-world data. It can be considered as a short yet important Data Analysis project, specifically a computational IR (Unver 2018) one. The power of python (Python Foundation 2001) programming language along with various libraries and statistical tools were used to perform two tasks: 1) Visualize religion related data. 2) Perform clustering of countries on the basis of religion.

3. The Data

Data used are drawn from the CIA World Factbook (CIA 2019, About), converted to dataset format by the author in the context of his Bachelors dissertation (Podiotis, 2020). The latest available version (2018 version, uploaded 04/01/2019 – downloaded 07/05/2020) of the CIA World Factbook which was downloaded through the official web portal was used.

4. Visualizations

Regimes were divided in Democratic, Communist, Authoritarian, Absolute and Monarchy in accordance with how they are portrayed by the CIA in the Factbook. Monarchy includes a wide array of countries which self-identify as such (from certain Gulf monarchies to various EU countries like Sweden, Denmark, UK etc.), absolute monarchies were classified under the "Absolute" category.

After studying the above graphs, the following assumptions can be made:
1. Islam is the dominant in authoritative regimes. It should be noted that authoritative regimes are labeled such by the CIA.
2. Catholicism followed by Islam dominates Democratic regimes.
3. Christianity (unspecified doctrine) is dominant in monarchies due to the European monarchies followed by Islam mostly because of Gulf States.
4. Communist states favor atheism as proven throughout history.

6. Clustering Conclusions

The most practiced religion in every country was central into the division of clusters thus each cluster represents dominant religions as well. Islamic religions seem to be the strongest dominant religions (higher average % of any other dominant religion); meaning that Islam is a stronger dominant religion than other religions. Furthermore, countries with percentages of Islam followers tend to have less religious diversity and atheism. Protestantism seems to occur in countries with the highest religious diversity.

7. References

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Code can be found at: https://github.com/Podipan/mini_projects