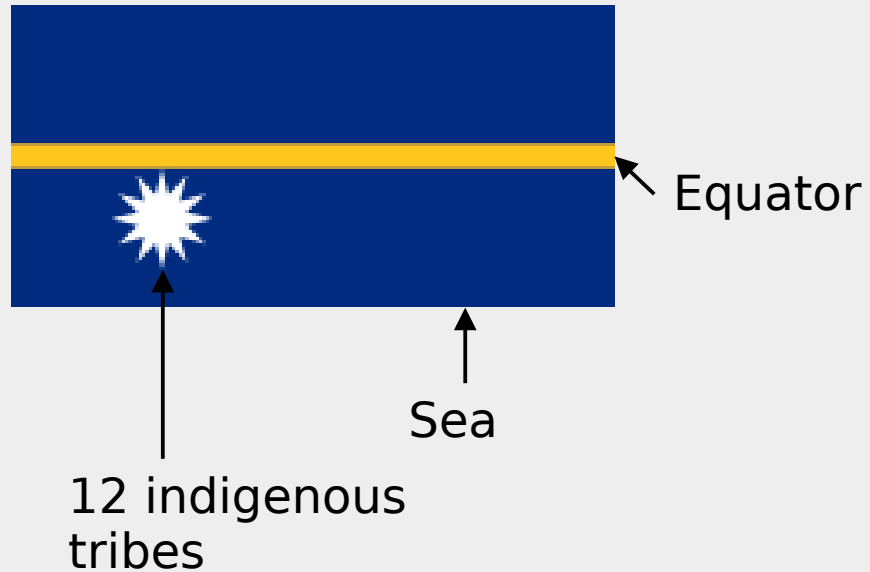


# Flag Analysis

Sofia Milton

# Flag Symbolism



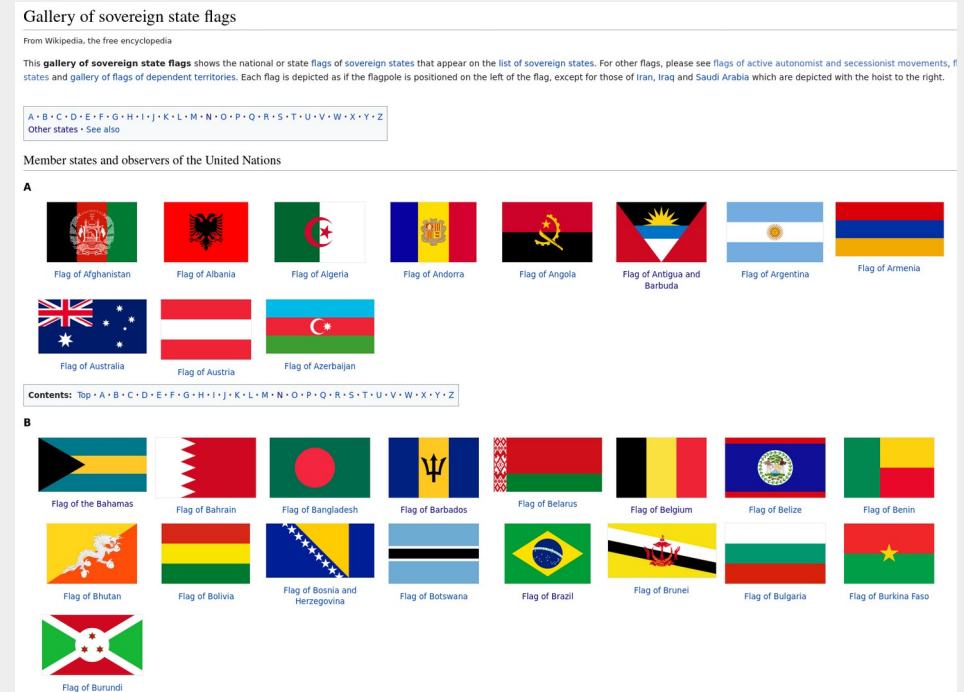
**Hypothesis:**

**Countries with shared culture and heritage use similar symbolism on their flags**

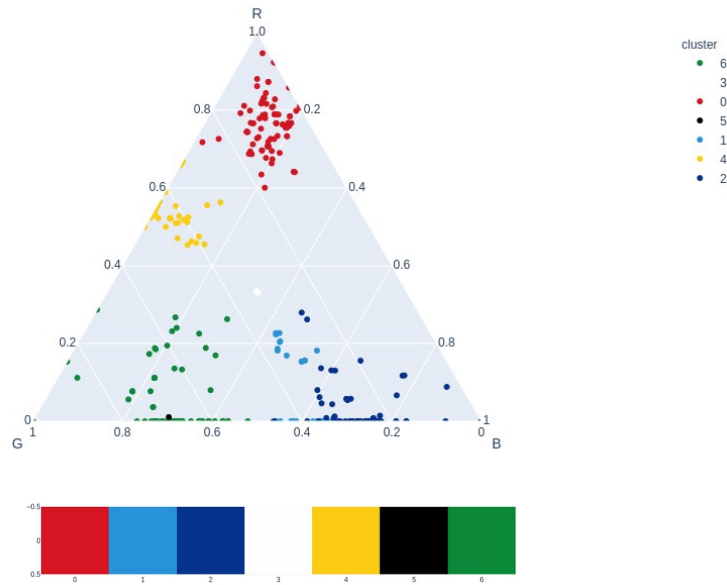
# Data Scraping

[https://en.wikipedia.org/wiki/Gallery\\_of\\_sovereign\\_state\\_flags](https://en.wikipedia.org/wiki/Gallery_of_sovereign_state_flags)

This page includes Countries with limited international recognition



# Colour Clustering



Clustering of colour spectrum into 7 shades

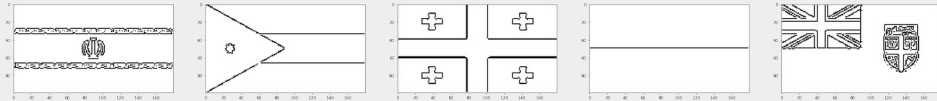
This was used to give each flag a percentage of colour used

# Colour Clustering

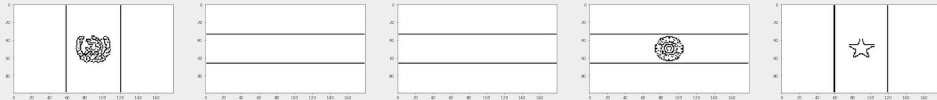


# Edge Clustering

**Clustered using PCA with VGG16**

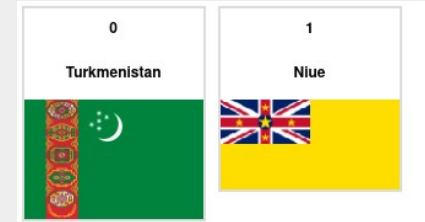
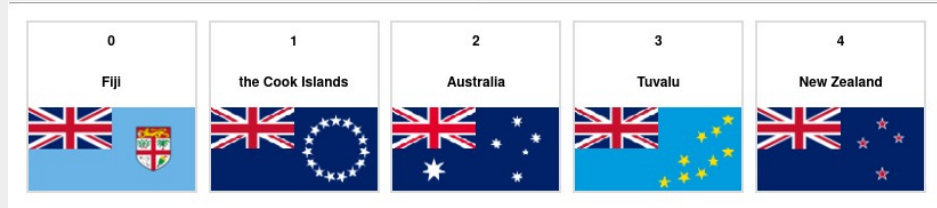


**This does result in loss of control**

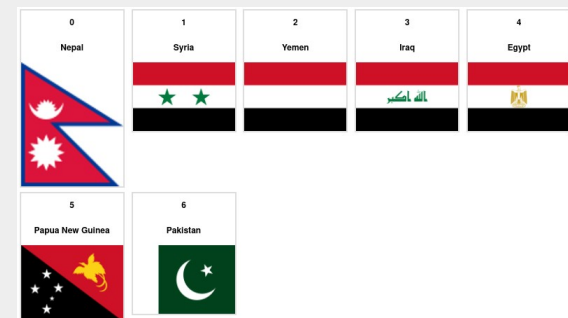
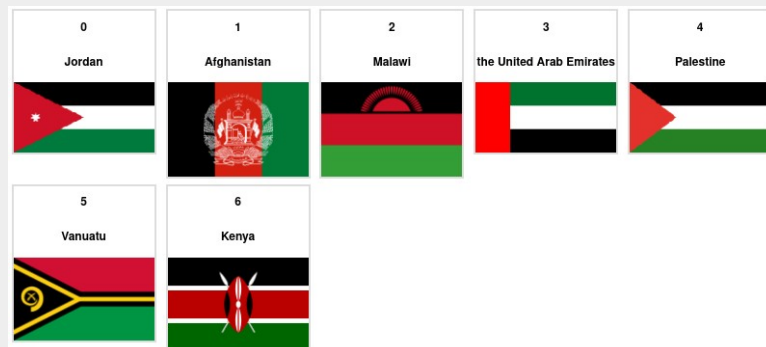


**No distinction between base shape and insignia**

# Edge Clustering



# Combination





# Problems



Determining which properties should be used to group flags requires prior knowledge of the importance of symbols

Differentiation between shared culture and isolated coincidence is hard



Chad



Romania

# Supervised

**An attempt was made to add some manual supervision by two methods:**

- **Dropping colour and shape clusters that held no value**
- **Manually adding tags to certain flags e.g. Pan-Arab colours**

**This made clusters from the tags and gave little benefit**

**Also image recognition changes clusters on each run**

# Conclusion

**Some isolated good results**

**Clusters do exist but are hard to choose**

**Image recognition lacks control**

**For an improved project:**

**Image recognition that can differentiate base flag and insignia**

**Trawl wikipedia pages for meaning behind colours/symbols**