

Functional Spec: Partisan Gerrymandering Web Application

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1. Use Types and Use Cases

One user class:

1. *User navigates to web application.*
2. *User sees an interface with a form for them to submit - does not need to login.*
3. *User uploads a recent version of a redistricting map (not implemented).*
4. *User selects compactness measure and thresholds.*
5. *Choropleth plot displays selected measure.*
6. *Table gives compactness scores for all districts.*
7. *Districts with scores exceeding the chosen threshold are highlighted in table.*

2. Requirements

a. General

- i. *CloudApps*
- ii. *Docker*
- iii. *Python*
- iv. *Node.js*
- v. *R (r-base)*
- vi. *.ejs*
- vii. *C3.js*
- viii. *OpenPGP*
- ix. *V8*

b. Geospatial Libraries

- i. *Geospatial Data Abstraction Library (GDAL)*
- ii. *Protocol Buffers (<https://developers.google.com/protocol-buffers/>)*

c. Statistical Libraries

- i. *Maptools*
- ii. *Rgdal*
- iii. *Geojsonio*
- iv. *Spatstat*
- v. *Sp*
- vi. *Geojson*
- vii. *Rgeos*
- viii. *geosphere*

3. Interfaces

a. Website

- i. The user will be able to choose compactness measures and different thresholds and in return will see how the compactness measures are distributed across different districts.

4. Data Sources

a. Shape Files

- i. .shp: The main file that stores the feature geometry.
- ii. .shx: The index file that stores the index of the feature geometry.
- iii. .dbf: The dBASE table that stores the attribute information of features
- iv. .sbx: The files that store the spatial index of the features.
- v. .prj: The file that stores the coordinate system information.