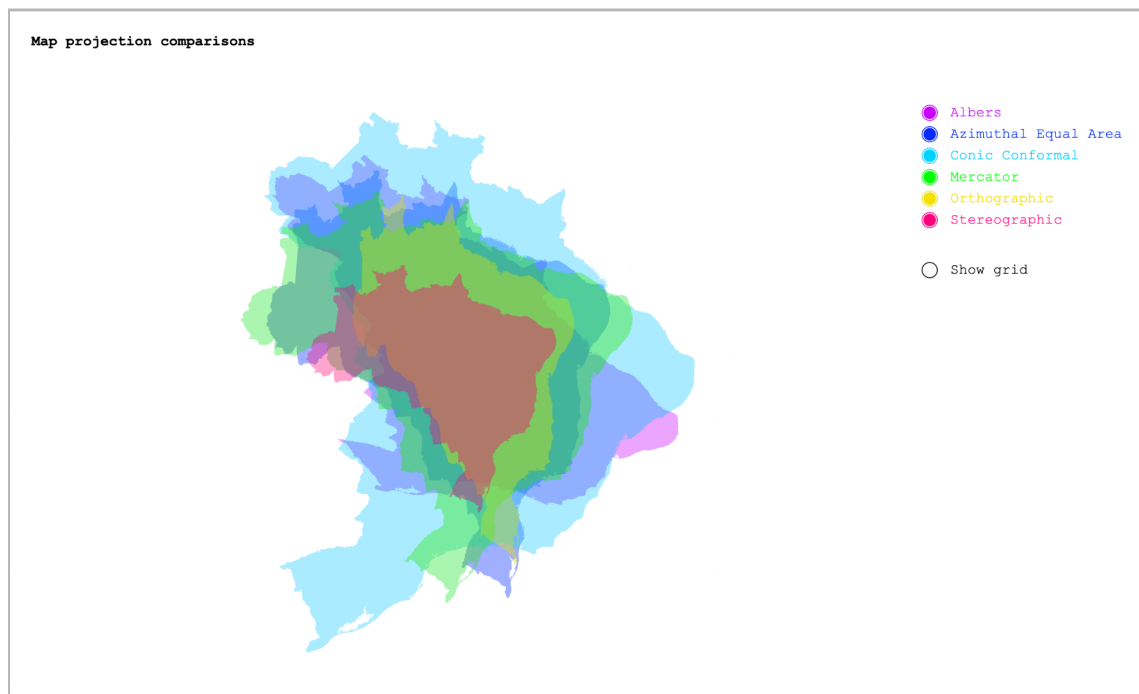616 Programming Interactive Viz
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Final project
Map projection comparisons

The project aims to create an interactive visualization able to graphically demonstrate the extent to how much and in what way a map projection can distort a geometrical shape, depending on its coordinates on a map.

Topic
The complex challenge of representing a spherical object on a two-dimensional surface leads to the existence of several distinct types of projections. Each of these projections prioritizes specific criteria, such as distance, area, and shape. The project aims to compare map projections, overlaying the same shape or country boundaries repeatedly distorted by a selected projection, allowing all of them to be observed simultaneously.

As the focus is on the projection effect over those shapes, the place shapes will be detached from their geographical location and context, allowing for a more explicit comparison. All map projections will maintain the same relative positions, and a single scale was applied. In addition, to further explore the projection distortions, the project

seeks to work not only with geographical shapes, but also to explore geometric forms and schematic grids.

What to explore
The visualization is intended to be interactive in three moments: A multi-selection toggle that turns on and off each projection, a dropdown menu to select the shape or country to be distorted, and a pan feature that allows users to drag the shape across the globe to observe the distortion in real-time, following the shape's movement.

Dataset
The dataset required for this project is essentially a geo file, such as GeoJSON, which stores the coordinate points that form the selected countries to be printed. The Data Hub repository provides a comprehensive list of countries, along with their corresponding coordinates.

Programs
The desire to work with multiple projections, combined with the draggable shape feature, leads the project to be built primarily with D3, which offers more flexibility than tools with a higher level of abstraction, such as Vega and Plot. Another source to investigate is the Google Maps platform for developers, which offers samples of JavaScript code in its API. The draggable polygons sample can be especially useful, as can the map puzzle, which demonstrates shape deformations within a game using movable countries.

Challenges and adaptations
Combining all of these features into a single graph is a complex task that may not be simple. Although the project aims to achieve these goals, intermediate steps have been planned to manage the complexity. The first step will create a single draggable shape that can be distorted in real-time. Second, it will introduce one or two more projections overlaid on the same single shape. Then, in a third instance, the project aims to introduce several additional shapes. Lastly, the target is to create a responsive interface with UI elements that can be published online, which will require careful planning and execution.