

ASSIGNMENT 05 - CARTOGRAMS

TASK:

Make a series of cartogram (value-by-area) maps showing the total population in the provinces and territories of Canada– geographic contiguous cartogram (Map 1), geographic non-contiguous cartogram (Map 2), Dorling cartogram (Map 3) and pseudo-Demers (gridded) cartogram (Map 4).

In technical report answer following questions:

1. Compare all types of cartograms and try to explain which is more illustrative to show the value of selected phenomena.

DATA SOURCES:

- polygon layer of provinces and territories (*Canada_population.shp*)

SOFTWARE:

- QGIS, ArcGIS Pro

SUBMISSION FORM:

- technical report
- 4 maps in PDF format
- ppx

INSTRUCTIONS:

Part 1a – Geographic Contiguous Cartogram (Map 1)

- Add a layer *Canada_population* to New Project via Data Source Manager (Source Type: *Directory*; Type: *OpenFileGDB*; Vector Dataset: *path to your .gdb*)
- Install *cartogram* plugin (*Plugins-Manage and Install Plugins*)
- Run *cartogram* plugin* (*Vector-Cartogram-Compute cartogram*) on *pop_2021* field (other parameters are in default setting)
- Export the new layer (*CanadaPop_cont_geo_cart*) to ESRI Shapefile format
- Insert the *CanadaPop_cont_geo_cart* layer in ArcGIS Pro
- Add the original layer *CanadaPop* to show the original region borders (use *Feature to Line* tool), symbolize it properly
- Add new attribute *region_abbr*, fill it according to this [table](#), label the features
- Symbolize the layer *CanadaPop_cont_geo_car* using Graduated Colors method with sequential color scheme showing total population
- In *New Layout* (A4 Landscape) insert the Map Title, North Arrow, Legend, Scale and Credits
- Export *Layout* in PDF Format

*see videotutorial [here](#)

Part 1b – Geographic Non-Contiguous Cartogram (Map 2)**

- Use the original layer *Canada_population*
- Install *ShapeTool* plugin (*Plugins-Manage and Install Plugins*)
- Add new attribute *ScaleFactor* and calculate it using following expression:
`"pop_2021"/maximum("pop_2021")`
- Run *Shape Tools* plugin* (*Vector-ShapeTools-Geodesic Transforms-Geodesic Transformation*), set the *Scale factor about the center* parameter according to *ScaleFactor* attribute field
- Export the new layer (*CanadaPop_noncont_geo_cart*) to ESRI Shapefile format
- Insert the *CanadaPop_noncont_geo_cart* layer in ArcGIS Pro
- Add the original layer *Canada_population* to show the original region borders (use *Feature to Line* tool), symbolize it properly
- Add new attribute *region_abbr*, fill it according to this [table](#), label the features
- Symbolize the layer *CanadaPop_noncont_geo_cart* using Graduated Colors method with sequential color scheme showing total population
- In *New Layout* (A4 Landscape) insert the Map Title, North Arrow, Legend, Scale and Credits
- Export *Layout* in PDF Format

*see videotutorial [here](#)

Part 1c – Dorling Cartogram (Map 3)

- Add a layer *Canada_population* to Map (ArcGIS Pro)
- Export the original polygon layer to point layer (name it *Canada_population_point*) using *Feature To Point* tool
- For the point layer *Canada_population_point* set parameters in the *Symbology* as follows:
 - Symbolization Method: Proportional Symbols
 - Fields: pop_2021
 - Normalization: None
 - Template: Circle 2 symbol from ArcGIS style
 - Minimum Size: XYpt (set properly according to the area of the map)
 - Maximum Size: None
- In *Symbology-Vary symbology by attribute-Color* set parameters as follows:
 - Field: pop_2021
 - Normalization: None
 - Color scheme: optional
- Manually move the circles to keep the original topological relationship of regions (you can get inspiration [here](#))
- In *New Layout* (A4 Landscape) insert the Map Title, North Arrow, Legend, Scale and Credits
- Export *Layout* in PDF Format

Part 1d – Demers Cartogram* (Map 4)

- Run the *Generate Tessellation* tool (Output Feature Class: *CanadaPop_squares* (or similar); Shape Type: *Square*; Size: *500 000 square km*)
- In *CanadaPop_squares* layer, add new fields: "region_name" and "region_abbr"

- Assign the names of provinces/territories to each square according to [this schema](#) and fill in the right abbreviations (see [this table](#))
- Join *Canada_population* layer to *CanadaPop_squares* layer, use *name* as Input Join Field and *region_name* as Join Table Field
- Export the joined layer as a new feature class *CanadaPop_squares_data* or similar (*Data-Export Features*)
- Export the new polygon layer *CanadaPop_squares_data* to point layer (name it *CanadaPop_squares_data_point*) using *Feature To Point* tool
- For the point layer *CanadaPop_squares_data_point* set parameters in the *Symbology* as follows:
 - Symbolization Method: Proportional Symbols
 - Fields: pop_2021
 - Normalization: None
 - Template: Square 1 symbol from ArcGIS style
 - Minimum Size: XYpt (set properly according to the area of the map)
 - Maximum Size: XYpt (set properly according to the area of the map)
- For the point layer *CanadaPop_squares_data_point* in *Symbology-Vary symbology by attribute-Color* set parameters as follows:
 - Field: use expression builder to calculate population density
 - Normalization: None
 - Color scheme: optional
- In *New Layout* (A4 Landscape) insert the Map Title, North Arrow, Legend, Scale and Credits
- Export *Layout* in PDF Format

*learn more on pseudo-Demers cartograms [here](#)