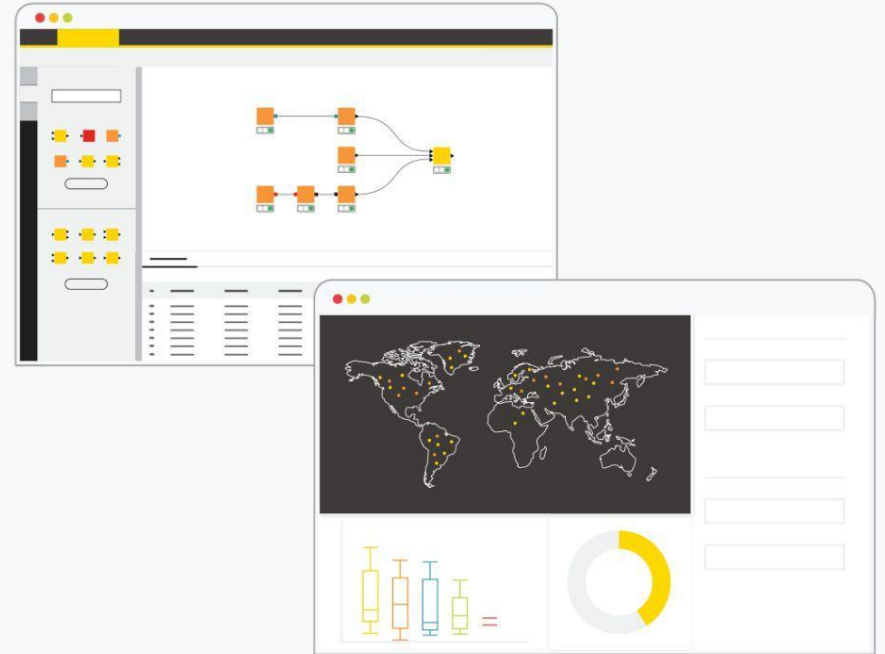


Webinar

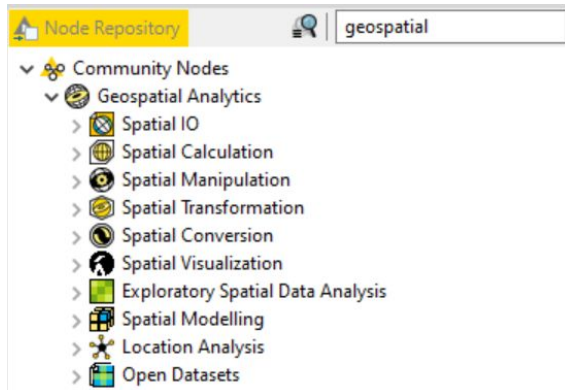
# Geospatial Analytics Made Easy With KNIME

April 13, 2023  
5 PM - 6 PM (CEST)

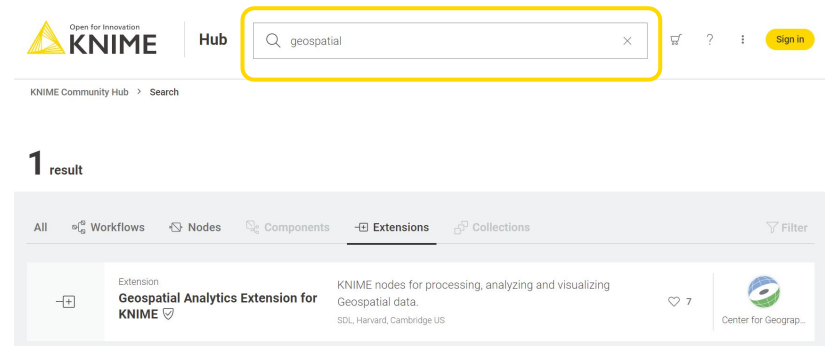


# Geospatial Analytics Extension for KNIME

- From v4.7, Community Extension jointly developed by the CGA from Harvard and KNIME for
  - Reading and writing geospatial files (e.g., shapefiles, GeoJSON)
  - Performing spatial calculations (e.g., computing distances, joining)
  - Viewing data on an interactive map



Drag & Drop



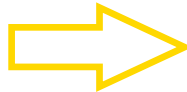
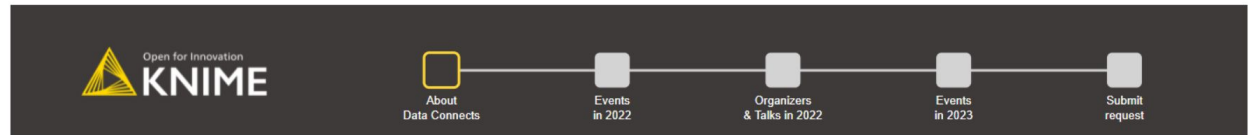
A collection of example workflows on the KNIME Community Hub

**What can the Geospatial Analytics  
Extension do?**



# The KNIME Data Connect Data App

Stage 1:  
About DC  
Events

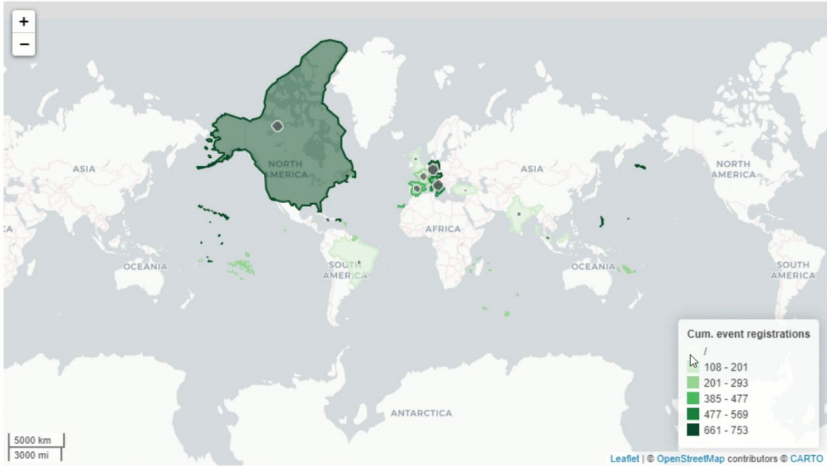
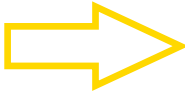
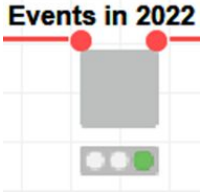


## KNIME Data Connects

Data Connects are events designed to bring together KNIME communities across the world. The events are organized around local [KNIME groups on Meetup](#) with the help of a board of community volunteers. KNIME Data Connects are usually hosted in the majority language of the local community, but everybody is welcome to join any event regardless of the community of origin!

Read more about [KNIME Data Connects](#) or check where and when the [next events](#) are happening!

# The KNIME Data Connect Data App

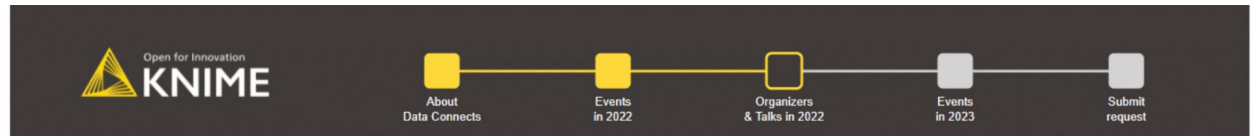


## KNIME Data Connects in 2022

In 2022, the KNIME community organized and attended 18 events in 10 different countries/regions.

Explore the map polygons to find out how many cumulative registrations each country/region had, and the map points to see how many events were organized in each country/region.

# The KNIME Data Connect Data App



## Organizers and Talks in 2022

The community organizers and the KNIMers are the heart and soul of the Data Connect events. They are the local representatives of KNIME communities and help set the event agenda, scout the speakers, coordinate the logistics, and collect attendees' feedback. Do you want to suggest new topic ideas for future Data Connects? Get in touch with them!

The content of the talks in the Data Connects events varies according to the speakers and interests of local communities. From dimensionality reduction to neural networks and applications in Computer Vision, from outlier detection and data extraction from PDFs to use cases in finance, IoT, public administration and life sciences, there's something for everyone. Re-watch the Data Connect events!

### Month

- February
- March
- April
- May
- June
- July
- September
- October
- November
- December

### Region

- Italy
- United States, Canada
- Spain
- Germany, Austria, Switzerland
- France
- India
- United Kingdom
- Turkey
- Brazil
- Malaysia

### Community Board

<b>Walter Bonifazi</b> Region: Italy Date: 2022-09-22 Contact: <a href="#">LinkedIn</a>	<b>Simone Di Gregorio</b> Region: Italy Date: 2022-09-22 Contact: <a href="#">LinkedIn</a>
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### KNIMers

<b>Roberto Cadili</b> Region: Italy Date: 2022-02-03 Contact: <a href="#">LinkedIn</a>	<b>Paolo Tamagnini</b> Region: Italy Date: 2022-02-03 Contact: <a href="#">LinkedIn</a>	<b>Vincenzo Tursi</b> Region: Italy Date: 2022-02-03 Contact: <a href="#">LinkedIn</a>
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# The KNIME Data Connect Data App



## Data Connect: North America - Planned Events for 2023

Input your current location in the US or Canada, and see on the map where the next closest KNIME Data Connect event will take place.

*Note: Please be aware that the list of planned events shown here is subject to changes and includes only locations in the US and Canada. For an up-to-date list of all KNIME Data Connects please visit the [official website](#)*

### Select your country:

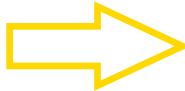
- United States of America
- Canada

Enter city name:

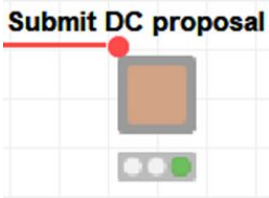
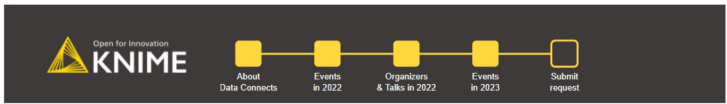
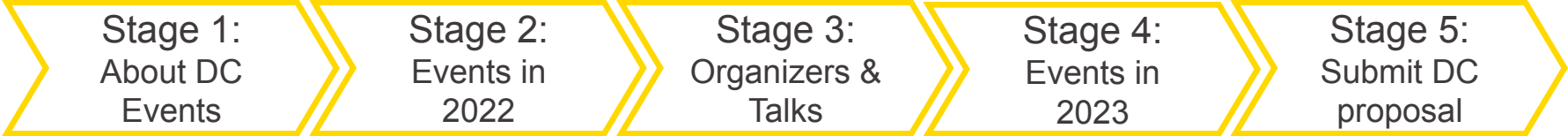
Enter province/territory (CA)

Show Map & Events

### Events in 2023



# The KNIME Data Connect Data App



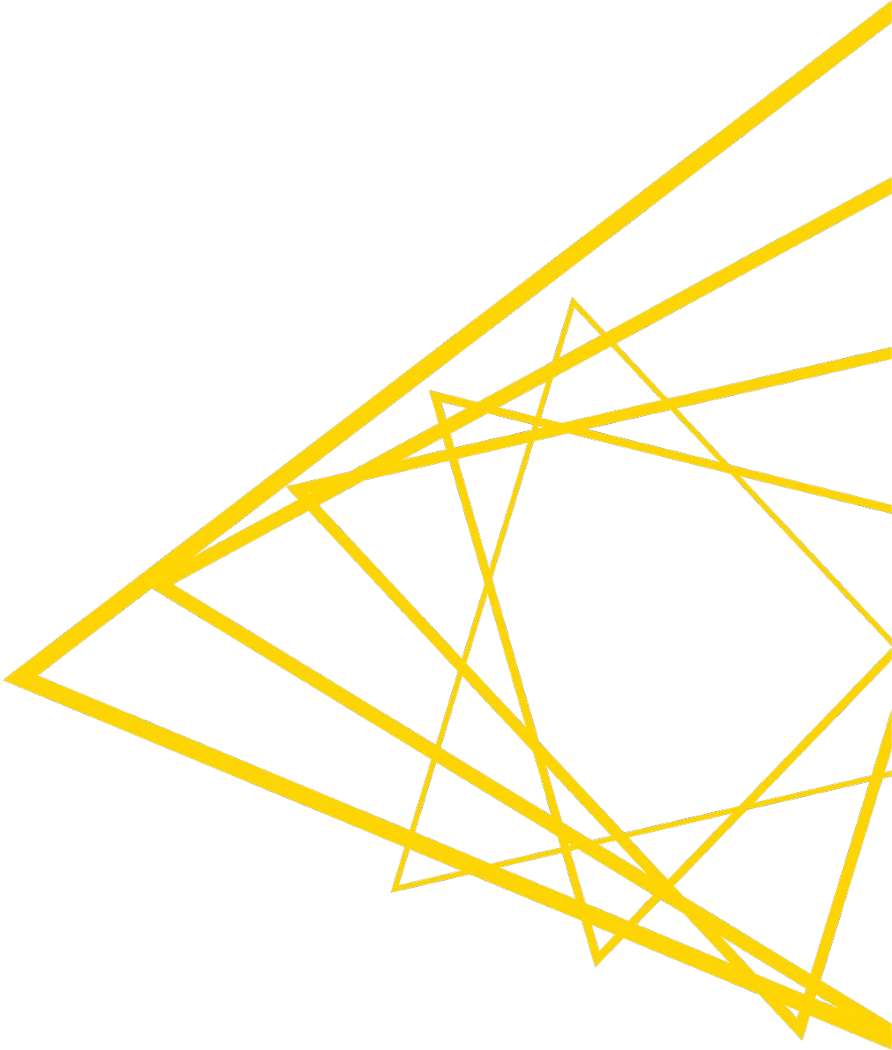
Do you want to organize the next **KNIME** Data Connect?

Submit your proposal!

First name	<input type="text"/>	Last name	<input type="text"/>
Email	<input type="text"/>	Date	<input type="text" value="2023-01-20"/>
City & State	<input type="text"/>	Country	<input type="text"/>
Topic	<input type="text"/>	Comments	<input type="text"/>

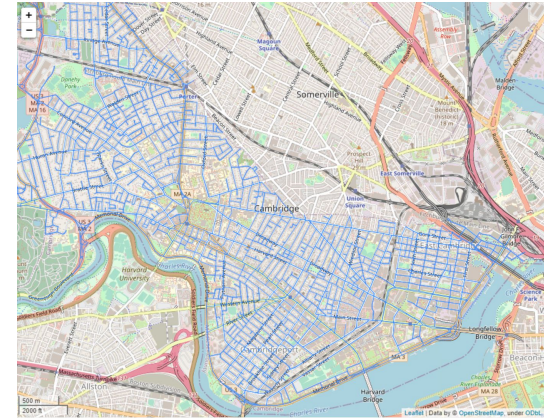
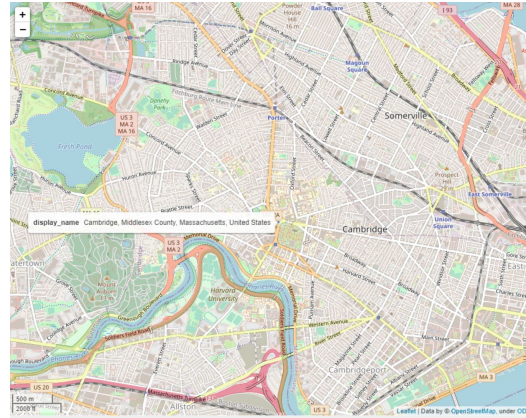
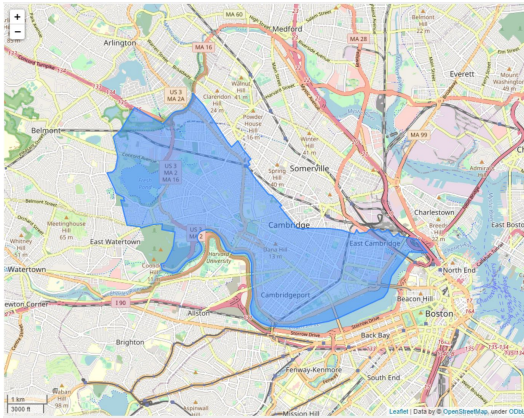


**The Geospatial Analytics  
Extension in five nodes**



# Basic geospatial shapes

- Geospatial analytics relies on three basic shapes:
  - **(Multi)polygons** enclose a city or a country within its geographical boundaries.
  - **Points** indicate just the location without any information on boundaries.
  - **Linestrings** are lines connecting the coordinates of two points.

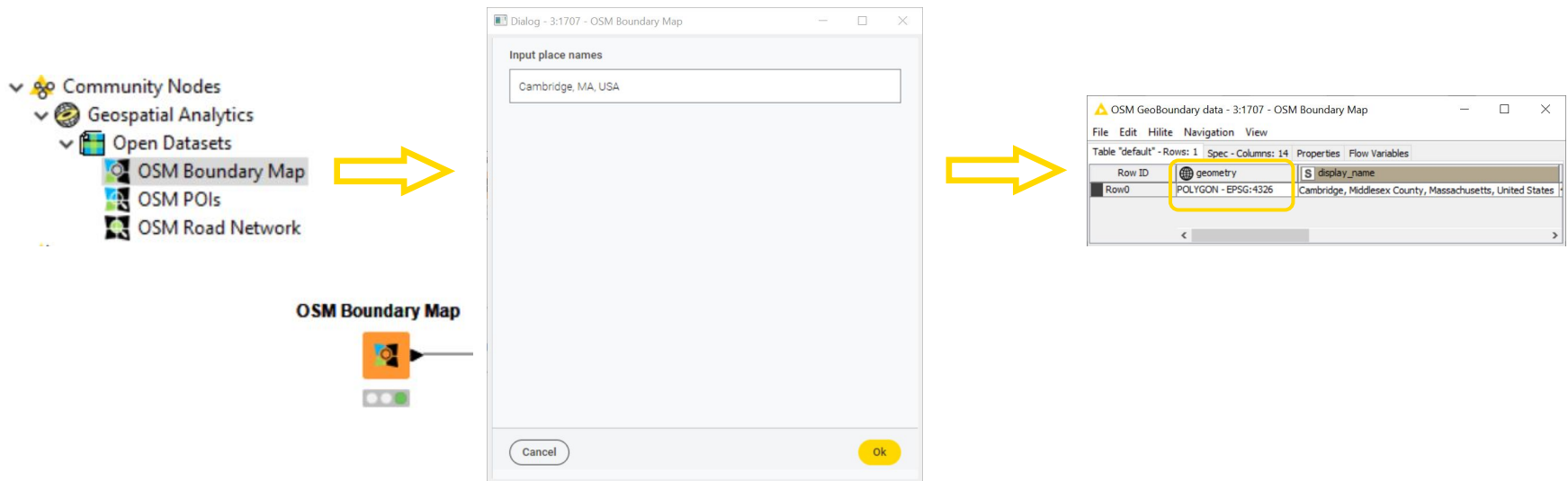


- Points, linestrings and polygons are stored in a new data type: the **Geometry** type.

# Open Datasets nodes to get basic geospatial shapes

- The **OSM Boundary Map** node

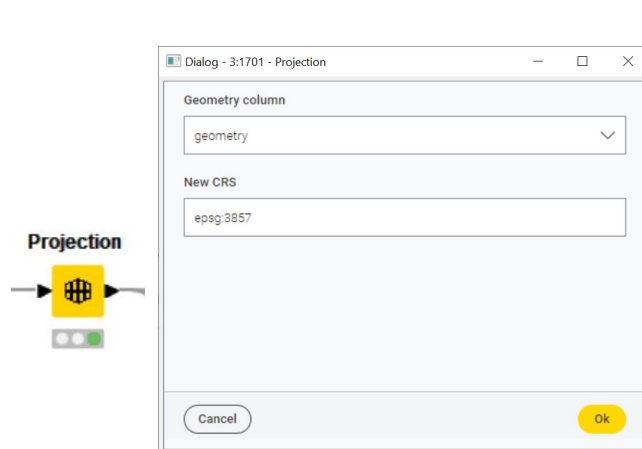
- Takes as input the name of the place, e.g., either country, city, or village.
- Relies on Open Street Map (OSM), an open geographic database, to retrieve boundary information.



# Spatial Transformation nodes

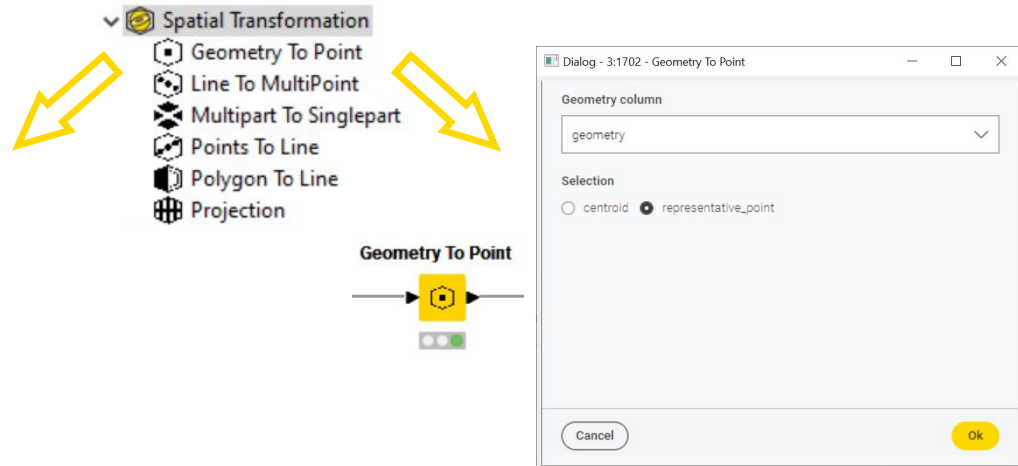
- The **Projection** node

- Coordinates in the Geometry type column are expressed in degrees by default.
- Transforms the Coordinate Reference System of a Geometry into a new system for mapping coordinates (and the related units of measurement, i.e., degrees or meters) using predefined EPSG codes.



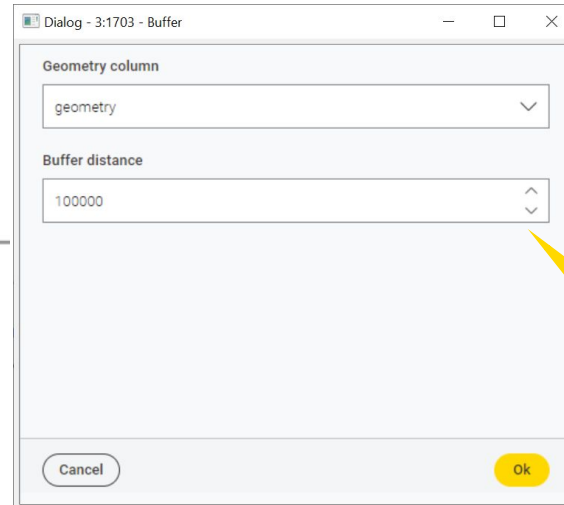
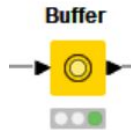
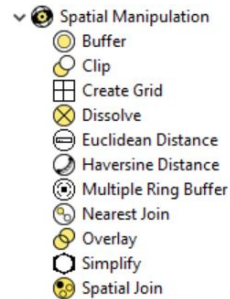
- The **Geometry To Point** node

- Returns a point representing each geometry.
- **Centroids** are calculated depending on the shape of the polygon.
- **Representative points** are fixed and are guaranteed to be within each polygon.



# Spatial Manipulation nodes

- The visualization of a point is usually very tiny and hard to distinguish especially if compared to the size of the country.
- The **Buffer** node
  - Transforms the point into a polygon containing the padding space.



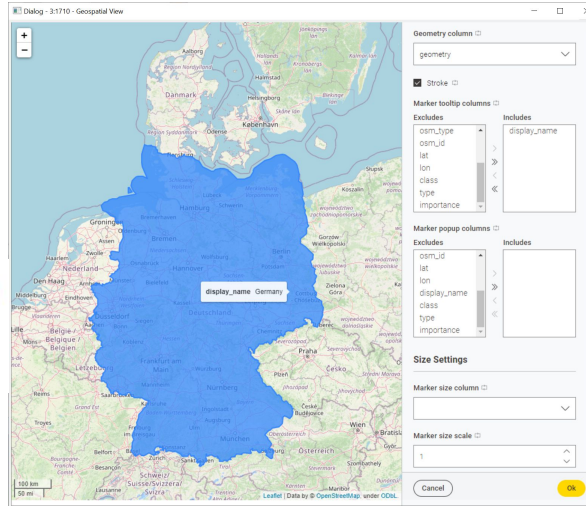
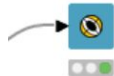
aka buffer size

# Spatial Visualization nodes

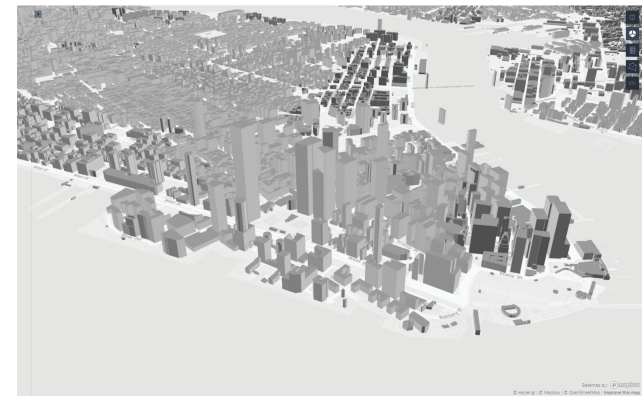
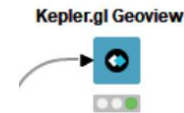
- The **Geospatial View** node
  - Visualizes a polygon or a point object of Geometry type on a world map.
  - Allows to configure marker tooltip, size and color, marker classification method, base map, and legend.

- ▼ Spatial Visualization
  - Geospatial View
  - Geospatial View Static
  - Kepler.gl Geoview
  - Spatial Heatmap

Geospatial View

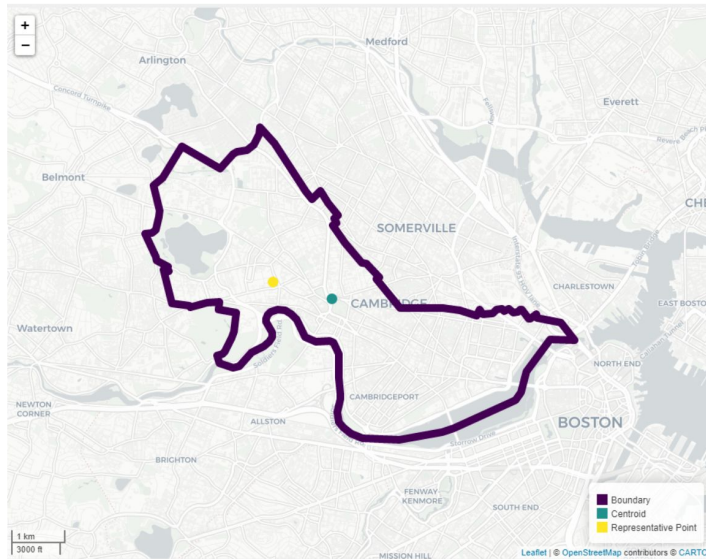


- The **Kepler.gl Geoview** node

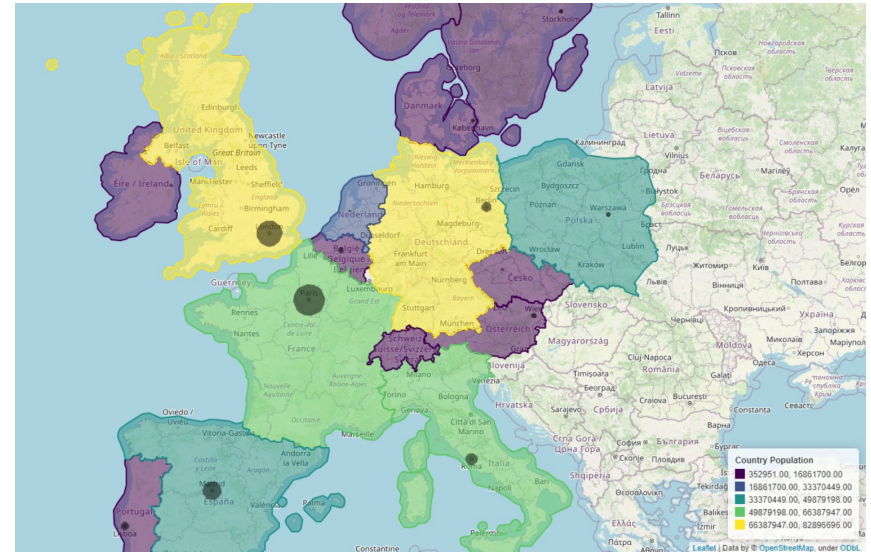


# Live Demo

1. Visualize a location with its points on a map



2. Visualize country population vs. capital city population



# Summary and Q&A

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- In this webinar, we learnt:
  - What geospatial data and GIS are
  - How CGA at Harvard and KNIME teamed up to create a dedicated extension
  - The basics of geospatial analytics via five key nodes
  - How to build a KNIME Data App to visualize and interact with geospatial data
- The Geospatial Analytics Extension for KNIME
  - Available as of KNIME Analytics Platform v4.7 (December 2022)
  - Wraps GeoPandas, Kepler.gl and OSM capabilities
  - Offers node to read, calculate, manipulate, transform, convert and visualize geospatial data

Questions?



# Let's Stay in Touch!



Reception



Stage



Contact us

**Hub**

[hub.knime.com/](http://hub.knime.com/)

**Forum**

[forum.knime.com/](http://forum.knime.com/)



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