RESEARCH ON THE ASSOCIATION BETWEEN LOCATION DESCRIPTIONS AND SPECIFIC TYPES OF CRIME

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SPATIAL DATA LAB (SDL) INTERNSHIP PROGRAM

The Spatial Data Lab (SDL) internship program is designed to provide academic learning experience for high school, undergraduate and graduate students. It offers tailored professional training based on a student's academic or career interests. This internship will provide hands-on experience in utilizing open-source tools, workflow technology, geospatial data, spatial modeling, and their applications across different fields. An internship gives a student the opportunity to experience the entire life-cycle of academic research, gain hands-on experience in cutting-edge technologies, explore career directions, develop technical skills as well as leadership abilities.

Link: https://sdl.gis.harvard.edu/

CONTENT

Link to Github:https://github.com/Rising-Stars-by-Sunshine/SDL-workflow-tutorial.git

BACKGROUND OF THE STUDY

- Different types of crime exhibit spatial clustering, influenced by:
  - Socio-economic characteristics
  - Environmental conditions
  - Human activities
- Crime Pattern Theory
  - Crime is concentrated in locations with features that attract criminal activities (e.g., commercial areas, entertainment venues) (Brantingham & Brantingham, 1981).
  - 50% of crimes occur in 5% of locations, often high-crime areas (Sherman 1995):.
- Crime distribution characteristics vary across locations, with certain areas being more prone to specific types of crimes (e.g., theft in commercial areas, violence in residential areas).

RESEARCH QUESTION

RQ1

What are the distribution characteristics of different types of crime in various locations?

RQ2

Which location descriptions are significantly associated with specific types of crime?

RQ3

How do socio-economic conditions and environmental characteristics affect the spatial distribution of criminal behavior?

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RESEARCH DESIGN

Key idea:
Study systematically analyzes the association between location descriptions and specific types of crime.

Utilizes spatiotemporal data to identify high-risk locations and crime types.

Provides a foundation for targeted crime prevention strategies.

Chicago chosen as the representative city:

• Large, diverse city with varied socio-economic conditions, environmental settings, and urban layouts.

• Ideal for extrapolating crime patterns to other urban areas.

• Extensive history of detailed crime data collection, offering a rich temporal dataset.

• Known for significant crime rates, making it a critical area for understanding factors and developing prevention strategies.

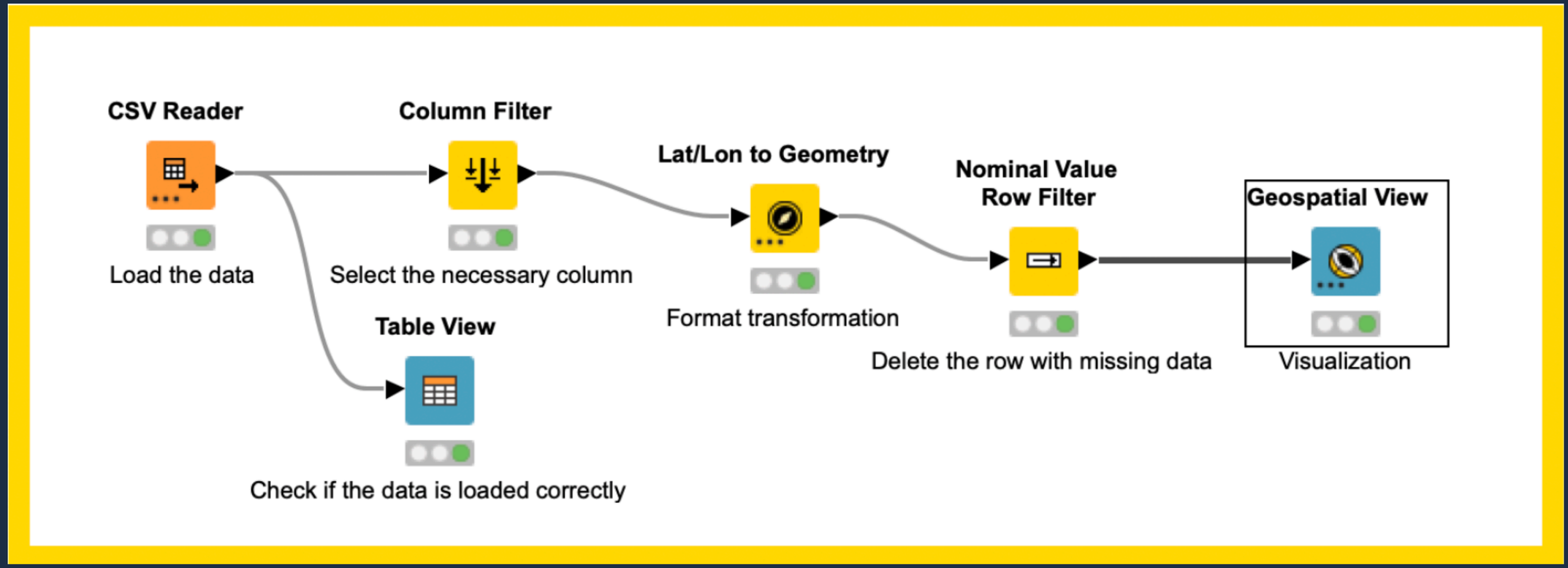
• Broad spectrum of crime types (violent and property crimes) allows for comprehensive analysis of crime-location correlation.

Data Source:
The data is sourced from the Chicago Police Department's CLEAR (Citizen Law Enforcement Analysis and Reporting) system.

PREVIEW OF DATA

ID	Case Number	Date	Block	IUCR	Primary Type	Description	Location Description	Arrest	Domestic	Beat	Ward	FBI Code	X Coordinate	Y Coordinate	Year	Updated On	Latitude	Longitude	Location
13243446	JG462969	10/12/2023 01:50:00 PM	007XX W 31ST ST	860	THEFT	RETAIL THEFT	SMALL RETAIL STORE	FALSE	FALSE	915	11	6	1171721	1884329	2023	10/20/2023 03:45:23 PM	41.838057 21	-87.64537032	(41.838057207, -87.64537 0318)

KNIME WORKFLOW AND CONFIGURATION



CONFIGURATION

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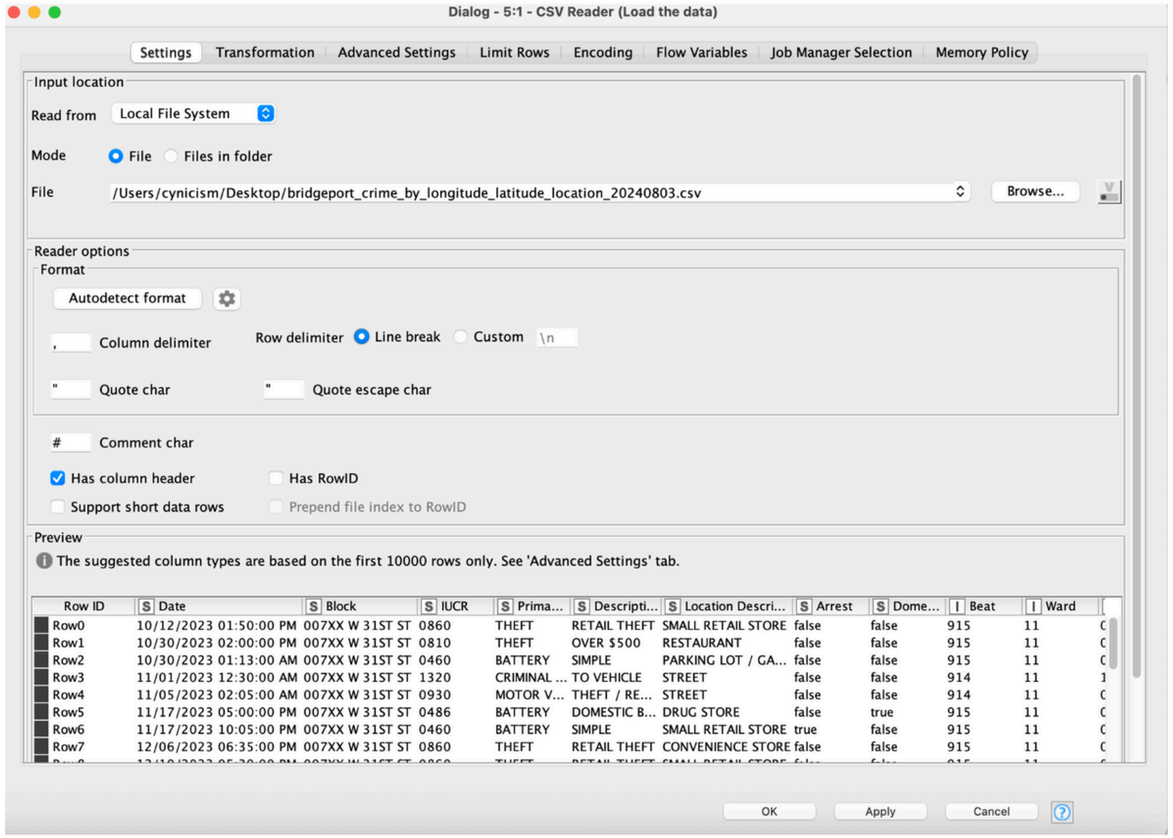

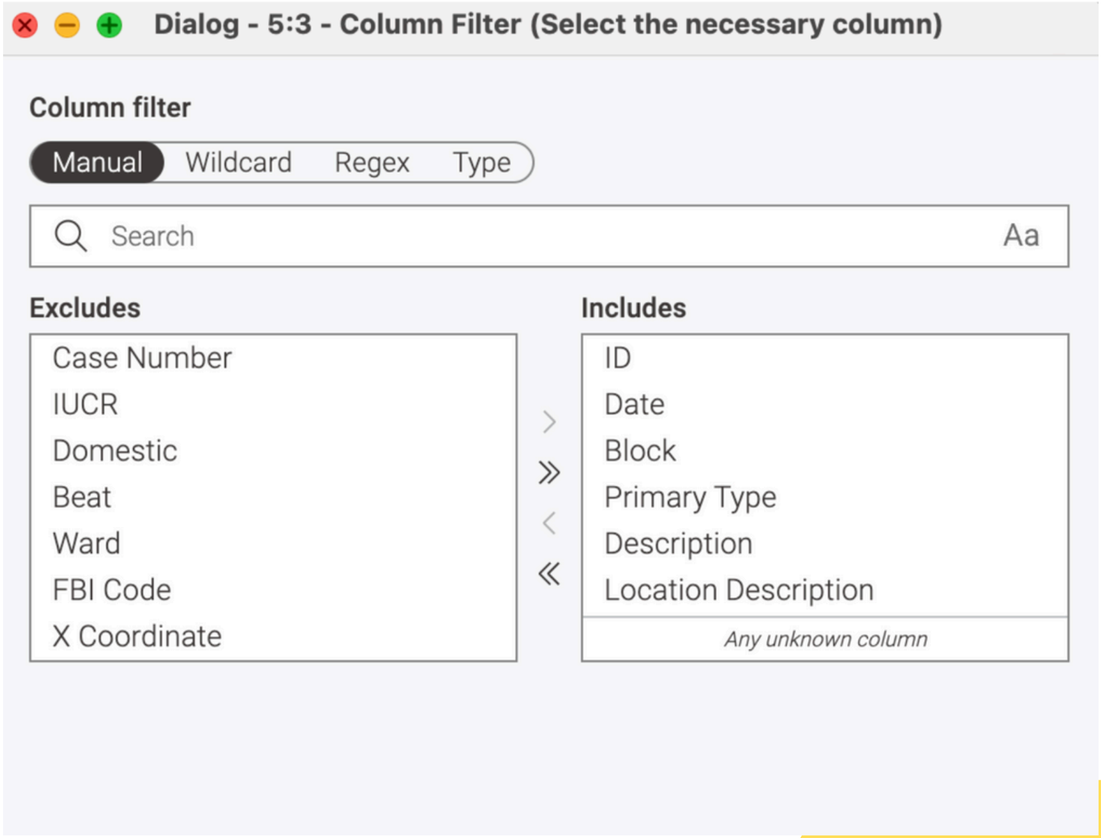

CONFIGURATION

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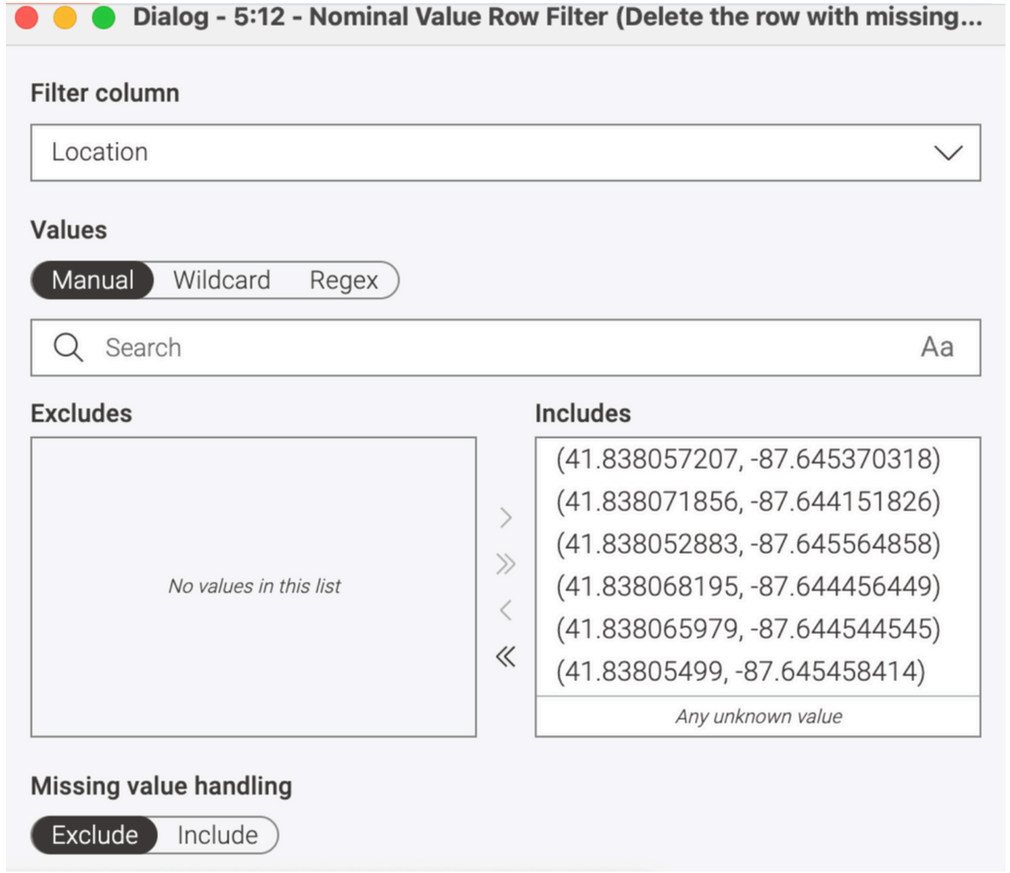

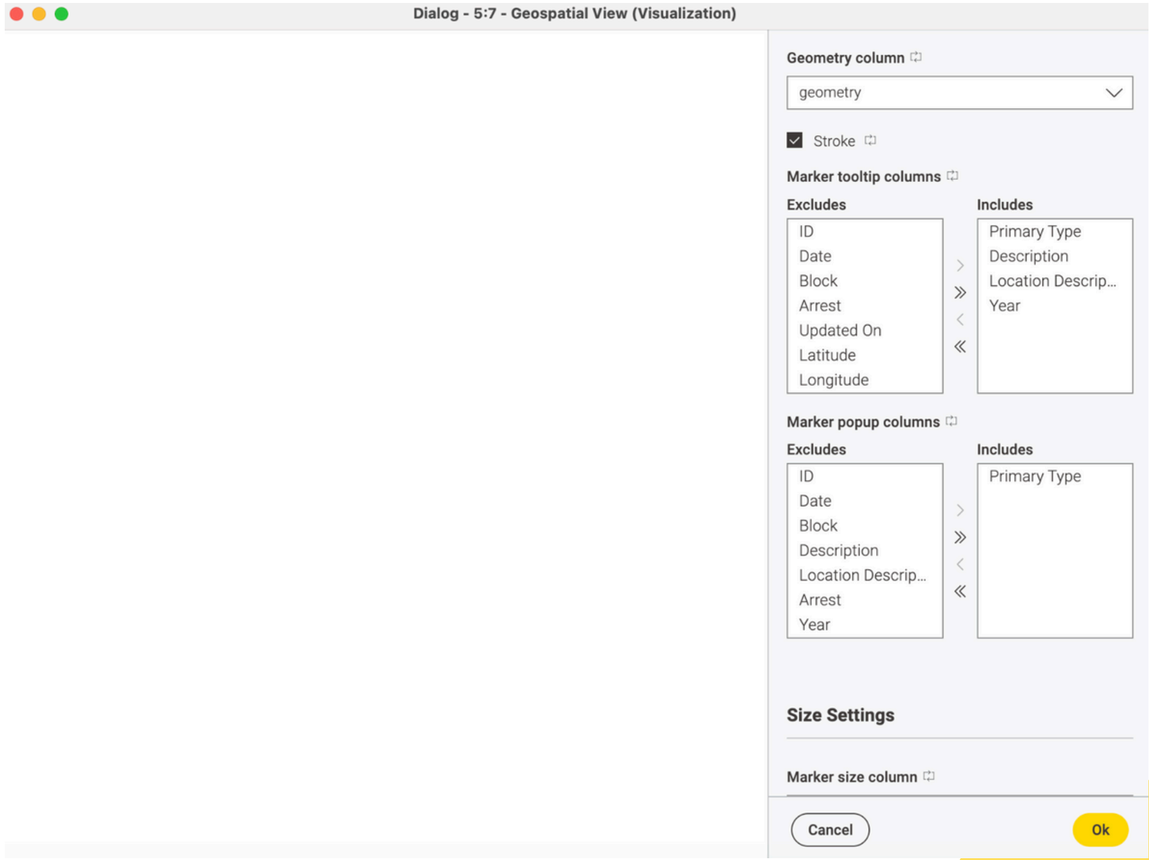

GEOSPATIAL VISUALIZATION

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REFERENCE

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SHERMAN, L. W. (1995). HOT SPOTS OF CRIME AND CRIMINAL CAREERS: A RANDOMIZED CONTROLLED TRIAL. CRIME AND PLACE, 4(1), 35-52.

FELSON, M., & CLARKE, R. V. (1998). OPPORTUNITY MAKES THE THIEF: PRACTICAL THEORY FOR CRIME PREVENTION. HOME OFFICE, RESEARCH, DEVELOPMENT AND STATISTICS DIRECTORATE.