RA, EEq, Asking, Answering, and Assessing Hypothesis

Nicolas Vuille-dit-Bille

11.05.2020

Reference:
https://www.coursera.org/learn/spatial-analysis-and-data-handling-using-arcgispro/resources/SgvlP
https://learn.arcgis.com/en/projects/calculate-environmental-equity-for-public-policy/
https://www.coursera.org/learn/spatial-analysis-and-data-handling-using-arcgispro/resources/EVyLK
https://www.coursera.org/learn/spatial-analysis-and-data-handling-using-arcgispro/resources/dt3jC

Outlining process

1) COVID-19 risk Assessment model for Hong Kong

2) Environmental Equity lab showing all three admin boundaries

3) Exploring Attributes using Enrich to visualize restaurant distribution in California according to other information

4) Moran's I tool in html format

5) Median Household Income data from the Environmental Equity lab

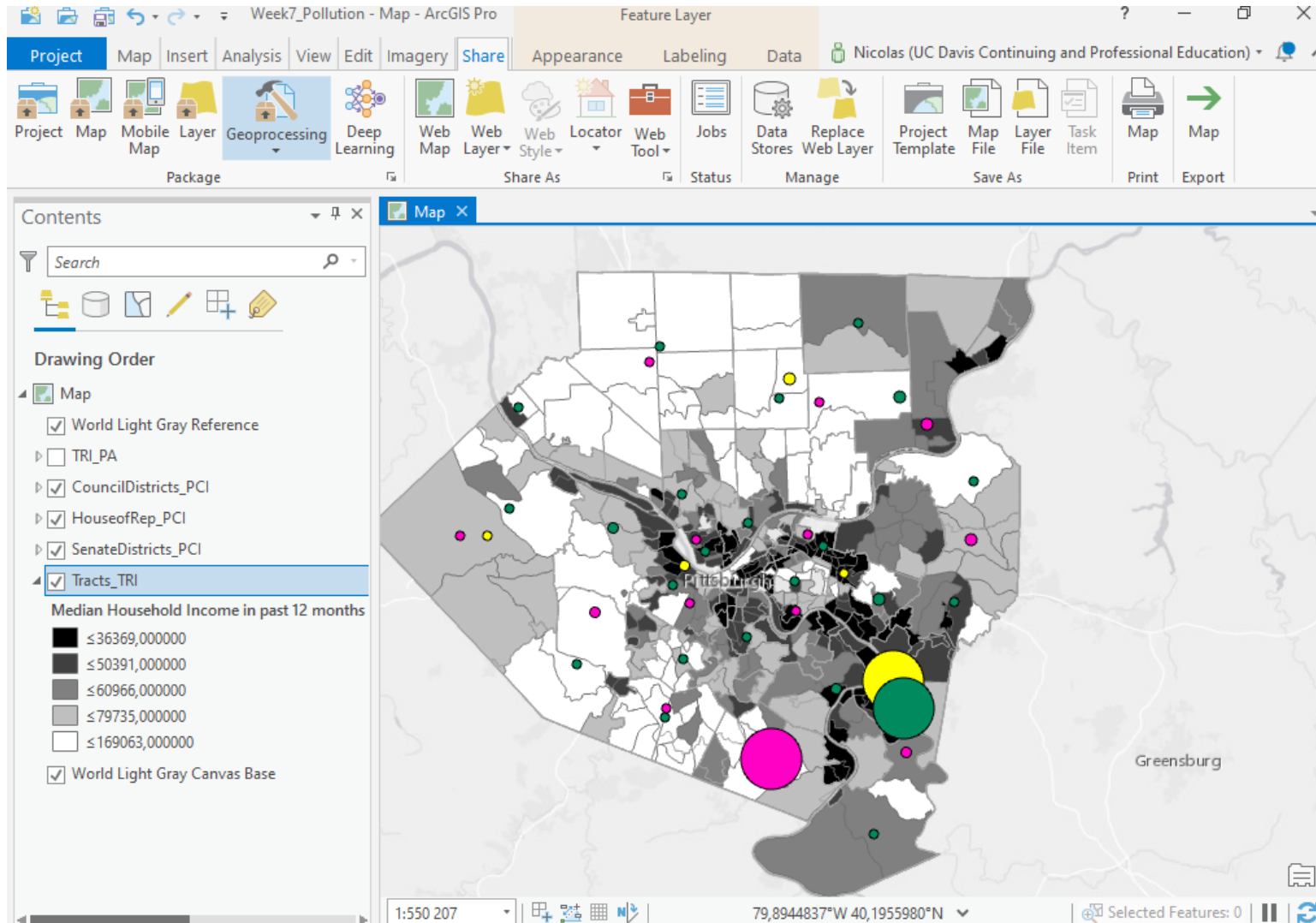# 1) COVID-19 risk Assessment model for Hong Kong

Final output map
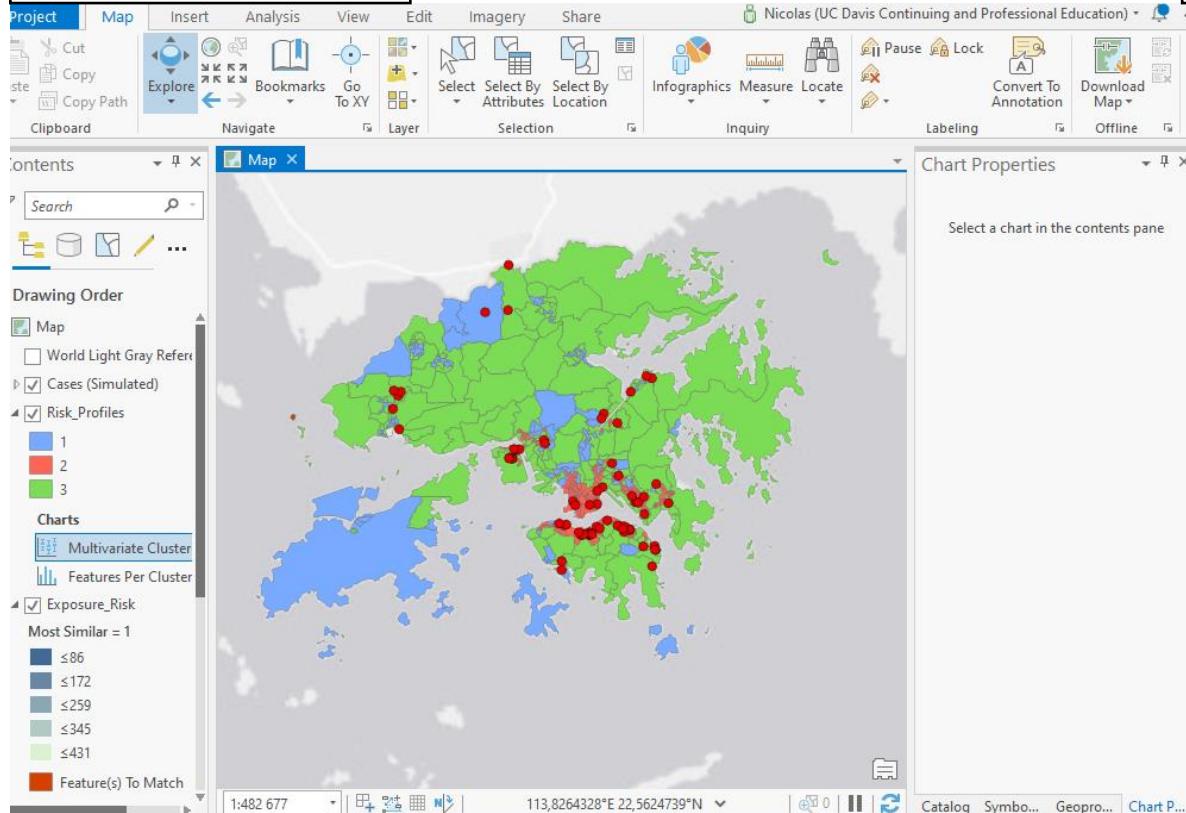
Box plot
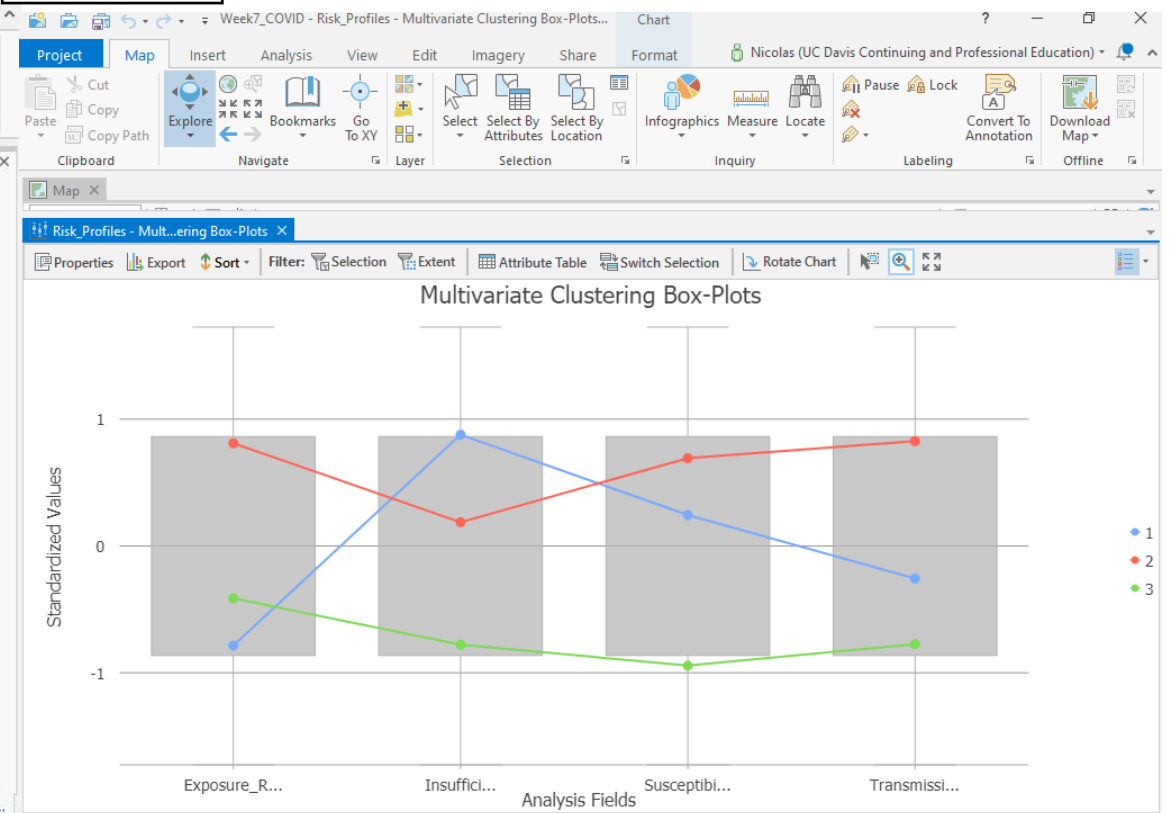
Profile risks:
1: Minimizing interaction and plans organization for quarantine centers and healthcare training (blue)
2: Minimizing interaction (red)
3: low profile risk (green)

2) Environmental pollution equity lab showing all three admin boundaries

Black to white legend according to median income in the census tract

Per capita impacts of total chemicals released on site are showed with graduated symbols

Circle symbol colors indicate districts:
- Senate(yellow)
- House of Representatives (green)
- County city council (pink)

2) Environmental Equity web app

Link:

https://ucd-cpe.maps.arcgis.com/apps/View/index.html?appid=5186de76dc3c43ccbb079318a3cfb02d

3) Exploring Attributes using Enrich to visualize restaurant distribution in California according to total population
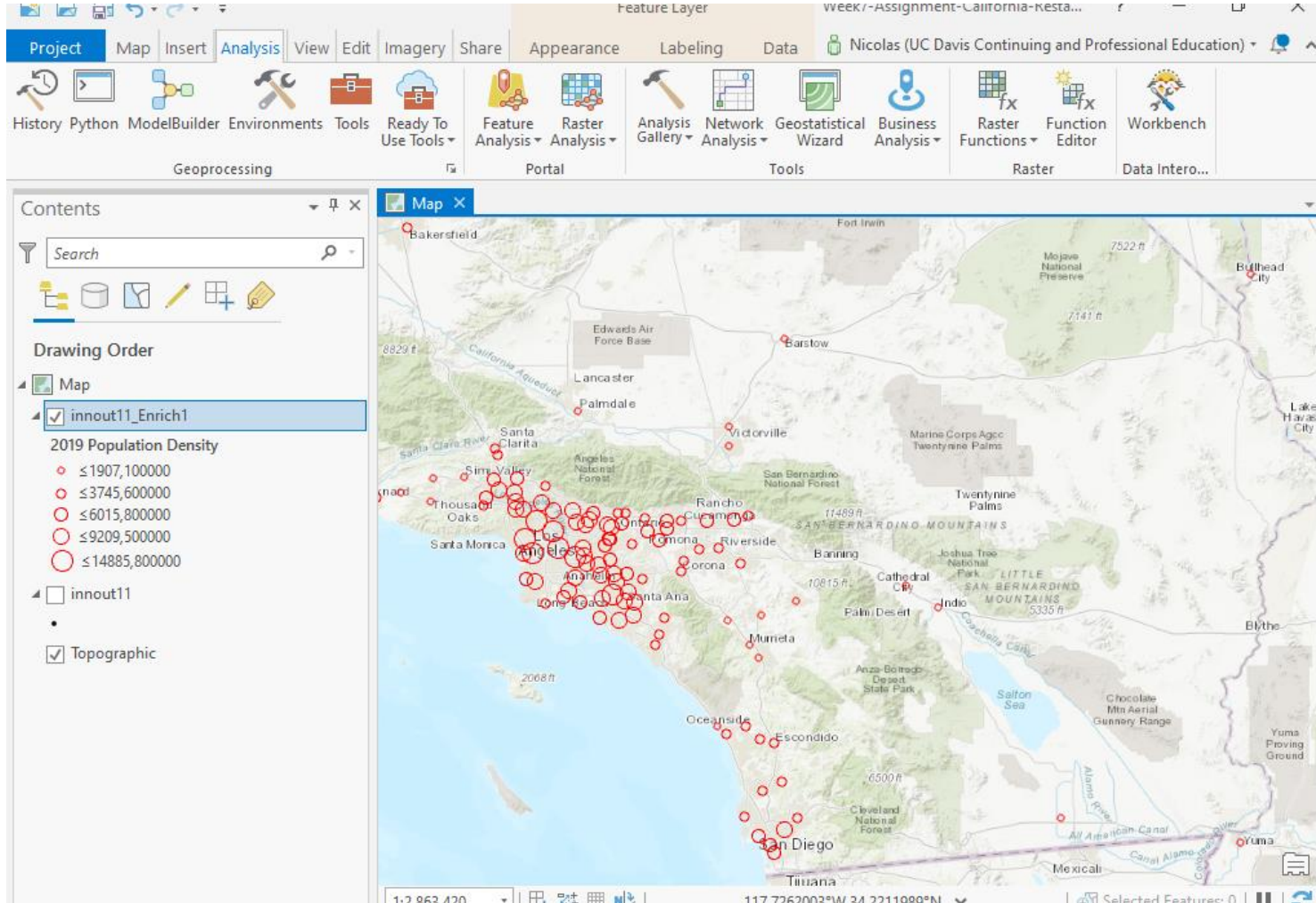
Red circle represents restaurant location in California

Size of circle is increasing with population density in 2019

Agglomeration of restaurant location seem to be linked with population density
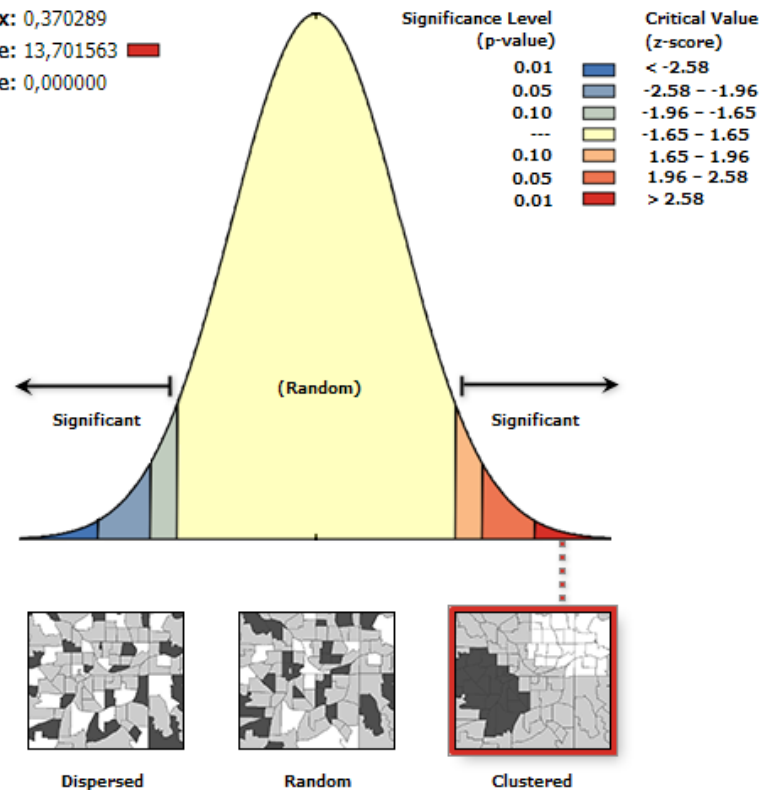
Moran's I tool of income per capita at restaurant location in California

Spatial Autocorrelation Report

Moran's Index: 0,370289
z-score: 13,701563
p-value: 0,000000

Significance Level (p-value)	Critical Value (z-score)
0.01	< -2.58
0.05	-2.58 – -1.96
0.10	-1.96 – -1.65
---	-1.65 – 1.65
0.10	1.65 – 1.96
0.05	1.96 – 2.58
0.01	> 2.58

Significant   (Random)   Significant

Dispersed   Random   Clustered

Given the z-score of 13.701563, there is a less than 1% likelihood that this clustered pattern could be the result of random chance.

H0: The per capita incomes at restaurant location are a result of Complete Spatial Randomness (CSR)

For this variable, the null hypothesis is significantly rejected (Z-score>2.58) and a positive spatial correlation (0.37) is shown

Global Moran's I Summary

Moran's Index:	0,370289
Expected Index:	-0,004717
Variance:	0,000749
z-score:	13,701563
p-value:	0,000000

Dataset Information

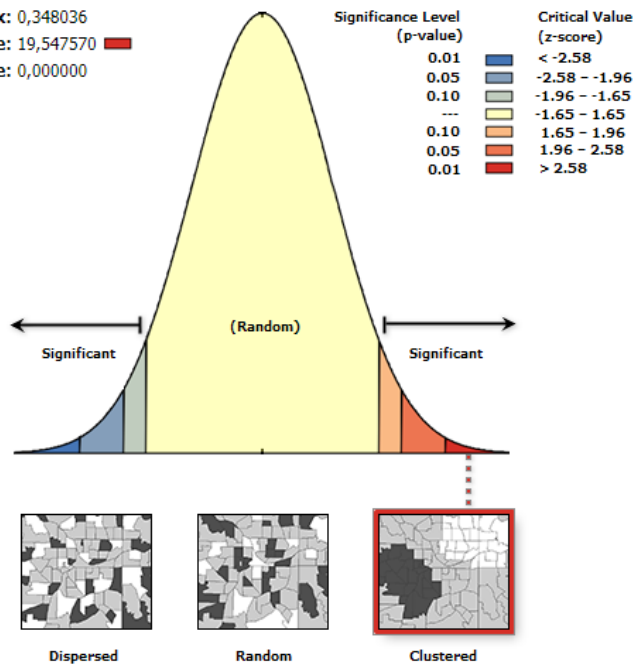|	
Input Feature Class:	innout11_Enrich1_Enrich1
Input Field:	HOUSEHOLDINCOME_PCI_CY
Conceptualization:	INVERSE_DISTANCE
Distance Method:	EUCLIDEAN
Row Standardization:	True
Distance Threshold:	223787,7331 Meters
Weights Matrix File:	None
Selection Set:	False

Moran's I tool of median household income data from the Environmental Equity lab

H0: Median Household Incomes are a result of Complete Spatial Randomness (CSR)

For this variable, the null hypothesis is significantly rejected (Z-score>2.58) and a positive spatial correlation (0.34) is shown. The correlation is however relatively low (<0.5).

Spatial Autocorrelation Report

Moran's Index: 0,348036
z-score: 19,547570
p-value: 0,000000

Significance Level (p-value)	Critical Value (z-score)
0.01	< -2.58
0.05	-2.58 – -1.96
0.10	-1.96 – -1.65
---	-1.65 – 1.65
0.10	1.65 – 1.96
0.05	1.96 – 2.58
0.01	> 2.58

Significant (Random) Significant

Dispersed   Random   Clustered

Given the z-score of 19.54757, there is a less than 1% likelihood that this clustered pattern could be the result of random chance.

Global Moran's I Summary

Moran's Index:	0,348036
Expected Index:	-0,002577
Variance:	0,000322
z-score:	19,547570
p-value:	0,000000

Dataset Information

Input Feature Class:	Tracts_TRI
Input Field:	B19049_001E
Conceptualization:	INVERSE_DISTANCE
Distance Method:	EUCLIDEAN
Row Standardization:	True
Distance Threshold:	7339,8256 Meters
Weights Matrix File:	None
Selection Set:	False