**Introduction to Urban Science**

**Assignment 2: Urbanism as a way of life, and Core-Periphery Model**

**Either**

**Qualitative Exercise:** Sort Essay [~ 500 words]

1. Read Louis Wirth's classic “Urbanism as a way of life”, (link Wirth\_Urbanism\_as\_a \_way\_of\_life.pdf) one of the Chicago’s School of Sociology most famous papers.
2. Based on the text, describe the relationships between population size, density and heterogeneity in cities. Why is heterogeneity relevant? Give two examples of what heterogeneity means. Is greater heterogeneity an accident or a feature?  [~150 words].
3. Describe why urban environments tend to produce a tension and co-existence of

                                Tolerance versus Segregation

                                Community Dissolution versus Political Organization

        It may be helpful to think at what *scales* tolerance vs segregation, community vs. politics happen: Neighborhoods? Or the city at large?  [~150 words]. To keep a city functioning, cooperation must overtake competition on larger scales, you may want to incorporate how in your argument.

1. For modern cities:  what has changed about these tensions and coexistences relative to what Wirth described in 1938?  Specifically, what institutions or behaviors can promote tolerance and political integration above and beyond the often-negative effects of proximity and difference?  Be specific: think of these issues in light of one of our present challenges in your city: such as pandemic response, safety/crime or ethnic/social justice, use a 'causal diagram' (and its feedback loops) to explain your reasoning and include it in your reply. [~200 words]

**Or:**

**Quantitative Exercise:** Solve the "core-periphery" model numerically + discuss:

1. Reproduce the Figures of The Spatial Economy (ch 4-5), and IUS 2.1 (link spatial\_economy\_fujita\_krugman\_venables\_Ch4-5.pdf) shown in this diagram (link Core-Periphery\_Diagram.pdf, this is figure IUS2.4: the discussion in the book should help).  You can use thus python script (link solution\_Core-Periphery.py) or write your own (submit any new code, if you do).
2. Fix transportation costs and the fraction of manufacturing workers to farmers -  T, nMF: how does agglomeration depend on σS ?
3. Fix transportation costs and "taste for variety" parameter:  T, σS, respectively.  How does agglomeration depend on nMF?
4. Fix nMF, σS :How does agglomeration depend on T (transportation costs)?
5. Explain why in words in each case. Present your results in terms of figures with explaining captions.  Your explanations should be brief and can be in the captions.

The code I'm supplying you is a little brittle, especially if you vary σSwidely (σS-> 1 is a numerically tricky limit), so be careful and feel free to make it better.