**Introduction to Urban Science**

**Assignment 3: Psychology & Behavior in Cities; Urban Scaling and its Deviations**

**Either:**

**Qualitative Exercise:**

Read Stanley Milgram’s classic paper “The Experience of Living in Cities” (link Milgram\_Experience\_of\_Living\_in\_Cities.pdf)

 Answer the following questions (< 500 words total):

1. Why is the concept of cognitive "overload" a link between Psychology and Behavior in Cities? [~100 words]
2. How do --according to Milgram-- some behaviors (pick 3) depend on city size, density, heterogeneity? Illustrate them in your own words, in situations not described by Milgram. [~150 words]
3. Knowing this, how can cities develop environments with less “overload” even if they are big, dense and heterogeneous?  How would you set up ways of testing your proposals and measuring results? if you propose quantitative methods, describe what and how to measure them; if you propose qualitative methods, how would you tell unambiguously that overload has been reduced (or not)? (You can use both qualitative and quantitative methods) [~250 words]

**Or,**

**Quantitative Exercise:**

1. Run these python scripts (link plot\_Road\_Surface\_scaling.py plot\_GDP\_scaling.py ) on this data (link roads\_simple.csv gdp\_simple.csv) to perform the scaling analysis of GDP and Road Surface (measured as "lane miles") for US Metropolitan Areas.
2. Make plots of each quantity (road surface vs population and GDP vs population, both in log-log axes; submit plots **with explanatory captions)**.  Identify at least **four cities** that are outliers relative to the best fit line (2 above and 2 below the scaling best fit line). You can describe them verbally or point them out clearly in the plots you submit (you can include these as captions or write separately).
3. Do a little background research and venture hypotheses for these 4 outlier cities: why might they do better/worse than expected by the scaling relation, which characterizes cities on average given their size? Describe what you find in less than 500 words total (all captions and discussion).