MIS 0855 – Data Science (Section 006) – Fall 2017
In-Class Exercise (Day 4) – Creating Your Own Hypotheses

Objective: Develop testable, falsifiable hypotheses that are grounded in a theory.

How can we make Philadelphia neighborhoods safer? In this group exercise, you will come up with hypotheses to suggest what neighborhood characteristics affects the safety of Philadelphia neighborhoods.

Step 1: Explore - individual (10 minutes)

1) Browse Open Data Philly at https://www.opendataphilly.org/dataset.
2) Find the interesting datasets that provide information on Philadelphia neighborhood characteristics.
    a. For example, we can find out how many trees in each Philadelphia neighborhood from Philadelphia Street Tree Inventory at https://www.opendataphilly.org/dataset/philadelphia-street-tree-inventory.
    b. Bike Network dataset (https://www.opendataphilly.org/dataset/bike-network) provides information on which neighborhood is bike-friendly.

Step 2: Prepare – group (15 minutes)

1) In groups of no more than three, create three hypotheses that explain the relationship between neighborhood characteristics and violent crime rates (crime incidents per resident).
2) The hypotheses should be testable, falsifiable, and grounded in a theory.
3) For each hypothesis, provide
    a. a data source from Open Data Philly (with a URL) with which to test the hypothesis, and
    b. a sensible rationale that explain the hypothesis.

Examples

1) Hypothesis: "A Philadelphia neighborhood with more tree experiences fewer violent crimes per resident than other neighborhoods."
    a. Data Source: Philadelphia Street Tree Inventory (https://www.opendataphilly.org/dataset/bike-network)

b. Rationale: A neighborhood with more street trees is safer because trees keep the neighborhood's climate cooler in summer. Most violent crimes usually occur on hot days.

2) Hypothesis: "When there are more bike lanes in a Philadelphia neighborhood, its violent crime rate is lower."
   a. Data Source: Bike Network dataset (https://www.opendataphilly.org/dataset/bike-network)
   b. Rationale: A neighborhood with more bike lanes is more accessible by people and safe to walk because of decreased vehicular traffic. It leads to more pedestrian traffic, which makes it difficult for criminals to commit crimes.

Step 3: Class Discussion (10 minutes)

Each group will briefly report out with their hypotheses developed in Step 2.

Send your group's note to minspang@temple.edu by 11:00 AM.