GEOG 312 – DATA ANALYSIS IN GEOGRAPHY
ASSIGNMENT #2: DESCRIBING DATA IN GEOGRAPHY

This is a relatively simple assignment, but the data that you collect this week will be used throughout the semester, which means that it is important you are careful in your data collection.

Research Question: The University is interested to know how surface temperature varies between the following surfaces:
1) Grass of the Academic Plaza
2) Sidewalk around the Academic Plaza
3) Pavement of Lot 19 (to the west of the Psychology Building)

DELIVERABLES
1. (6% of points) Using the digital thermometers made available by Dr. Allen (in class only), collect surface temperature data for the 1) Grass of the Academic Plaza, 2) Sidewalk around the Academic Plaza, and 3) Pavement of Lot 19. Make sure that you collect the latitude and longitude of each sample in decimal degree (DD) coordinates. Hint: You will get points for this if you do the rest of the assignment.

2. (6% of points) Develop a sampling strategy for collecting your data and provide a description of that sampling strategy and how it is appropriate for gathering a representative sample for each surface that is comparable between surfaces.

1. (8% of points) Enter your sample data into a **CSV file** using Excel, Google Sheets, or another program. Use the ***exact*** CSV template that I provided on eCampus. You should create three CSV tables (one for each surface), each with at least 30 samples. Use the following file naming convention for your CSV tables:
   a. **######_grass.csv**, where "######" is your group's unique 6-digit ID. For example: "**919323_grass.csv**"
   b. **######_sidewalk.csv**
   c. **######_lot19.csv**
   Include these three tables in your final document and upload the raw CSV files themselves to eCampus (see the bottom of this assignment for instructions):

3. (20% of points) Like HW#1, use R to calculate the following statistics for each sample and present in a properly formatted table:
   a. Mean
   b. Standard Deviation
   c. Skewness
   d. Kurtosis
   e. Range
   f. Median
   g. Mode

   Present these statistics in a single table and insert it into your final document.

4. (10% of points) Create a histogram for each surface and present as a single graph or multiple graphs similar to that which you produced for Assignment #1. Insert graphs into your final document.

5. (20% of points) Write a short description of each surface based on the above statistics. The paragraph should look something like the following:

    As presented in Table x, the mean surface temperature of the grass covered Academic Plaza is xx ᵒC, ranging from xx ᵒC to xx ᵒC for a xx ᵒC range of surface temperatures based on a (describe your sampling strategy). The mode of the surface temperatures is xx ᵒC and the median is xx ᵒC, which suggests (describe what it tells you about the distribution). The standard deviation, a measure of xx, is xx ᵒC, which means (describe what the standard deviation tells you). The skewness is xx ᵒC, which means that the distribution of surface temperature is (describe what the skewness means). The kurtosis is xx ᵒC, which means that the distribution of surface temperature is (describe what the kurtosis means).

6. (12% of points) Calculate the following spatial statistics for each surface in R:
    a. Spatial center of each sample
    b. Weighted center of the sample

7. (12% of points) Create an x-y scatter plot (just points) for each surface to show the distribution of the samples as well as the spatial center and the weighted spatial center. Insert the plot into the final document.

8. (6% of points) Provide a short written description of what the weighted spatial center tells you with respect to the spatial center of the sample.

SUBMIT THE FOLLOWING ITEMS (ONLY ONE PER GROUP)

1. Report:
    a. Cover page with assignment title, unique 6-digit ID, and the names of the group members
    b. The deliverables above (please number questions to help me out!). Include any R code you used in your analysis.

2. For this assignment, please submit your raw CSV files using the files naming convention stated in #3 above. Zip your Report and your three CSV files into one zip file and upload this zip file to eCampus before the beginning of class next Thursday.