CE 597 Geospatial Data Analytics

Project 4. Spatial Analytics (10 points)

1. **Given a building shapefile of Purdue campus, make an R program to calculate (you need to implement the formulas, 4 pts)**
    1) the length (perimeter), area and centroid for each building
    2) add the above results as 4 columns associate with each building
    3) do the same with the built-in functions in R by adding another 4 columns
    4) evaluate/summarize the differences (histogram, mean, standard deviation etc)

2. **Given the WL tweets data of year 2014, make an R program to (use built-in functions, 6 pts)**
    1) Find the closest tweets for each building, add the sum (the number of tweets) to that building
    2) For the tweets data frame(layer), associate the closest building ID to each tweet
    3) Find the "busiest" buildings in WL (campus)
    4) Evaluate/discuss the 'busiest' buildings in terms of time period (e.g. day or night etc.)
    5) Show your results with appropriate maps
    ❖ Note – if the distance of a tweet to the closest building is too large, you may want to discard that tweet from this building
    - For spatial operation command, check https://r-spatial.github.io/sf/reference/index.html; there is an "Articles" pull down button. Also look at https://github.com/rstudio/cheatsheets/blob/master/sf.pdf
    - Option – you may download OSM buildings of WL (see my early notes) and use these verse the one I provided (which has only Purdue buildings)

3. **Submission**

1) A report of max 3 pages (use my template; 1.5 line spacing, 12 fonts, 1" margin in all sides; heading/subheadings)
    - Discuss key programming challenges & your solutions (with relevant code included)
    - Discuss/interpret your major findings based on your maps/calculation
    - Main results (figures, plots, tables etc.) that support your discussion
    - Other results can be included as an appendix (not counting towards the page limit)

2) R code with annotations/comments for easy interpretation; **please use relative path**
3) Class presentation: ~4 people on Wed., Oct. 16, 2019
4) All in one zipped file via Blackboard
    - File naming: **LastName_FirstName_Px.zip**;
    - Due: 11:59pm, Friday, Oct. 18, 2019