ECON6027: Assignment 1 (50 marks)

Submission format:

1. Original R script or R markdown file
2. Html/pdf output (knit your script to an html/pdf file for submission, let me know if you have trouble)
3. .txt file of the standard deviational ellipses

# Question 1

1. Load the “cycle\_hire” dataset from the package “spData” which is a point dataset of cycle hire points in central London. (5 marks)
2. Compute a “standard deviational ellipse” of the cycle hire points. (5 marks)
3. plot both hire points and the ellipse on an interactive map using the leaflet driver “OpenStreetMap”. (5 marks)

# Question 2

The “quakes” data.frame (an inbuilt dataset in R) that gives the locations of 1000 seismic events of MB > 4.0. The events occurred in a cube near Fiji since 1964.

1. Give spatial awareness to this dataset. The coordinate reference system should use the world geodetic system. Generate the head of your dataset. (5 marks)
2. Prepare two interactive maps of the recorded “magnitude” and depth of the “location” using “tmap” package. (5 marks)
3. Compute the (i) mean centre, and (ii) the standard deviational ellipse using “magnitude” attribute as weights. (5 marks)
4. Plot the output of (c) on a static map. Give an appropriate title (5 marks)

# Question 3

Variables (in order of appearance):

Planning area name

Total population (thousands)

Percentage of population who are free thinkers

Percentage of population with no literacy

Percentage of population with tertiary education

Percentage of population with only primary education

Percentage of population in white collar jobs

Total number of households (thousands)

Average household size by residents

Percentage of households with a combined income above the median national income

Percentage of households with a combined income above $20,000

Percentage of households with a combined income below $1,000

Percentage of households that are owner occupied

Percentage of HDBs

1. Load the “sg\_house.csv” dataset to R using the read.csv() function. Read the Singapore planning area shapefile from Chapter 1 (shared for your convenience). Combine the two datasets (using an appropriate method). The final object should be an sf object. Your uploaded answer should include a compressed folder of this combined sf object saved as a shapefile. (5 marks)
2. Generate a plot (using tmap) of the attribute, percentage of households above median income given by “PCT\_ABOVEMEDIN”. Your map should, (5 marks)

a. Include an appropriate title

b. Use the quartiles as the “breaks”

c. Change the line type to “dotted”.

1. Extract the central region and create a new spatial object. Create a subset of planning areas in the central region that has more than half the households listed as HDBs. (5 marks)