**Geog592 –Spring 2023**

**Midterm - (March 1, 2023) 11:00AM – 12:15PM**

**Instruction**

Please download the attached midterm.zip to your lab folder and extract it there. **Rename the folder as onyenMidterm**. Please do not share or discuss the exam information with others before next Tuesday. Thanks.

Once complete, please upload your scripts to canvas. You do need to keep a copy in your own midterm folder, in case something goes wrong.

The exam is open book. You can consult online resources, your completed labs, textbooks, etc. However, you should discuss exam questions with any other person during the exam time. Academic dishonesty will be reported.

Please complete all questions first. If you have extra time after completing all questions, you can debug your scripts and fix syntax errors and typos. You will not lose points due to minor syntax errors or typos. However, you will lose points from logical and structural errors. You may use model builder to help with your beginning scripts.

**Question 1** – In the midterm folder, please find the worldcities.txt file. Write a python script (p1.py) to convert all capital cities from worldcities.txt as a shapefile (capitals.shp). Hint: under “capital” column, you need to choose “primary” cities. You are required to use “insertcursor” to complete this question to receive credits.

**Question 2** – In q2.py, first create a 25-mile buffer from LAKES.shp, and save the output file as Lakesbuf25.shp (delete the output file if it exists). Then, select all cities (from cities.shp) which locate in Lakesbuf25.shp and output the result as CitiesInLkBf25. Print out the number of cities in the CitiesInLkBf25.shp. (*Hint result = arcpy.GetCount\_management("roads.shp") will return you the number of features in the roads.shp*)

**Question 3** – In your midterm folder, you can find the cities.shp file. There are three related fields for this question – CLASS, POP2000 and POP2007. In your q3.py, please ask the user to define a population change threshold percentage value (such as 5), and you will sum the total 2007 population for all cities (CLASS=City: choose records with CLASS field value = “city”) which are above the threshold value. You are required to use a cursor object to complete this question.