Lab Assignment 1 – Web Design, Google Earth Pro, KML/KMZ and GeoJSON

Due Date: 12/10/2018

Part I: An Example of Internet GIS

Your first task is to search and find an example of Internet GIS application. Then, you will describe, explain, and share with the rest of the class by posting the information on the Discussion Board on ELMS. In general, you will try to answer the following questions:

- What is the subject or title of this Internet GIS application?
- Who or which organization designed it or is hosting it?
- What is this application used for?
- What are the targeted users?
- What are the major functions or features?
- What software or technology was used to design this application?

It is possible that you may not be able to find all of the answers. The bottom line is that you should provide a sufficient description before other people decide to click on the link. This exercise should help you get started thinking about what you might do for your own final project.

Note: If you are having trouble finding examples of Internet GIS Application take a look through. http://gisuser.com/

Your tasks:

- Post the link and a brief introduction of the example on the Discussion Board. You may as well pick one from your top 3 GIS Applications on the first topic of the discussion board.
- Create a Word document in which you should include the description of the Internet GIS example that you have found. You may want to include some screen shots to help you explain or describe.

Part II: Designing a Website

In this exercise, you are required to design a website that will be used to organize your lab assignments and also the final project. You will expect to improve and update this site over the entire semester. Here are some examples from the same class in previous years:

- http://terpconnect.umd.edu/~pamani/GEOG677/index.html
- http://terpconnect.umd.edu/~mhumber/labs.html

The goal of this specific assignment is to build a Web site that not just works but show a modern design. You can use any techniques or tools to complete the task. So, be creative!

The minimum requirements for this website:

- You can use any technology options to design this web site. Ideally, you should practice HTML, CSS and JavaScript during the process.
- There must be a self-introduction in text format on the homepage. It is similar to a bio.
- There must be a picture of you.
- There must be a title (it is the web page title defined by HTML tags, not a title for text) for every webpage you create.
- There must be at least three web pages.
- Most importantly, you need to design the layout so that it will help you organize all the Web pages that you are going to create for other lab assignments as well.

Note:

- If you are still not familiar with Web designing, check the last week's lab material about HTML, CSS and JavaScript that have been posted to the ELMS.

Part III: Publishing a Website

To publish a website, you will have to have a space on a Web server. Many of you may not be aware that every student or faculty/staff has been allocated some storage space (~10MB) on a UMD server: **terpconnect.umd.edu.**

Once you finish creating the Web page files, you will need to upload these files to the server. There are different ways of doing it:

- through a graphical SFTP client
- through a command line SFTP
- Through mapping drives to "H:" if you work from a computer lab on campus

The best option is to use a graphical SFTP. There is a free program called WinSCP available. WinSCP is an open source free SFTP client and FTP client for Windows. Its main function is safe copying of files between a local and a remote computer.

WinSCP can be downloaded from here: https://terpware.umd.edu/Windows/Package/2044

From this web page, you can also find the information about how to install WinSCP.

It is particularly important that the web files must be uploaded and saved under a folder called "/pub" on the server. Otherwise, the web server will not recognize your web file if they are saved in different folders.

Be sure to transfer all the files that are related to your website to the server, including HTML files, documents, images, etc.

Also make sure the file/folder structure on the server should be the same on the local computer when you created them. Otherwise, there will be broken links when certain files are miss-placed in different folders. So, it is important to maintain the relative path of all of those files.

Once you are done with transferring those files, now you can test your website. Just open a Web browser and type the URL in the address bar: http://www.terpconnect.umd.edu/~userID (replace the userID with yours). It should work!

Note:

- If you are not familiar with Web designing, you will find a supplement document about HTML that has been posted under the same folder on ELMS.

Your task:

- Write down the URL of your website and then a few important screen shots of the web pages.

Part IV: Google Earth Pro

Your first task is to go to here and download Google Earth Pro:
https://www.google.com/earth/desktop/

When installing, you can just follow the instructions on those pop-up windows. There is one step that will ask you to select setup type, make sure you check "Complete".

Even though Google Earth provides standardized user interface, it still can be overwhelming to use it because there are so many buttons, menus, and options. Therefore, you may want to spend some time to read the User Guide (below) and do some testing.

- http://support.google.com/earth/bin/static.py?hl=en&page=guide_toc.cs

Part V: KML

KML refers to Keyhole Markup Language, which is a file format used to display geographic data in an Earth browser such as Google Earth, Google Maps, and Google Maps for mobile. KML uses a tag-based structure with nested elements and attributes and is based on the XML standard. All tags are case-sensitive and must be appear exactly as they are listed in the KML Reference.

1. Getting to Know KML

KML was developed for use with Google Earth. However, it can be displayed by many other applications including: Google Maps, Google Maps for mobile, NASA WorldWind, ESRI ArcGIS Explorer, Adobe PhotoShop, AutoCAD, Yahoo! Pipes, and so on.

If you are not familiar with KML, before you start next session, you might want to check out this KML tutorial: http://code.google.com/apis/kml/documentation/kml_tut.html

Also, you can even test some KML samples by using Google Earth which you have installed. The samples can be found here:
http://code.google.com/apis/kml/documentation/KML_Samples.kml

2. Creating KML

There are many different ways of creating KML files. Obviously, you can simply write KML codes just like HTML. And, you can also create KML files with Google Earth Pro. In addition, you can create KML using some software such as ArcGIS. These last two options are the simplest way of creating KML because you don't need to deal with coding. However, you may pay a price of not being able to control what exactly you want to do.

Now let's try the first option.

The typical file structure of KML is as below:

```
<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://www.opengis.net/kml/2.2">
<Placemark>
 <name>New York City</name>
 <description>New York City</description>
 <Point>
  <coordinates>-74.006393,40.714172,0</coordinates>
 </Point>
</Placemark>
</kml>
```

Your task:

- You are required to modify the KML file by: (1) first selecting a location that you like; (2) obtain/convert the coordinates; (3) re-write the part of codes for Name/Description and coordinates within the KML file. Lastly, you will upload the KML file to the TerpConnect server and then create a link to it on one of your Lab 1 web page.

Part VI: Using Google Earth to Create KML

You can also use Google Earth to create KML. This is actually easier because it does not involve coding.

Your task:

- You will create a KML file for George Washington University, the White House, and the Washington Monument respectively.
- You will need to use the customized images or logos.
- You will need to add your own descriptions for these three landmarks. Be sure to include the author's name (i.e. you) at the end of description so that I know it's your work.
- Make sure your user ID is part of the file name.
- Upload the KML files to the TerpConnect server and then create corresponding links on one of your web pages.

Part VII: Using ArcGIS to Create KML

There has been some collaboration between Google and ESRI. One of the examples is that KML can be created with ArcGIS (i.e. ArcMap) and also be displayed by ArcGIS (i.e. ArcGlobe).

To create KML using ArcMap, there are two ways.

1. **Creating KML with the Default Conversion Tool in ArcGIS**

Add the two data layers – "PG_Hospitals" and "PG_CensusTracts".

Change the symbology to make the map informative. The census tracts should be displayed based on the 2000 population.

Your task:

- You will create two KML files (with .kmz extension). Make sure your user ID is part of the file name. Upload the KML files to the server and then create a link to each on one of your web pages.

2. **Creating KML with the Extension Tool in ArcGIS**

One of the drawbacks of using the default conversion tool provided by ArcGIS does not retain some more advanced symbology effects. So, it is only logic to look for a better way to create KML files using ArcGIS.

First, go to this website:
http://www.arcgis.com/home/item.html?id=e8e62bf409ae4bc997632c654382de04

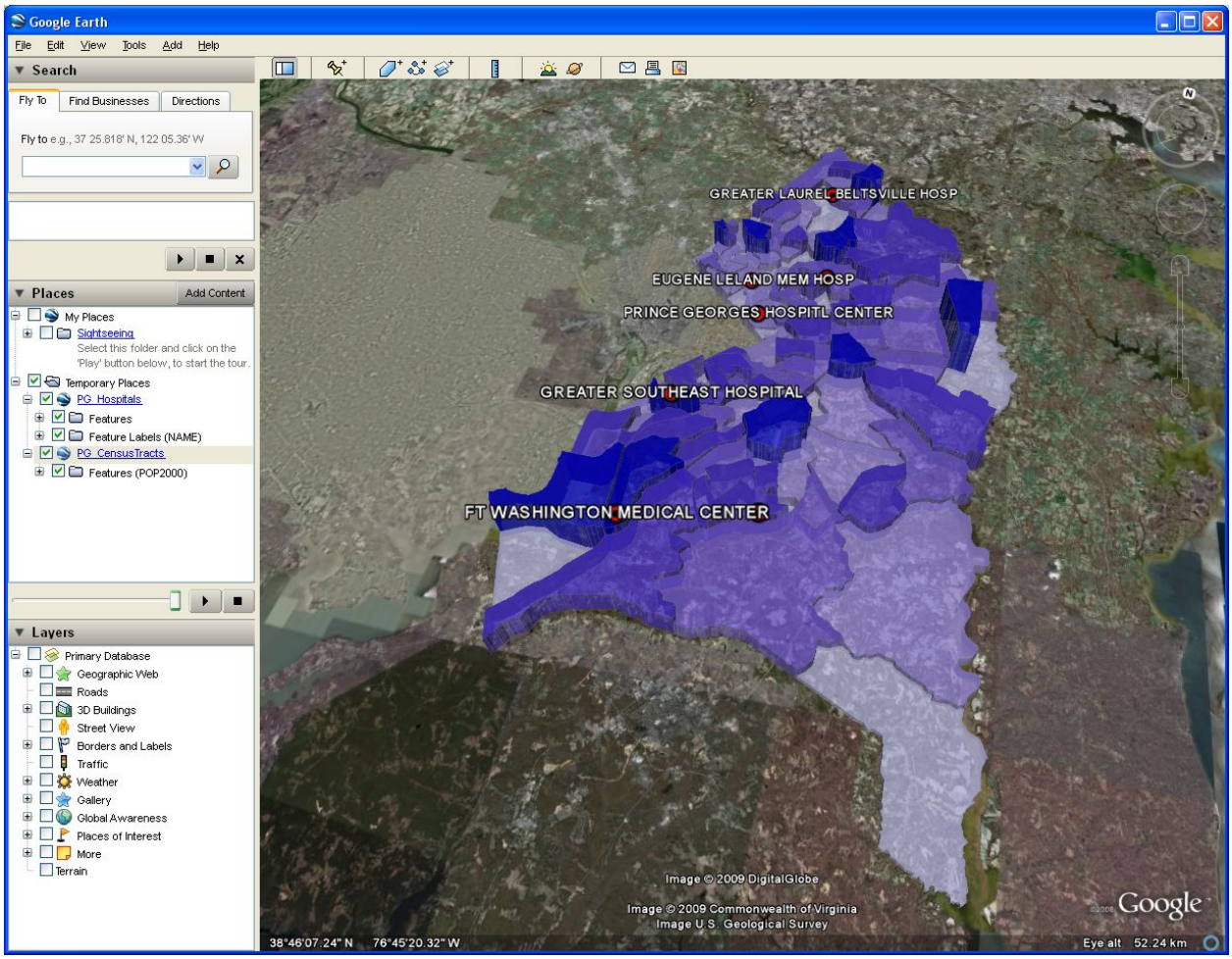
The script that we are going to download is Export_to_KML_V2_5_5. This is the latest version.

After unzip, read the Export_to_KML_documentation.pdf carefully. It needs extra steps to run it on Win7/Vista and ArcGIS 10.

Important! Before the installation, make sure you turn off ArcGIS.

Your task:

- You will create two KML files. Upload the KML files to the server and then create a link to each file on one of your web pages.
- For the census tract data, you will create 3D based on the population (see example below).



Extra Practice:

- If you have Google Earth Pro, you may want to try to use the Movie Maker to create an animation.

Part VIII: Create GeoJSON file

A GeoJSON file can be created from and IDE, Quantum GIS (QGIS) or GeoJSON Webpage.

1. Access http://geojson.io page and create a point, line and polygon on the map. Give each feature attributes that correspond to that location.
2. Save the GeoJSON file by selecting, "Save" > "GeoJSON"

Tasks:

- Load the GeoJSON file created in #1 on the TerpConnect server and create a link to it on your Lab page.

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