EPPS/GISC 4317/6317: Intro Programming for Social Science

**Instructor: Dr. Bryan Chastain**

**Due Date: Two Weeks from the Date Being Assigned**

**Midterm Project**

OBJECTIVES

Your midterm will have three components spanning the material covered thus far in class.

**Real Estate**

You are a real estate agent who has clients who are interested in buying a new house in Collin County near UTD. It is a hot market, so you cannot wait for homes to go for sale. Instead, you want to find existing homes that meet your clients’ criteria and then ask the owners if they are interested in selling. Your clients want a single-family house (state\_code=’A1’) with at least 1500 sq ft of living area (“living\_area”) and a market value (“market\_value”) between $250,000 and $350,000. They also have children and want to live in the area zoned to Aldridge Elementary (CAMPNAME=’ALDRIDGE EL’).

A file named “parcels.py” has been provided to you that contains a variable named parcels which is a list of dictionaries. Each dictionary contains the above-mentioned keys, as well as street\_address for a parcel. To access this data in your script, you just need to import this file and then you should be able to use the parcels variable (from parcels import parcels).

Undergraduates: Write a Python script to print the count of houses that meet the criteria as well as a list of all the addresses.

Graduates: Write a Python script to print the count of houses that meet the criteria as well as a list of all of the matching addresses. You also need to prompt the user for each criteria (state code, living area, min & max cost, and elementary name). For living area and cost, make sure the user enters valid numbers and ask them to retry if invalid entry is detected (no crashing!).

Deliverables:

* Python script file, commented appropriately, in PEP8 format, with name on top.

**Coordinate Conversion**

Write a script to convert Decimal Degree (DD) latitude/longitude coordinates into Degree-Minute-Second (DMS) coordinates. There is a demo program attached:   
 latlong4317.exe (For Undergraduates)  
 latlong6317.exe (For Graduates)

Your program should behave in an identical fashion, taking input coordinates in DD format and outputting them in DMS. The script should return an error message if the user inputs invalid coordinates (e.g. letters or numbers out-of-range). Graduates should prompt the user to run another conversion when finished.

(Hint: <http://en.wikipedia.org/wiki/Decimal_degrees> for conversion formula)

(Another hint: to print the degree symbol in Python, you need to refer to it by its Unicode value, so try printing this: u"\u00b0" [one u inside the quotes, one outside])

Deliverable:

* Python script file, commented appropriately, in PEP8 format, with name on top.

**File Manipulation**

Write a Python script that opens a CSV file and prints out the contents with tabs delimiting the columns for proper spacing. You should write a function that accepts the filename as the parameter that does the actual work of opening and printing. The main body of the script will just call this function for opening/printing. It should work on any CSV, not just the one provided.

Undergraduates: Ask the user what CSV file to read/print. Pass this file to your function to print the results. You can use the attached countries.csv as a test (but do not hard-code references to it). Make sure the script does not crash if the file does not exist.

Graduates: Ask the user what directory to search for CSVs in. Search through all child directories as well. For each CSV you encounter, pass to your function to print it out. Make sure the script does not crash if the directory entered does not exist or if no CSV files are found.

(Hint: the os module & os.walk())

Deliverable:

* Python script file, commented appropriately, in PEP8 format, with name on top.

**Other Notes**

Unlike other assignments, this project should be done completely independently. Think of it as a take-home exam. Also, we will not have a lecture next week, so that you can devote your time to this project. Please use that time to work on the project, and don’t wait until the day before to start – you will NOT be able to finish it in one day. This is a strict deadline, and any late submissions will be penalized. **If you use any code from the Internet, please cite your sources and document what exactly it is doing**!

**By typing my name here, I affirm that I will not and have not communicated in any way (email, phone, person-to-person, etc) with any person in completing this exam.**

Name: \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_