

Central Washington University
College of the Sciences
Department of Computer Science
CS-301 Data Structures Fall 2016

Project 2

As usual, please read the “Guidelines” document on how to turn in this project.

Due date: Wed Nov 2, 2016 11:59 pm

1. The file *cities.txt* contains a hodgepodge of cities from different countries, together with the population and other information. You may use this small file (containing realistic data) for testing purposes, but your program should work with other similar test files, user specified. Your program must define the classes `City` and `Country`. `City` just reflects the file contents,

```
name  province department country population
```

plus perhaps some accessors and mutators. The `Country` class must have at the very least the following fields

```
public String countryName;  
protected ArrayList<City> largeCities    // > 500K  
protected ArrayList<City> mediumCities   // > 100K  
protected ArrayList<City> smallCities    // > 20K
```

Very small villages are left out. Your program must create an array (or similar data structure) of `Country` out of the file. No more than 20 different countries will be on a single file. Proper methods for display must also be implemented. Your main must display:

- the different countries,
- its largest city with population,
- the number of small, medium and large cities.

Upon request, for a given country and city type, all the corresponding

cities must be displayed, together with its population. At your discretion other things may also be displayed.

2. Write a program that divides *arbitrarily long integers* by a single decimal integer. *You are not allow to use any form of division or multiplication or mod operation.* Use the data structure of your preference. You must write two versions of it, a recursive one and a non recursive, given the choice to the user which method to use. Also the program must read the long integer from a file, that the user is prompted for. The divisor is read from the standard input.