CECS 229 – Lab 3/ HW 5

Complete task 2.12.1 to 2.12.6

Please find the following 'voting_record_dump109.txt' here:

http://resources.codingthematrix.com/

In case you don't have the book:

Reading in the file As in the last lab, the information you need to work with is stored in a whitespacedelimited text file. The senatorial voting records for the 109th Congress can be found in voting record dump109.txt. Each line of the file represents the voting record of a different senator. In case you've forgotten how to read in the file, you can do it like this:

>>> f = open('voting_record_dump109.txt')

>>> mylist = list(f)

You can use the split($\cdot$) procedure to split each line of the file into a list; the first element of the list will be the senator's name, the second will be his/her party affiliation (R or D), the third will be his/her home state, and the remaining elements of the list will be that senator's voting record on a collection of bills. A "1" represents a 'yea' vote, a "-1" a 'nay', and a "0" an abstention.

Task 2.12.1: Write a procedure create voting dict(strlist) that, given a list of strings (voting records from the source file), returns a dictionary that maps the last name of a senator to a list of numbers representing that senator's voting record. You will need to use the built-in procedure int($\cdot$) to convert a string representation of an integer (e.g. '1') to the actual integer (e.g. 1).

We would like to determine just how like-minded two given senators are. We will use the dot-product of vectors u and v to judge how often two senators are in agreement.

Task 2.12.2: Write a procedure policy compare(sen a, sen b, voting dict) that, given two names of senators and a dictionary mapping senator names to lists representing voting records, returns the dot-product representing the degree of similarity between two senators' voting policies.

Task 2.12.3: Write a procedure most similar(sen, voting dict) that, given the name of a senator and a dictionary mapping senator names to lists representing voting records, returns the name of the senator whose political mindset is most like the input senator (excluding, of course, the input senator him/herself).

Task 2.12.4: Write a very similar procedure least similar(sen, voting dict) that returns the name of the senator whose voting record agrees the least with the senator whose name is sen.

Task 2.12.5: Use these procedures to figure out which senator is most like Rhode Island legend Lincoln Chafee. Then use these procedures to see who disagrees most with Pennsylvania's Rick Santorum. Give their names.

Task 2.12.6: How similar are the voting records of the two senators from your favorite state?