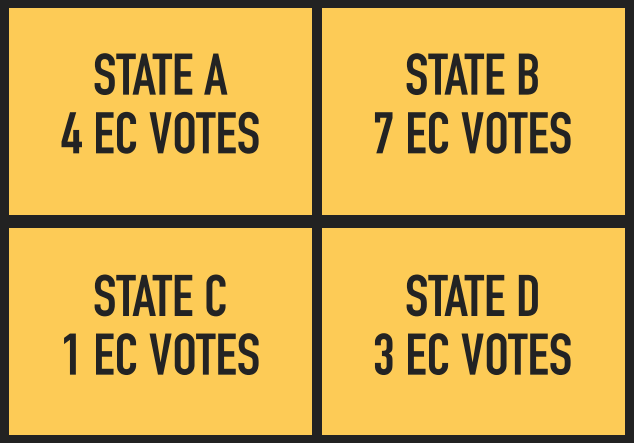
CS103L SPRING 2017

PROGRAMMING MIDTERM

PROBLEM #1: THE ELECTORAL COLLEGE

- US Presidential elections are done by the Electoral College system
- Each state has a number of votes in the Electoral College
- Each state holds a vote, the winner of that "local" vote gets the electoral college votes for that state
- Most Electoral College votes = winner
  - Doesn't always track popular vote (See 4/8/2016)

PROBLEM #1: EXAMPLE ELECTION



- Questions:
  - How many EC total votes? 15
  - How many required to win? 8

PROBLEM #1: EXAMPLE ELECTION

STATE A 4 EC VOTES R = 100, D = 150	STATE B 7 EC VOTES R = 750, D = 500
STATE C 1 EC VOTES R=25, D = 30	STATE D 3 EC VOTES R=250, D=300

- Questions:
  - What was popular vote total? R=1125, D=980
  - Who won the electoral college? R = 7, D = 8 (D wins)
  - Best D state by %? State A 60%
  - Best R state by %? State B 60%

PROGRAMMING MIDTERM: FILES

- 1st file describes the electoral college:
  - State names and votes in the EC
- First line = number of states in the file

PROGRAMMING MIDTERM: FILES

- 2nd file describes an election:
- 1st line is candidate #1 name
- 2nd line is candidate #2 name
- The rest of the lines have the following format:
  - <candidate #1 votes> <candidate #2 votes> <state name>

PROGRAMMING MIDTERM: STATE INFO STRUCT

- We give you a struct to hold the mapping between state name and number of electoral college votes.
- You will use the first file to fill in this information

```
// Stores a state's name and how many
// electoral votes that state has
struct StateElectoralInfo{
  string state;
  int elecVotes;
};
```

PROGRAMMING MIDTERM: EXAMPLE STEPS TO SOLVE

- You can follow these steps as is, or devise your own
  - Open file #1, determine how many states (N) are in the file
  - Allocate an array of N StateElectoralInfo struct objects
  - Read the rest of file 1, filling in the data members of the structs with the data read from the file
  - Complete getStateElecVotes(). This will take your array and a state name and return the number of EC votes for that state
  - Open file #2 and read in the candidate names
  - Loop over the rest of file #2 using getStateElecVotes() to keep track of the electoral college votes earned by each candidate. At the same time keep track of the popular vote total, and the name and % of the best state for each candidate
- Profit!

PROGRAMMING MIDTERM: SKELETON CODE

- The skeleton code includes the struct definition.
- The skeleton code also includes the output code required to pass the auto-checker
- All your code goes in the middle and should fill in the variables with the correct data. If it does, then it will pass the auto checker.

PROGRAMMING MIDTERM: GO!

- More info: http://bits.usc.edu/cs103/prog-mt-pres/
- Good luck!
- +1:30 clock starts now
- If you are in the middle of a row, you must staying until your row clears out. Close your laptop to show you are done, then you may read or do other homework, etc.
- WHEN YOU LEAVE, BE SUPER QUIET!
  - We need to maintain a quiet testing environment until the end.