Chapter 9

The Ultimate College Experience

I consider it completely unimportant who will vote, or how; but what is extraordinarily important is this—who will count the votes, and how.

    – Joseph Stalin

Focus Questions

In this chapter, we'll explore the following questions:

- What is the Electoral College, and how does it work?

- What is the winner-take-all rule, and what are its implications for the Electoral College and U.S. presidential elections?

- Why was the Electoral College created, and why is it still used today?

- Are there any viable alternatives to the Electoral College? If so, what are they?

Warmup 9.1. As you may know, U.S. presidential elections are decided using an institution called the Electoral College. However, suppose for this question that the winner of the 2016 U.S. presidential election was determined using instant runoff based on the popular votes received by each candidate nationwide. These popular vote totals, as reported on the web site of the U.S. Federal Election Commission (`http://www.fec.gov`) are shown in Table 9.1. For convenience, suppose Donald Trump was the second choice of all of the Gary Johnson voters in the election, and Hillary Clinton was the second choice of all of the Jill Stein voters.

Candidate	Popular Votes
Hillary Clinton	65,853,516
Donald Trump	62,984,825
Gary Johnson	4,489,221
Jill Stein	1,457,216
Others	1,884,459

TABLE 9.1. 2016 U.S. presidential election

(a) If the second choice of the "Others" voters had been split as evenly as possible between Clinton and Trump, who would have won this election under instant runoff?

(b) If the second choice of the "Others" voters had been split as closely as possible to 60% for Clinton and 40% for Trump, who would have won this election under instant runoff?

(c) Do you think there is a way to divide the second choice of the "Others" voters between Clinton and Trump so that one these two candidates would have beaten the other in the final round of instant runoff by a single popular vote? If so, can you find that split (either in percentages or actual numbers of voters)?

As we discussed in Chapter 2, the 2016 U.S. presidential election was hotly contested and provoked a staggering amount of controversy in the political world. Even so, at least mathematically, the 2000 U.S. presidential election was even more controversial. Counting and recounting of the popular votes in Florida in 2000 delayed final certification of the results until a full 36 days after the votes were cast, when the U.S. Supreme Court decided by a 5-4 margin to block further recounts, leaving George W. Bush as the winner of the state, and, consequently, the presidency. Bush's certified vote total in Florida was larger than Al Gore's by only 537 out of the almost 6 million total votes that had been cast statewide.

What is more remarkable is that in the 2000 election, Bush was declared the overall winner while receiving more than half a million fewer popular votes than Al Gore nationwide. This bizarre behavior was repeated, and in fact exceeded, in the 2016 election, when Trump was declared the overall winner while receiving almost three million fewer popular votes than Hillary Clinton nationwide. (See Table 9.1.) In this chapter, we'll learn about the system that resulted in these strange outcomes and how it came to be.

The Electoral College

The voting system used by the United States to elect its president is one of the most important examples of its kind, as well as one of the most unusual.

No other country uses such a system to elect its head of state. But arguably the most powerful person on the planet, the President of the United States, is elected using a procedure that effectively operates as a weighted voting system—the famous, and infamous, *Electoral College.*

The Electoral College is really a weighted voting system with a few twists. As mandated in the Constitution, each state casts a number of votes in the Electoral College equal to the number of members of Congress (senators plus representatives) from that state. The only additional votes cast in the Electoral College are three for the District of Columbia (to match the number of electoral votes held by the smallest states). Thus, under the current system, there are 538 electoral votes—435 to represent the members of the House of Representatives, 100 to represent the members of the Senate, and 3 for the District of Columbia.

These 538 electoral votes are actually physically cast by individuals called *electors* who typically meet to vote a few weeks after the November presidential election. Once the votes of these electors are cast, the outcome of the election is determined using majority rule.

Question 9.2.* Consider again the 2016 U.S. presidential election. Suppose that by some amazing twist of fate, Gary Johnson had been able to win the 38 electoral votes from the state of Texas, resulting in the electoral vote totals shown in Table 9.2. Would Johnson's stellar performance in Texas have changed the outcome of the election? If so, how?

Candidate	Electoral Votes
Donald Trump	266
Hillary Clinton	227
Gary Johnson	38
Others	7

TABLE 9.2. A 2016 Electoral College scenario

As you hopefully remembered when you were answering Question 9.2, an election can sometimes result in a tie under majority rule, even when one of the candidates receives more votes than any of the others. Recall that to win an election under majority rule, a candidate must receive *more than half* of the total number of votes. In the Electoral College, this amounts to at least 270 electoral votes, a number you are likely to hear repeated many times during any presidential campaign.

But what if no candidate attains this all-important number of votes? The answer to this question might surprise you. If no candidate receives a majority of the electoral votes, then the electoral (and popular) votes are discarded, and the members of the U.S. House of Representatives vote to determine the winner. This has happened twice throughout U.S. history, in

the presidential elections of 1800 and 1824. As we'll see in the next section, there is a very good reason why it has not happened again since then.

The Winner-Take-All Rule

One of the most controversial aspects of the Electoral College is the *winner-take-all* rule, which specifies that all of the electors from each state (with a couple of exceptions we will discuss soon) will vote in the Electoral College for the candidate who won a plurality of the popular votes cast in that state. It is this general rule that makes the Electoral College effectively operate as a weighted voting system, and it is the plurality method that underlies the winner-take-all rule that reveals the first notable deficiency in the system: it is highly manipulable. In every presidential election, there are many voters who would benefit by casting a vote that misrepresents their true preferences. The next question illustrates this phenomenon.

Question 9.3.[*] Table 9.3 lists the total number of popular votes received in Florida by each of the candidates in the 2000 U.S. presidential election. In addition to these vote totals, assume for this question that the second choice of all of the Browne voters was Gore, and the second choice of the Nader voters was split as closely as possible to 20% for Bush and 80% for Gore.

Candidate	Popular Votes
George W. Bush	2,912,790
Al Gore	2,912,253
Ralph Nader	97,488
Harry Browne	16,415
Others	24,164

Table 9.3. 2000 U.S. presidential election in Florida

(a) Suppose that some of the Browne voters (but none of the Nader voters) had decided to switch their votes to their second choice, Gore. How many such voters would have needed to switch their votes in order to change the outcome of the election in Florida (and, consequently, nationwide)?

(b) Suppose that some of the Nader voters (but none of the Browne voters) had decided to switch their votes to their second choice, either Gore or Bush (with 20% of the switched votes going to Bush and 80% to Gore). How many such voters would have needed to switch their votes in order to change the outcome of the election?

(c) In this election, Gore aligned on major issues much more closely with Browne and Nader than with Bush. Despite this, do you think

Gore's supporters might have been well-served by running negative campaign ads in Florida attacking Browne or Nader? How might the arguments presented in such ads have differed from the arguments presented in ads that directly attacked Bush?

Now back to the winner-take-all rule. As we have described, when you cast a popular vote in a presidential election, you are actually casting a vote for who you want *all* of your state's electors to vote for. This is true as long as you don't live in Maine or Nebraska. In both of these states, a single elector is designated to specifically represent each congressional district (two in Maine, three in Nebraska), with two electors left over. The general rule is that an elector representing a particular congressional district will vote in the Electoral College for the candidate who wins a plurality of the popular votes cast in that district, and the two electors left over will vote for the candidate who wins a plurality of the popular votes cast statewide. These rules were adopted by Maine and Nebraska starting with the 1972 and 1992 presidential elections, respectively, although as of this writing, they have each split their electoral votes only once since then, with Barack Obama winning exactly one of Nebraska's electoral votes in 2008, and Donald Trump winning exactly one of Maine's in 2016.

The constitutionality of the winner-take-all rule has been questioned numerous times over the years. This shouldn't be a surprise though, especially considering that there is no federal law requiring individual electors to follow it. In several instances the rule has even been violated, including in 2016, when no less than 7 of the 538 electors cast a vote for a different candidate than the one to whom they were pledged. Such electors are sometimes called *faithless* electors. And while faithless electors have the potential to alter the outcome of an election (as some were hoping would happen in 2016), they have never actually done so.

Question 9.4. In the 1992 U.S. presidential election, business magnate H. Ross Perot received almost one fifth of the popular votes, but not a single electoral vote. Explain how the winner-take-all rule contributed to this phenomenon. What other factors were involved in Perot's disappointing Electoral College showing?

As suggested by Question 9.4, the winner-take-all rule has some serious consequences, especially with regard to the viability of third-party candidates. In fact, because of the strong two-party political system that developed in the U.S. during the early 1800s, most presidential elections end up being a choice between only two legitimate contenders. This is true even when there are more than two candidates who receive significant percentages of the popular vote.

So what is the Electoral College good for? Perhaps this question is best answered by considering its history.

Some History

The Electoral College was created and exists today because of a compromise reached at the Constitutional Convention in 1787 between a group of politicians who wanted the president to be directly elected by the entire U.S. population and another group who wanted the president to be chosen by Congress. One purpose of the Electoral College was to place the selection of the president in the hands of a body that was chosen to represent the entire population, but removed from Congress, and small enough to make deliberative choices that are possible only among well-informed voters. The winner-take-all approach of the Electoral College developed almost immediately, but only after it became obvious that the American population, though spread out over a very large area that included parts both urban and rural, could be well-informed about the candidates after all.

As you might expect, the Electoral College has evolved over the years, with the most noticeable changes resulting from the addition of states to the Union. Until 1911, when the size of the House of Representatives was fixed by law, the total number of votes in the Electoral College changed with the addition of each new state (and for other reasons that we will discuss in Chapter 11). After 1911, the only changes in the number of electoral votes came in 1959 when Alaska and Hawaii were granted statehood, and in 1961, when the 23rd Amendment to the U.S. Constitution granted the District of Columbia its three electoral votes. Although the total number of electoral votes has remained constant since the 1964 election, their distribution to the states has not. Even though the size of the House of Representatives is currently fixed at 435 members, the number of representatives allocated to each particular state is not fixed. This is why, for example, during the 2004 presidential election, California had 55 electoral votes, instead of the 54 it had during the 2000 election. After the reapportionment of the seats in the House that occurred in 2002 (based on the results of the national census of 2000), California was awarded an additional seat in the House, at the expense of some other state that was forced to give up a seat. In Chapter 11, we will discuss and study the process through which the seats in the House are distributed to the states. For now, however, you may be interested in considering some of the differences in the electoral vote distribution between the 2000 and 2016 elections. For comparison, the numbers of electoral votes held by each state and the District of Columbia in both 2000 and 2016 are shown in Table 9.4.

Question 9.5.[*] By what percentage did the number of electoral votes held by California increase between the 2000 and 2016 presidential elections?

Question 9.6. Which state experienced the largest percentage increase in its number of electoral votes between the 2000 and 2016 presidential elections? Which state experienced the largest percentage decrease?

State	2000 Votes	2016 Votes	State	2000 Votes	2016 Votes	State	2000 Votes	2016 Votes
AL	9	9	KY	8	8	ND	3	3
AK	3	3	LA	9	8	OH	21	18
AZ	8	11	ME	4	4	OK	8	7
AR	6	6	MD	10	10	OR	7	7
CA	54	55	MA	12	11	PA	23	20
CO	8	9	MI	18	16	RI	4	4
CT	8	7	MN	10	10	SC	8	9
DE	3	3	MS	7	6	SD	3	3
DC	3	3	MO	11	10	TN	11	11
FL	25	29	MT	3	3	TX	32	38
GA	13	16	NE	5	5	UT	5	6
HI	4	4	NV	4	6	VT	3	3
ID	4	4	NH	4	4	VA	13	13
IL	22	20	NJ	15	14	WA	11	12
IN	12	11	NM	5	5	WV	5	5
IA	7	6	NY	33	29	WI	11	10
KS	6	6	NC	14	15	WY	3	3

TABLE 9.4. Electoral votes by state

Power in the Electoral College

Another purpose of the Electoral College was to protect the smaller states by giving each state—regardless of population— two electoral votes for their members of the Senate. For example, these two votes gave the least populous state, Wyoming, which in 2016 had only one seat in the House of Representatives, a 200% boost (2/1) in its electoral vote total. But the most populous state, California, which in 2016 had 53 seats in the House, received only a 3.77% boost (2/53). The end result is that in the smaller states, each elector generally represents a smaller number of people.

Question 9.7.[*] Using the U.S. Census Bureau's 2016 population total estimate of 585,501 for Wyoming, find the number of people represented by each of this state's electors in the 2016 presidential election.

Question 9.8.

(a) Using the U.S. Census Bureau's 2016 population total estimate of 39,250,017 for California, find the number of people represented by each of this state's electors in the 2016 presidential election.

(b) Briefly discuss how you feel about the fairness of the Electoral College in light of your answers to Question 9.7 and part (a) of this question.

(c) Using your answers to Question 9.7 and part (a) of this question, explain how you might convince someone that it is better for U.S. presidential candidates to campaign in Wyoming than in California.

Despite your answer to part (c) of Question 9.8, you would probably agree that in reality it is much more beneficial for U.S. presidential candidates to campaign in large states like California than in small states like Wyoming. The winner-take-all rule in the Electoral College means that receiving a majority of the popular votes in Wyoming only guarantees a candidate 3 electoral votes, as opposed to the 55 that would currently be guaranteed in California. This actually makes individual voters in California much *more* powerful in presidential elections than voters in Wyoming.

But there is a lot more to the Electoral College story than just the sizes of the states and the numbers of electoral votes they control. For one thing, we learned in Chapter 8 that a voter's power within a weighted voting system is not always directly proportional to the number of votes they control. As we saw then, power is often more accurately described by measures such as the Banzhaf index or the Shapley-Shubik index, each of which takes into account factors other than simply the number of votes held by each voter. But how would we go about calculating these indices for the Electoral College? The next two questions indicate the amount of work that might be involved in this task.

Question 9.9.*

(a) With 51 voters in the Electoral College (the 50 states plus the District of Columbia), how many different coalitions are possible? Clearly explain your answer. (For this question, you may assume that Maine and Nebraska go along with the winner-take-all rule.)

(b) How long would it take you to form all of the different possible coalitions from part (a) using a computer that could form one million such coalitions per second? Express your answer in years.

Question 9.10.

(a) How many different ways are there to arrange in some order the 51 voters in the Electoral College?

(b) How long would it take you to form all of the different arrangements from part (a) using a computer that could form one million such arrangements per second? Express your answer in years using scientific notation.

As suggested by Questions 9.9 and 9.10, the calculations needed to find the power indices for the states in the Electoral College would require sophisticated mathematical methods and a lot of computing power. While a discussion of how these power indices could be calculated efficiently is beyond the scope of this book, we can take comfort in knowing that the calculations have been done, and their results are readily available.

The Banzhaf indices of each of the states in the Electoral College for the 2016 presidential election are shown in Table 9.5. Note that the percentage of the total Banzhaf power held by each state differs only very slightly from the percentage of the electoral votes controlled by the state, with the only exception being California. The Shapley-Shubik power percentages for the Electoral College (not shown) are similar to the Banzhaf percentages; they indicate a slightly smaller percentage of power for California, but one that is still noticeably higher than the percentage of the electoral votes controlled by the state. If the population of California continues to grow at its current rate, these gaps will continue to increase.

With that said, it's interesting to note that, even with the massive number of electoral votes controlled by California and its high percentage of power in the Electoral College, the state received very little attention from the candidates in the campaign leading up to the 2016 election. This was because early polls indicated that California, which has become a reliably Democratic state, would almost certainly be won by Hillary Clinton. So despite everything we have said about the power held by individual voters in California and the state as a whole, it actually had only a minimal impact on the outcome of the 2016 presidential election. Donald Trump basically conceded the state to Clinton early on, just as Clinton conceded Texas to Trump early on (although Clinton did run some ads in Texas in the late stages of her campaign). Both candidates spent the bulk of their time and money in states that were expected to be close, such as Michigan, Pennsylvania, and Wisconsin, which indeed were all won (by Trump) by a margin of less than 0.8% of the popular votes that were cast in the state.

It's also interesting to note that, even in spite of the apparent advantage enjoyed by larger states in the Electoral College, the winner-take-all rule really does offer some protection for smaller states. For example, consider the final numbers of pledged electoral votes in the 2000 presidential election, which are shown in Table 9.6. Given these numbers, we can see that if Bush had lost Wyoming to Gore in the 2000 presidential election, then Gore would have won the presidency instead of Bush (which, by the way, would have also alleviated the controversy in Florida). So the Electoral College does incentivize campaigning in smaller states, especially in close elections.

States	Electoral Votes	Percentage of Electoral Votes	Percentage of Banzhaf Power
CA	55	10.2%	11.4%
TX	38	7.1%	7.2%
FL, NY	29	5.4%	5.4%
IL, PA	20	3.7%	3.7%
OH	18	3.3%	3.3%
GA, MI	16	3.0%	2.9%
NC	15	2.8%	2.7%
NJ	14	2.6%	2.6%
VA	13	2.4%	2.4%
WA	12	2.2%	2.2%
AZ, IN, MA, TN	11	2.0%	2.0%
MD, MN, MO, WI	10	1.9%	1.8%
AL, CO, SC	9	1.7%	1.6%
KY, LA	8	1.5%	1.5%
CT, OK, OR	7	1.3%	1.3%
AR, IA, KS, MS, NV, UT	6	1.1%	1.1%
NE, NM, WV	5	0.9%	0.9%
HI, ID, ME, NH, RI	4	0.7%	0.7%
AK, DE, DC, MT, ND, SD, VT, WY	3	0.6%	0.6%

TABLE 9.5. 2016 Electoral College Banzhaf power percentages

Candidate	Electoral Votes (Pledged)
George W. Bush	271
Al Gore	267

TABLE 9.6. 2000 U.S. presidential election

Swing Votes and Perverse Outcomes

So far, we've talked about the 2000 U.S. presidential election and how close it was. We've also hinted at the fact that under the Electoral College, how close an election is depends on much more than just the difference in the total number of votes cast for each candidate nationwide. For example, in the 2000 election, if only 538 Harry Browne voters in Florida had switched their votes to Al Gore, then Gore would have won the national election rather than George W. Bush (as you observed in part (a) of Question 9.3). And if it were Bush voters instead of Browne voters switching their votes to Gore, it would only have taken half as many, or 269, to swing the outcome from Bush to Gore. That's 269, or 0.00026%, of the 105,405,100 popular votes that were cast in this election nationwide.

Analyzing the 2016 U.S. presidential election is not quite as simple, since Texas was the only state that could have singlehandedly swung the outcome, and Texas was not particularly competitive. To see how close the 2016 election really was, consider the final numbers of pledged electoral votes, which are shown in Table 9.7, and the total numbers of popular votes cast in each state for both Hillary Clinton and Donald Trump, which are shown in Table 9.8.

Candidate	Electoral Votes (Pledged)
Donald Trump	306
Hillary Clinton	232

TABLE 9.7. 2016 U.S. presidential election

Question 9.11.[*] In the 2016 presidential election in the state of Texas, what was the total difference in the number of popular votes cast for Clinton and Trump? Counting only votes cast for Clinton and Trump in Texas, what was the percentage difference in the number of popular votes cast for these two candidates?

Question 9.12. Which state was the closest between Clinton and Trump in the 2016 presidential election? Does your answer depend on whether you measure the vote difference as an actual number of votes or as a percentage?

Question 9.13.[*] In the 2016 presidential election, what is the smallest number of voters in Texas who could have changed the outcome of the election by changing their votes from Trump to Clinton?

Question 9.14. In the 2016 presidential election, what is the smallest number of voters nationwide (from any state or states) who could have changed the outcome of the election by changing their votes from Trump to Clinton?

State	Clinton Votes	Trump Votes	State	Clinton Votes	Trump Votes
AL	729,547	1,318,255	MT	177,709	279,240
AK	116,454	163,387	NE	284,494	495,961
AZ	1,161,167	1,252,401	NV	539,260	512,058
AR	380.494	684,872	NH	348,526	345,790
CA	8,753,788	4,483,810	NJ	2,148,278	1,601,933
CO	1,338,870	1,202,484	NM	385,234	319,667
CT	897,572	673,215	NY	4,556,124	2,819,534
DE	235,603	185,127	NC	2,189,316	2,362,631
DC	282,830	12,723	ND	93,758	216,794
FL	4,504,975	4,617,886	OH	2,394,164	2,841,005
GA	1,877,963	2,089,104	OK	420,375	949,136
HI	266,891	128,847	OR	1,002,106	782,403
ID	189,765	409,055	PA	2,926,441	2,970,733
IL	3,090,729	2,146,015	RI	252,525	180,543
IN	1,033,126	1,557,286	SC	855,373	1,155,389
IA	653,669	800,983	SD	117,458	227,721
KS	427,005	671,018	TN	870,695	1,522,925
KY	628,854	1,202,971	TX	3,877,868	4,685,047
LA	780,154	1,178,638	UT	310,676	515,231
ME	357,735	335,593	VT	178,573	95,369
MD	1,677,928	943,169	VA	1,981,473	1,769,443
MA	1,995,196	1,090,893	WA	1,742,718	1,221,747
MI	2,268,839	2,279,543	WV	188,794	489,371
MN	1,367,716	1,322,951	WI	1,382,536	1,405,284
MS	485,131	700,714	WY	55,973	174,419
MO	1,071,068	1,594,511			

TABLE 9.8. 2016 U.S. presidential election popular votes by state

As we saw in the last few questions, the Electoral College can be very sensitive to relatively small changes; that is, the potential exists for a relatively small number of swing voters to have a significant impact on the outcome of an election. But how many popular votes must a candidate receive in order to be elected in the first place?

Question 9.15.[*] The U.S. Census Bureau's 2016 citizens of voting age population estimates for each of the fifty states and the District of Columbia are shown in Table 9.9. For convenience, suppose for this exercise that all citizens of voting age (and only citizens of voting age) are eligible to vote.

State	Voting-Age Citizens	State	Voting-Age Citizens	State	Voting-Age Citizens
AL	3,653,381	KY	3,329,835	ND	571,119
AK	528,248	LA	3,454,978	OH	8,765,154
AZ	4,710,448	ME	1,056,410	OK	2,807,548
AR	2,185,724	MD	4,239,987	OR	2,956,232
CA	25,002,812	MA	4,924,459	PA	9,752,322
CO	3,896,986	MI	7,436,478	RI	784,997
CT	2,584,884	MN	4,007,159	SC	3,677,799
DE	697,148	MS	2,220,616	SD	634,140
DC	504,242	MO	4,567,771	TN	4,919,574
FL	14,441,877	MT	797,198	TX	17,523,904
GA	7,168,068	NE	1,352,947	UT	1,945,001
HI	1,022,704	NV	1,942,764	VT	494,717
ID	1,168,843	NH	1,035,684	VA	6,062,304
IL	9,017,653	NJ	6,154,126	WA	5,081,800
IN	4,856,797	NM	1,470,045	WV	1,451,557
IA	2,310,467	NY	13,704,991	WI	4,340,567
KS	2,074,102	NC	7,296,335	WY	434,584

TABLE 9.9. 2016 citizens of voting age population estimates by state

(a) Construct a scenario in which Donald Trump could have won the 2016 presidential election while receiving only 11 popular votes nationwide.

(b) In the scenario you came up with for part (a), how many votes could Hillary Clinton have received and still have lost to Trump? In this case, what percentage of the popular votes cast would Trump have received? What percentage of the popular votes cast would Clinton have received? (Note: The sum of all 51 of the population estimates in Table 9.9 is 227,019,486.)

(c) What assumptions did you have to make in order to construct the example you gave for parts (a) and (b)? Were these assumptions reasonable? Why or why not?

Question 9.15 demonstrates that under the Electoral College, it is possible, albeit absurdly improbable, for a candidate to win the presidency while receiving only a ridiculously small number and percentage of the popular votes cast in the election. Of course, to construct such a perverse example,

one must make several assumptions that are completely unreasonable for an actual election. So let's consider what would happen if we attempted to make some of our assumptions a bit more realistic.

One starting point would be to assume that voter turnout is roughly the same from state to state. Although this assumption is not entirely accurate, it does rule out the possibility of strange scenarios in which only one person shows up to vote in certain states and all citizens of voting age show up to vote in other states. (You probably used such a scenario in your answer to Question 9.15.) Incidentally, the ratio of popular votes cast to citizens of voting age in the 2016 U.S. presidential election was 60.2%. (In 2012, this ratio was 58.6%.)

Question 9.16. Consider again the 2016 U.S. presidential election.

    (a) Assuming that the voter turnout in each state and the District of Columbia was exactly 60.2% of citizens of voting age, and that each voter cast a vote for either Hillary Clinton or Donald Trump, construct a scenario in which Donald Trump could have won the election while receiving less than 25% of the nationwide popular vote. (Recall that the sum of all 51 of the population estimates in Table 9.9 is 227,019,486.)

    (b) In your answer to part (a), which states did you assume Trump would win? What made you choose those states?

    (c) If you wanted to construct a winning coalition of states for Trump that contained the smallest possible number of popular votes, should you include more larger states or more smaller states? Give a convincing argument to justify your answer.

    (d) What assumptions did you have to make in order to construct your scenario for part (a)? Were all of these assumptions reasonable? Why or why not?

The scenario you constructed for Question 9.16 was perhaps somewhat more realistic than the one you came up with for Question 9.15, but you probably still made some assumptions that were not entirely reasonable. For instance, you may have assumed that in certain states, the entire population voted the same way. You may have also assumed that the vote was split almost exactly evenly in other states.

For the next question, we'll try to work entirely within the context of the real world by making only assumptions that we could reasonably expect to be true for all U.S. presidential elections. Of course, in doing so, we'll be stepping into a bit of a gray area, since we'll have to make some personal judgments about what could and could not reasonably occur in an actual election. Some of this is a matter of opinion, and so our task will be twofold. First, we'll have to come up with good arguments to make the case that our

assumptions are reasonable. Then, we'll have to use good reasoning to come up with a defensible, worst-case scenario based on these assumptions.

Question 9.17. Complete the following statement:

> *In an actual U.S. presidential election with only two candidates, it would be virtually impossible for a candidate to win the election without receiving at least ____ % of the popular votes.*

Give a convincing argument to justify your answer, describing in detail the assumptions you made, why these assumptions are reasonable, and why your answer follows from them.

Alternatives to the Electoral College

We'll conclude this chapter by briefly considering a few of the alternative methods that have been proposed to replace the Electoral College system. The list below is by no means exhaustive, but it does give a sense of some of the recent debate surrounding the Electoral College. Also note that some of the alternatives listed would be easier to implement than others. For example, any proposal to completely abolish the Electoral College would require an amendment to the U.S. Constitution; proposals that would only involve changing the way states allocate their electoral votes would not require such an amendment.

Alternative Method 1 – Plurality. The plurality winner of the nationwide popular vote could just be declared the winner. (This would have made Hillary Clinton supporters very happy in 2016.)

Alternative Method 2 – District System. The method currently used to award electoral votes in Maine and Nebraska could be used nationwide. Under this method, the winner-take-all rule would hold in the District of Columbia and states that have only a single congressional district, but larger states would be able to split their electoral votes among the different candidates.

Alternative Method 3 – Proportional System. States could choose to allocate their electoral votes proportionally, so that, for example, a candidate who received 27.32% of the popular votes cast in a state would receive 27.32% of the state's electoral votes. This would necessitate the use of fractional electoral votes—or, alternatively, states could choose to round the number of electoral votes awarded to the nearest whole number. (We'll see in Chapter 11 that this latter option is not quite as straightforward as it may seem.) Legislators in several states have proposed bills to implement a proportional system, but most of these bills have failed to gain any significant traction.

Alternative Method 4 – Approval Voting. Approval voting could be used, either as an outright replacement to the Electoral College, or as an alternative to plurality in deciding the winner of each state. Approval voting would be a relatively simple way to allow voters to better express their preferences in races that involve more than two candidates.

Question 9.18. If the proportional system (Alternative Method 3 above) had been used in the 2000 U.S. presidential election, how many electoral votes would have been awarded to George W. Bush in Florida?

Question 9.19. Could a candidate win a U.S. presidential election under Alternative Method 1 but lose the same election under Alternative Method 3? What about vice versa? Give a convincing argument to justify each of your answers.

Question 9.20. Briefly discuss any positive or negative features that you can identify in each of the four alternative methods described above. Which of these methods do you think is the best alternative to the Electoral College? Do you think the Electoral College should be replaced by one of these methods? Why or why not?

Question 9.21. Find or invent another alternative method to the Electoral College, and discuss any positive or negative features of this method. Do you think the Electoral College should be replaced by your method? Why or why not?

Question 9.22. Based on what you have learned in this chapter, give an honest assessment of the Electoral College from your own point of view. Do you think it's a good system? Should we continue to use it? Why or why not? If you were a presidential candidate, which would you prefer to be used to declare the winner of your election: plurality or the Electoral College? How would you campaign differently if plurality were used instead of the Electoral College?

Questions for Further Study

Question 9.23. Decide which of the criteria we discussed for evaluating voting systems in Chapters 2–5 can be applied to the Electoral College. Then decide, if possible, which of the applicable criteria the Electoral College satisfies and which it violates. Explain your answers in detail, and give convincing arguments to justify your claims.

Question 9.24. Describe a scenario (using actual state names and electoral vote totals) in which a single faithless elector could change the outcome of a U.S. presidential election.

Question 9.25. The final electoral vote tally from the 2016 U.S. presidential election was 304 votes for Donald Trump, and 227 for Hillary Clinton, with

7 faithless electors (2 of which were pledged to Trump and 5 to Clinton) who voted for other people.

(a) Find and write a description of who the faithless electors voted for.

(b) Discuss whether you think it is ever acceptable for an elector to vote in the Electoral College for someone other than the candidate to whom they are pledged.

(c) In Trump's winning coalition of states (the collection of states that he won), figure out which of the states were critical according to how we defined this term in Definition 8.2.

(d) If Texas had been won by Clinton instead of Trump, and if the faithless electors pledged to Clinton had voted for Clinton in the Electoral College, which states would have been critical in Clinton's winning coalition of states?

Question 9.26. The final electoral vote tally from the 2004 U.S. presidential election was 286 votes for George W. Bush, and 251 for John Kerry, with 1 faithless elector pledged to Kerry who voted for someone else.

(a) Find and write a description of why the faithless elector voted for someone else.

(b) In Bush's winning coalition of states (the collection of states that he won), figure out which of the states were critical according to how we defined this term in Definition 8.2.

(c) In this election, by how many votes did Bush win the state of Ohio? How many Bush voters would have needed to switch their votes from Bush to Kerry in order to change the outcome of the election in Ohio?

(d) Suppose that exactly the number of voters you specified in part (c) had switched their votes from Bush to Kerry. In this scenario, who would have won the national election?

(e) In the situation described in part (d), what percentage of the nationwide popular vote would Bush have received? What percentage would Kerry have received?

(f) Does anything about your answers to parts (d) and (e) strike you as being strange or unusual? (Hint: Think back to 1876.)

Question 9.27. The final electoral vote tally from the 2000 U.S. presidential election was 271 votes for George W. Bush, and 266 for Al Gore, with 1 faithless elector pledged to Gore who abstained from voting.

(a) Find and write a description of why the faithless elector abstained from voting. Then discuss whether you agree or disagree with the elector's point of protest.

(b) Discuss whether you think it is ever acceptable for an elector to abstain from voting in the Electoral College.

(c) In Bush's winning coalition of states (the collection of states that he won), figure out which of the states were critical according to how we defined this term in Definition 8.2.

(d) If Florida had been won by Gore instead of Bush, and if the faithless elector had voted for Gore in the Electoral College, which states would have been critical in Gore's winning coalition of states?

Question 9.28. Research the last three times, prior to 2000, that an elector was faithless. Write a detailed summary of your findings.

Question 9.29. Find and write a summary of each U.S. presidential election in which the Electoral College winner did not receive a plurality of the nationwide popular vote.

Question 9.30. Has there ever been a U.S. presidential election with a unanimous Electoral College winner? If so, what percentage of the nationwide popular vote did the winning candidate receive? If not, which U.S. president came the closest to being a unanimous Electoral College winner?

Question 9.31. In your opinion, which of the following U.S. presidential elections was closest: 2000, 1960, or 1880? Explain why you think so, and then give a reason why it could also be argued that each of the other two were actually closer.

Question 9.32. Write a complete summary of how the U.S. presidential election of 1800 concluded despite the fact that there was no majority winner in the Electoral College. Include in your summary a description of how Aaron Burr later exacted his revenge on Alexander Hamilton.

Question 9.33. Write a complete summary of how the U.S. presidential election of 1824 concluded despite the fact that there was no majority winner in the Electoral College. Include in your summary a description of the "corrupt bargain."

Question 9.34.

(a) In a presidential election with exactly two candidates, would it be possible for a candidate to win unanimously in the Electoral College without receiving a plurality of the nationwide popular vote? Give a convincing argument or example to justify your answer.

(b) In a presidential election with more than two candidates, would it be possible for a candidate to win unanimously in the Electoral College without receiving a plurality of the nationwide popular vote? Give a convincing argument or example to justify your answer.

Question 9.35. Find a copy of Article 2, Section 1 of the U.S. Constitution, and write a summary of what it states. Then critique this section of the

Constitution by identifying any deficiencies present in its description of how the Electoral College should operate.

Question 9.36. Find a copy of the 12th Amendment to the U.S. Constitution, and write a summary of what it states. Then append to your summary a complete description of the historical event that caused the amendment to be written and ratified in the first place.

Question 9.37. Suppose that in the 2016 U.S. presidential election, every popular voter in your state voted for either Hillary Clinton or Donald Trump. If, upon the initial counting of the votes, it was discovered that one candidate had defeated the other by the smallest margin possible (either 1 or 2 votes, depending on if there were an even or odd number of voters), would a recount of the votes cast in your state have been required? If so, find out the procedures that would have governed the recount, and write a summary of your findings. Include in your summary exactly how close the initial vote counts would have needed to be in order for a recount to be necessary.

Question 9.38. Find an article in a popular media source that expresses a positive view of the Electoral College. Write a summary and critique of the article based on what you learned in this chapter.

Question 9.39. Find an article in a popular media source that expresses a negative view or questions the constitutionality of the Electoral College. Write a summary and critique of the article based on what you learned in this chapter.

Question 9.40. Find a statement of the Median Voter Theorem, and write a summary of what it says. Does the Median Voter Theorem accurately reflect the way candidates campaign in U.S. presidential elections? Give a convincing argument to justify your answer.

Question 9.41. In the 2000 U.S. presidential election, some Nader supporters—who thought that their votes for Nader might hurt Gore's overall chances in the election—considered swapping their votes with the votes of Gore supporters from other states. More specifically, Nader supporters in close states (states in which a vote for Nader could have swung the outcome of the election) proposed voting instead for Gore, as long as a Gore voter in a less competitive state cast their ballot for Nader. This would have left the popular vote totals for the two candidates essentially unchanged, thereby giving Nader the publicity he had earned while also increasing Gore's chances of winning in the close states he might have otherwise lost. Do you think this is a sensible way of dealing with some of the problems created by the Electoral College? Why or why not?

Question 9.42. Based on the Banzhaf power percentages in Table 9.5, one could argue that there is a bias in the Electoral College toward larger states. In light of such an argument, how would you explain the fact that some of the strongest advocates of the Electoral College come from smaller states?

Answers to Starred Questions

9.2. Johnson's win in Texas *might* have changed the outcome. Since no candidate would have received a majority of the 538 electoral votes, the Electoral College would have resulted in a tie, with no winner determined.

9.3. (a) If Gore had received 538 additional votes in Florida, then he would have beaten Bush in Florida by a single vote. Thus, only 538 Browne voters would have needed to switch their votes to Gore in order to change the outcome of the election.

9.5. The electoral votes held by California increased by $\frac{1}{54} = 1.85\%$.

9.7. Each elector represented $\frac{585,501}{3} = 195,167$ people.

9.9. (a) There are a total of $2^{51} = 2{,}251{,}799{,}813{,}685{,}248$ different coalitions. (Now explain why this is true.)

9.11. The total difference was $4{,}685{,}047 - 3{,}877{,}868 = 807{,}179$, and the percentage difference was $\frac{807{,}179}{4{,}685{,}047+3{,}877{,}868} = 9.43\%$.

9.13. If 403,590 of the Trump voters in Texas had changed their votes to Clinton, then Clinton would have received 4,281,458 votes in Texas, while Trump would have only received 4,281,457.

9.15. Suppose that only one person voted in each of the 11 largest states, while all citizens of voting age voted in each of the other states. Under these circumstances, Trump could have won with only 0.00001092% of the popular votes.