Name	Provide File Name Prompt
ID	UC_001
Description	System will prompt the user for the name of their election input file.
Actors	The system and the user.
Organizational Benefits	Simplifies the system process in finding the election file in the current directory right away. Makes the process quicker for the future system operations, and allows the system to determine voting type quicker.
Frequency of Use	Once at the beginning of every system run
Triggers	User opens the terminal to run the system.
Preconditions	● The user has a device that runs Java. ● The computer successfully opens the terminal and the user has an election file in CSV format that contains the specified data. (Reference SRS Appendix A - CSV File). ● The CSV they specify is in the current directory. ● Only ASCII characters are in the name.
Postconditions	The system has successfully retrieved user input for the name of the current CSV election file.
Main Course	1. The user successfully opens the terminal. 2. The system commences running. 3. Command prompt welcomes the user and asks for the name of the current CSV election file. (Reference SRS Document section 3.1 user interface) 4. User enters file name on prompt. If no file name is entered see EX1. 5. System verifies with the user that the name of the file is correct. If the name is incorrect, see AC1. 6. If the name is correct, the system verifies that the specified file is in the current directory, see AC2. 7. If the name is correct, the system stores the file name and continues to the next process. Otherwise return to Main Course step 3 and repeat until successful.
Alternate Courses	AC1 The user specifies that they have entered the wrong file name 1. The system prints an error message and informs the user they will be prompted again. 2. The system returns to Main Course 3 to prompt the user again. AC2 The file name that the user entered is not in the current directory 1. System informs the user that the file they named is not in the current directory. Informs them to double check it is in the current

	directory. 2. Return to Main Course step 3.
Exceptions	EX1 The user does not enter a file name 1. The system prints an ERROR message to the user. 2. The system provides the user an option to restart the system or quit. 3. If restart, return to Main Course step 3, otherwise the program terminates.

Name	Read in a CSV File
ID	UC_002
Description	The System reads in the file that the user gave the name to. The system then stores the file information in our program.
Actors	The System
Organizational Benefits	The file will be read so it is prepared for the program. System will be able to access the necessary file information.
Frequency of Use	This will occur once per system run.
Triggers	The user enters a file name in Provide File Name Prompt (UC_001) successfully.
Preconditions	● The user enters a file name, approves the file name, and the specified file is in the current directory. ● File is CSV in specified format (IR or OPL) and contains required information.
Postconditions	The system has read in the file and stored it in the system and the information is now prepared to be processed and analyzed.
Main Course	1. The system informs the user that it will now read in the file. 2. The system opens the file, if not successful, see EX1 3. The system reads the file to prepare data for use, if not successful, see EX2. 4. The information read in from the file is stored in the program. 5. The system informs the user that the file has been read in.
Alternate Courses	None Exist.
Exceptions	EX1 System Fails to Open the File 1. System notifies the user that an error has occurred and the file cannot be opened, with an ERROR message.

	2. System provides the user the option to try again or quit. 3. If restart, return to Main Course Step 1, otherwise terminate the program. EX2 The system fails to read in the file 1. System notifies the user that an error has occurred and the file cannot be read in, with an ERROR message. 2. System provides the user the option to try again or quit. 3. If restart, return to Main Course Step 1, otherwise terminate the program.

Name	Prompt User for Audit File Name
ID	UC_003
Description	The system will prompt the user for the preferred name of the audit file. If no name is preferred a default name will be generated. If a file with the same name already exists, it will be rewritten to contain data from the most recent election run.
Actors	The system, the computer terminal, and the user
Organizational Benefits	This allows the user to control what they want to name the audit report. It will make it easier for the user to keep track of the election files and know what to look for when the system is done running.
Frequency of Use	This will occur once per system run.
Triggers	The system has successfully read in a CSV file.
Preconditions	● The program was loaded and a CSV file was successfully read in. ● Only ASCII characters can be typed into the computer terminal.
Postconditions	The system stores the user input or system generated name.
Main Course	1. The program prompts the user for their preferred audit file name. (Reference SRS Document section 3.1). 2. The user types in the preferred name and presses enter. If the user only presses enter, see AC1. 3. The program confirms with the user the input was correct. If the user indicates they typed in the wrong name, see AC2. 4. The file name is stored for later use. 5. The program prints a confirmation message and continues with the next task
Alternate Courses	AC1 User does not enter an audit file name 1. The saved name of the input CSV file combined with "_audit.txt" will become the default audit file name. a. Example: CSVFileName_audit.txt

	2. Return to main course step 4. AC2 The user specifies that they have entered the wrong file name 1. The system prints a message stating the use will be prompted for the file name. 2. The system returns to Main course step 1 to prompt the user again.
Exceptions	None Exist.

Name	Prompt User for Media File Name
ID	UC_004
Description	The system will prompt the user for the preferred name of the media file. If no name is preferred a unique default name will be generated. If a file with the same name already exists, it will be rewritten to contain data from the most recent election run.
Actors	The system and the user
Organizational Benefits	This allows the user to control what they want to name their reports. It will make it easier for the user to keep track of the election files and know what to look for when the analysis is done.
Frequency of Use	This will occur once per system run.
Triggers	The preferred audit file name was generated.
Preconditions	● The audit file name was successfully generated (UC_003) ● Only ASCII characters can be typed into the computer terminal.
Postconditions	The system stores the user input or system generated name.
Main Course	1. The program prompts the user for their preferred media file name. (Reference SRS Document section 3.1). 2. The user types in the preferred name and presses enter. If the user only presses enter, see AC1. 3. The program confirms with the user the input was correct. If the user indicates they typed in the wrong name, see AC2. 4. The file name is stored for later use. 5. The program prints a confirmation message and continues with the next task
Alternate Courses	AC1 User does not enter an media file name 3. The saved name of the input CSV file combined with "_media.txt" will become the default media file name. a. Example: CSVFileName_media.txt 4. Return to main course step 4. AC2 The user specifies that they have entered the wrong file name 3. The system prints a message stating the use will be prompted for

	the file name. 4. The system returns to main course step 1 to prompt the user again.
Exceptions	None Exist.

Name	Determine Voting Type
ID	UC_005
Description	System will determine the type of election by the first line of the file.
Actors	The System
Organizational Benefits	Simplifies the user input as the system finds it in the file. Simplifies the election process as it allows for one system to handle 2 different types of elections.
Frequency of Use	This will occur once per system run.
Triggers	The preferred media file name was generated.
Preconditions	● The system has access to the file and the file has been opened. ● The file is in the predetermined format and has no mistakes.
Postconditions	The type of election (OPL or IR) is now known by the system.
Main Course	1. The first line of the CSV file was read in. 2. The system determines if the first line is either “IR” or “OPL”. 3. The system stores this value to later determine which voting algorithm to run.
Alternate Courses	None Exist.
Exceptions	None Exist.

Name	Open Party Listing: Grouping Independents
ID	UC_006
Description	For Open Party List voting, all independents are to be grouped into one party.
Actors	The System
Organizational Benefits	Simplifies the algorithm for Open Party Listing.

Frequency of Use	Each Open Party List election.
Triggers	The election is determined to be an OPL election.
Preconditions	● The election was determined to be OPL. ● The file is in the predetermined format and has no mistakes.
Postconditions	All independents are grouped into one party.
Main Course	1. The system reads in the second line of the file, containing the number of candidates. 2. The system uses this number to read in the third line of the file with the format: [candidate, party] with each candidate separated by commas. 3. The system groups each candidate with an "'I" as their party (independent) into the same political group for analysis. If none exist, see EX1. If only one exists, see AC1.
Alternate Courses	AC1 There is only one independent 1. The system puts the one candidate into their own party for analysis.
Exceptions	EX1 There are no independents 1. The system does not make a separate political group for the independents.

Name	Determine Winner for Tie
ID	UC_007
Description	While running either algorithm, if there is a tie between two or more candidates, the system will simulate a fair coin toss to determine the winner.
Actors	The System
Organizational Benefits	This ensures that ties are dealt with in a fair way, and that there is an equal chance for all candidates in the tie to be chosen.
Frequency of Use	Infrequent - it is a special case that may occur during the analysis.
Triggers	For both IR and OPL, the system determines that there is an equal number of votes between two or more of the highest or lowest vote counts.
Preconditions	● None
Postconditions	A winner is determined and the system can move onto the next step in the

	algorithm
Main Course	1. System determines that a tie needs to be broken. 2. Numbers (ex: 0 and 1) are assigned to the candidates. 3. A coin toss is simulated using a pseudo random number generator 1000 times. 4. The result is taken from the 1001th coin toss. 5. The candidate assigned to the number matching the result from step 4 is declared the winner. If another tie occurs, see AC1.
Alternate Courses	AC1 Tie Between 2+ Candidates 1. Using the winner of the last toss and the next candidate in the tie, the system will proceed to Main Course 2.
Exceptions	None Exist.

Name	No Majority in Instant Runoff Election
ID	UC_008
Description	During the Instant Runoff algorithm, if there is no clear majority the candidate with the highest number of votes is the winner.
Actors	The System
Organizational Benefits	This ensures that the general population's votes are still considered when no candidate has a majority.
Frequency of Use	Infrequent - it is a special case that may occur only during an Instant Runoff election.
Triggers	The system determined that no candidate did not secure a majority (>50%) of the votes.
Preconditions	● The system is running an Instant Runoff election.
Postconditions	The candidate with the highest percentage of votes is chosen.
Main Course	1. System determines that there is no candidate with a majority of votes. 2. System will compare the number of votes received by each candidate. 3. The candidate with the highest number of votes is chosen. If there is a tie see AC1.
Alternate Courses	AC1: Tie for highest number of votes 1. System will follow use case UC_007 to break the tie 2. System can then proceed to Main Course 4 with chosen winner
Exceptions	None Exist.

Name	Write an Audit File
ID	UC_009
Description	System will produce an audit file containing the basic election data, election results, unique ballot IDs, and a breakdown of how the ballots were distributed at each step of the analysis.
Actors	The System
Organizational Benefits	The file will contain the process that the algorithm used to calculate the election results. It will also have more detail than any other output of the program. This allows the results to be verified by anyone who has access to the file.
Frequency of Use	This will occur once per system run.
Triggers	All user input is valid and the program begins analysis.
Preconditions	● The system is successfully loaded and begins. ● An audit file name was input by the user or a unique name was generated by the program. ● There is no error in the input CSV file.
Postconditions	An audit .txt file will be created in the same directory as the program. It will have a name given by the user or a name generated by the program (UC_003).
Main Course	1. A new file is created with the correct name. 2. The type of voting system, number of candidates, and number of ballots are written to the file. 3. If Open Party Listing go to alternate course AC1. Write to the file the name of candidates. 4. Unique ballots IDs are given and written to the file. 5. Write to the file which ballots (using the Ids) are allocated to each candidate. If a tie occurs refer to AC2. 6. Repeat steps 4 & 5 until the winning candidate(s) are decided. 7. Write to the file who the winning candidates(s) are and the percent of votes each candidate received. 8. Close the file.
Alternate Courses	AC1 Open Party Listing 1. Write the name of each candidate and what party they are listed under to the file. 2. Return to main course step 5. AC2 A Tie Occurs 1. Write to the file which candidates tied, how many votes, and the outcome of the coin flip, see UC_007. 2. Return to main course step 6.

Exceptions	None Exist.

Name	Write a Media File
ID	UC_010
Description	System will produce a media file containing the winner(s) of the election, the candidates and what percentage of votes went to each candidate.
Actors	The System
Organizational Benefits	This allows a quick and easy way to share election results with media personnel without sharing sensitive or confidential information.
Frequency of Use	This will occur once per system run.
Triggers	All user input is valid and the program begins analysis.
Preconditions	● The system begins and successfully loads in a CSV file. ● A media file name was input by the user or a unique name was generated by the program. ● There is no error in the input CSV file.
Postconditions	An media .txt file will be created in the same directory as the program. It will have a name given by the user or a name generated by the program (UC_004).
Main Course	1. A new file is created with the correct name. 2. The type of voting system and number of candidates is written to the file. 3. If the election is Open Party Listing go to alternate course AC1, 4. Write to the file the name of candidates. 5. Write to the file who the winning candidates(s) are and the percent of votes each candidate received. 6. Close the file.
Alternate Courses	AC1 Open Party Listing 1. Write the name of each candidate and what party they are listed under to the file 2. Return to main course step 6
Exceptions	None Exist.

Name	Display Election Results
ID	UC_011
Description	System will immediately display election results and basic election

	information to the device screen once the program has completed.
Actors	The System and the Computer Terminal
Organizational Benefits	The results will be printed to the computer terminal instantly for the user to view.
Frequency of Use	This will occur once per system run.
Triggers	The input CSV file data is successfully read into the algorithm and the winner(s) are determined.
Preconditions	● The device being used has a working computer terminal. ● The voting system completes successfully.
Postconditions	The election winner(s), number of candidates, candidate names, number of seats, the winner(s), and percent of votes received by each winner is printed to the device terminal screen.
Main Course	1. The voting algorithm is completed successfully. 2. Print to the screen the type of election. 3. Print to the screen the number of candidates. 4. Print to the screen the candidates names. 5. Print to the screen the number of seats. 6. Print to the screen the number of ballots cast. 7. Print to the screen the winner(s). 8. Print the number of votes and the percentage of votes cast for each winner. 9. Print to the screen a goodbye message.
Alternate Courses	None Exist.
Exceptions	None Exist.