

UI/STARTING PROGRAM

Name	Start the Ballot Counting System (BCS)
ID	BCS_ 01
Description	Starting up the ballot counting system
Actors	Election official, testers
Organizational Benefits	Allows election officials and testers to use the Ballot Counting System
Frequency of use	This program will be run multiple times during the year at normal election times and special elections.
Triggers	The user runs the program in a command line interface on a computer with java installed.
Preconditions	Must have the system downloaded onto their computer.
Postconditions	The user has run the program and received results for the election they wanted to process. They are then prompted to enter in another file if they would like.
Main Course	<ol style="list-style-type: none">1. The user first opens a command line interface and navigates to the program location.2. The user runs the program and is prompted to enter in a file name.3. The system then prompts the user to enter in another file
Alternate Course	AC1: If the user finishes running the program they can run the program again on a different file.
Exceptions	Exp 1: The user inputs an invalid filename so the system displays an error message to the user and reprompts them for a valid filename.

READ IN THE BALLOT INFO FILE

Name	Obtain File
ID	BCS_02
Description	To be able to generate the result, the system requires the election file from the user to be in the same directory as the system.
Actors	Election officials, testers
Organizational Benefits	This will allow the system to read in the file and process the information to produce results as well as the audit file and press release file.
Frequency of use	This program will be run multiple times during the year at normal election times and special elections.
Triggers	File is in the same directory as the system
Preconditions	Must have the system downloaded on their computer and must have the file in the same directory as the system. File must have election information
Postconditions	The file information has been obtained by the system.
Main Course	<ol style="list-style-type: none"> 1. The user must make sure the file is in the same directory as the program. 2. When the user is prompted by the system for a filename, the user must enter in the correct filename for the system to be able to find the file. 3. When the filename is entered correctly, the system then reads in the information from the given file.
Alternate Course	There are no alternative courses
Exceptions	<p>Exp 1: The user inputs an invalid filename so the system displays an error message to the user and reprompts them for a valid filename.</p> <p>Exp 2: The user did not put the file in the directory with the system so the system displays an error message and prompts the user for a valid filename.</p>

INSTANT RUNOFF

Name	Process instant runoff ballot
ID	BCS_03
Description	Determine the winner of an instant runoff election
Actors	Election officials, testers
Organizational Benefits	Retrieval of an audit that details what happened in the election. Results can then be shared with the media.
Frequency of use	This program will be run multiple times during the year at normal election times and special elections.
Triggers	The user provides a CSV file whose first line indicates an Instant Runoff election.
Preconditions	Having the ballot information in the form of a CSV file.
Postconditions	Produced an audit file that depicts the type of voting, how many candidates were running, names and parties of each candidate, number of seats, number of ballots, history of how the election progressed (this includes how votes were redistributed, which candidates were eliminated, outcome of the coin toss if there is one, and the winner).
Main Course	<p>During election day, the user (election official) retrieves the ballots from the voters. The user then puts ballots into the system.</p> <p>Accuvote ballot (the system) ranks the candidates based off of preference from each voter. If the candidate is 1, then it is most preferred. If it is 4, then it is least preferred. If a candidate receives over 50% of the first choice vote, the system declares they are declared the winner. The defeated candidates are then transferred by their rank of popularity.</p>
Alternate Course	On ties, a coin flip will determine the winner.
Exceptions	There are no exceptions possible at this point

OPEN PARTY LIST BALLOT

Name	Process open party list ballot
ID	BCS_04
Description	Determine the winner of an open party list election
Actors	Election officials, testers
Organizational Benefits	Retrieval of an audit that details what happened in the election. Results can then be shared with the media.
Frequency of use	This program will be run multiple times during the year at normal election times and special elections.
Triggers	The user provides a CSV file whose first line indicates an Open Party List.
Preconditions	Having the ballot information in the form of a CSV file.
Postconditions	Produced an audit file that depicts the type of voting, how many candidates were running, names and parties of each candidate, number of seats, number of ballots, history of how the election progressed (this includes which candidates were eliminated, if there was a tie; it would depict the outcome of the coin toss, and the winner).
Main Course	<ol style="list-style-type: none"> 1. During election day, the user (election official) retrieves the ballots from the voters. 2. All independent candidates are placed in a single party (independent) for the following 3. To allocate the number of seats to the parties, the quota is calculated by dividing the total number of valid votes in the district by the number of seats. 4. The quota is then divided into the votes that each party received and the party wins one seat for each whole number produced. 5. After the first allocation seat is complete, remainder numbers for parties are compared and the parties with the largest remainders are allocated the remaining seats. 6. For each party with a seat left to assign, the candidate with the most votes (who hasn't been given a seat yet) is given the seat

	a. This repeats until all seats are assigned
Alternate Course	On ties, a coin flip will determine the winner.
Exceptions	There are no exceptions possible at this point

COIN FLIP

Name	Break ties between candidates
ID	BCS_05
Description	Declare winner or loser by coin toss if there is tie
Actors	The system
Organizational Benefits	Decides who's the winner if there is a tie on vote count
Frequency of use	Everytime there is a tie in the vote count.
Triggers	If the vote count between two or more candidates is equal.
Preconditions	Vote count between candidates must be equal.
Postconditions	Whoever wins the coin toss(es) will be declared winner.
Main Course	<p>After the result is processed.</p> <ol style="list-style-type: none"> 1. Select the candidates who received an equal number of votes. 2. Determine whether we need to <ol style="list-style-type: none"> i. Select a winner or ii. There is no majority for an Instant Runoff election and there is a tie between the candidates with the lowest amount of votes 3. Flip the coin and determine the winner from selected candidates, or loser in the loser selection case.

Alternate Course	<p>AC 1 Count votes to see if there is a tie between candidates .</p> <p>1. If there is a tie between more than two candidates, at first two candidates will do coin flip and whoever wins will again do the coin flip with another candidate and repeat until there is only one winner.</p>
Exceptions	No exceptions

GENERATE AUDIT FILE

Name	Create audit file
ID	BCS_06
Description	Create a file that keeps track of all the procedures followed by the system and other related information
Actors	The system
Organizational Benefits	Provide proof that validates the accuracy of the election and the system itself.
Frequency of use	Every time when there is an election and system is used to determine the results.
Triggers	Results are generated by the system without any error.
Preconditions	System ran without any error and has determined a winner.
Postconditions	File is generated that has all the election information including the name of the winner, number of candidates who participated, and calculation done by the system to determine the winner, total number of votes each candidate received and more.
Main Course	<p>After system successfully compute the election result</p> <p>1. Creates a file named " [Election type_currentDate_currentTime]AuditFile " and writes how the calculations were done to determine the winner. System also writes all the details about the election that</p>

	<p>includes: type of voting, number of candidates, number of ballots and number of votes each candidate received. It also records time when the calculations were done.</p> <ol style="list-style-type: none"> 2. System then saves the file in the same folder where it's running from. 3. Indicates users if the file is created and saved in the system successfully.
Alternate Course	No audit file is created if the program is ended prematurely before the file generation is complete.
Exceptions	No exceptions

DISPLAY RESULTS

Name	Display the result of election
ID	BCS _ 07
Description	After all the votes have been counted and the winners have been declared, the results of the election are displayed.
Actors	The System
Organizational Benefits	Allows the user(s) to see the summary and results of the election they ran
Frequency of use	This program will be run multiple times during the year at normal election times and special elections.
Triggers	The software finishes calculating and counted all the votes from the election
Preconditions	The software finished running
Postconditions	<ol style="list-style-type: none"> 1. The election results are displayed on the screen: 2. The type of election (Instant Runoff/Open Party) 3. The number of ballots counted in the election 4. The candidates and party 5. Ranking the candidates in order
Main Course	<ol style="list-style-type: none"> 1. Election is calculated by the software 2. The election results are displayed on the screen

Alternate Course	No results are displayed if the program is ended prematurely before calculations are complete.
Exceptions	No exceptions.

PRESS RELEASE FILE

Name	Create press release file
ID	BCS_08
Description	Create a file that can be given to the media to share the results of the election.
Actors	The system
Organizational Benefits	Announce the election results in a transparent way.
Frequency of use	This program will be run multiple times during the year at normal election times and special elections.
Triggers	Either the Instant Runoff (IR) or the Open Party Listing (OPL) algorithms finished determining the result of an election.
Preconditions	The IR or OPL algorithms completed without error.
Postconditions	A text file with all relevant information regarding the results of an election that the media could reasonably want. This would include winners, the parties they represent, the number of votes all candidates got, the total number of votes, etc.
Main Course	<ol style="list-style-type: none"> 1. The election results are calculated 2. Create a text file named “[currentDate_currentTime]PressRelease” 3. Write the relevant information to this new file 4. Indicate to the user that this press release file was completed and the file is in the same directory as the software
Alternate Course	No press release file is created if the program is ended prematurely before the file generation is complete.

Exceptions	There should be no exceptions at this point in the software run.
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