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| **Project Name: Project 1: Voting System Team#08** | |
| **Test Stage: Unit \_\_ System \_\_X** | **Test Date: 3/24/2023** |
| **Test Case ID#: SystemIR\_04** | **Name(s) of Testers: Ugtakhbayar Battulga** |
| **Test Description:**Testing the whole system with an IR election input ballot “IRElectionTests\_WinnerAndDropTie.csv”. The csv is an instance of an IR election that has one instance of a tie for a candidate being dropped and one tie to choose the winner for the election. | When running this test all files are in the same working directory which can be found in Project1/src. The csv files can be found in Project1/testing. The csv file used in this specific test is called IRElectionTests\_WinnerAndDropTie.csv |
| **Automated: yes\_\_\_ no \_X\_\_** |  |
| **Results: Pass \_\_\_\_X\_ Fail\_\_\_\_\_\_\_\_** |  |
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| **Preconditions for Test:**  An IRElection csv file is required to be in the Project1/testing directory titled “IRElectionTest\_WinnerAndDropTie.csv”. Makefile was called and exe files are ready to call. | |

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| **Step**  **#** | **Test Step**  **Description** | **Test**  **Data** | **Expected**  **Result** | **Actual**  **Result** | **Notes** |
| 1 | Running the system using  ./2-TypeElection.exe with the argument ../testing/IRElecitonTests\_WinnerAndDropTie.csv | ../testing/IRElecitonTests\_ WinnerAndDropTie.csv | N/A | N/A | Running with command line argument. System is given the file name |
| 3 | Entering the date of the IR election in format MMDDYYYY | Date in 03262004 format | N/A | N/A | Sets the date used for the audit file. |
| 4 | Election runs. | ../testing/IRElecitonTests\_ WinnerAndDropTie.csv | Expected results can be found below for both the terminal and the audit file | Actual results matched the expected results. Checked manually | The expected results and the actual results were manually checked and matched. Since there is a tie for a candidate to get dropped and tie for the winner of the election there is one expected output for the sudit file and multiple for the terminal output that can be found below. |

**Post condition(s) for Test:**

Audit file “03262004IR.txt” is created and results of the Election are printed to the terminal.

Test Passed

expectedResult for audit file:

IRElection

Number of Candidates: 5

Candidate 1: A

Candidate 2: B

Candidate 3: C

Candidate 4: D

Candidate 5: E

Number of ballots: 15

Ballot ID: 1 Ballot Info: 1,2,,3,

Ballot ID: 2 Ballot Info: 1,2,,,3

Ballot ID: 3 Ballot Info: 1,3,,4,2

Ballot ID: 4 Ballot Info: 3,1,2,,4

Ballot ID: 5 Ballot Info: 4,1,2,3,

Ballot ID: 6 Ballot Info: ,,1,,2

Ballot ID: 7 Ballot Info: 2,,1,3,4

Ballot ID: 8 Ballot Info: ,3,1,,2

Ballot ID: 9 Ballot Info: ,2,1,,3

Ballot ID: 10 Ballot Info: 2,,1,,

Ballot ID: 11 Ballot Info: 2,4,,1,3

Ballot ID: 12 Ballot Info: ,2,,,1

Ballot ID: 13 Ballot Info: 2,,3,4,1

Ballot ID: 14 Ballot Info: 2,3,,,1

Ballot ID: 15 Ballot Info: 2,,4,3,1

Counting Ballots

Ballot #1 went to Candidate #1

Ballot #2 went to Candidate #1

Ballot #3 went to Candidate #1

Ballot #4 went to Candidate #2

Ballot #5 went to Candidate #2

Ballot #6 went to Candidate #3

Ballot #7 went to Candidate #3

Ballot #8 went to Candidate #3

Ballot #9 went to Candidate #3

Ballot #10 went to Candidate #3

Ballot #11 went to Candidate #4

Ballot #12 went to Candidate #5

Ballot #13 went to Candidate #5

Ballot #14 went to Candidate #5

Ballot #15 went to Candidate #5

Candidate #1 received 3 vote(s)

Candidate #2 received 2 vote(s)

Candidate #3 received 5 vote(s)

Candidate #4 received 1 vote(s)

Candidate #5 received 4 vote(s)

No Majority Found with more than 2 Candidates remaining

Dropped Candidate Name: D

Redistribute Votes

Ballot #1 went to Candidate #1

Ballot #2 went to Candidate #1

Ballot #3 went to Candidate #1

Ballot #4 went to Candidate #2

Ballot #5 went to Candidate #2

Ballot #6 went to Candidate #3

Ballot #7 went to Candidate #3

Ballot #8 went to Candidate #3

Ballot #9 went to Candidate #3

Ballot #10 went to Candidate #3

Ballot #11 went to Candidate #1

Ballot #12 went to Candidate #5

Ballot #13 went to Candidate #5

Ballot #14 went to Candidate #5

Ballot #15 went to Candidate #5

Candidate #1 received 4 vote(s)

Candidate #2 received 2 vote(s)

Candidate #3 received 5 vote(s)

Candidate #4 received 0 vote(s)

Candidate #5 received 4 vote(s)

No Majority Found with more than 2 Candidates remaining

Dropped Candidate Name: B

Redistribute Votes

Ballot #1 went to Candidate #1

Ballot #2 went to Candidate #1

Ballot #3 went to Candidate #1

Ballot #4 went to Candidate #3

Ballot #5 went to Candidate #3

Ballot #6 went to Candidate #3

Ballot #7 went to Candidate #3

Ballot #8 went to Candidate #3

Ballot #9 went to Candidate #3

Ballot #10 went to Candidate #3

Ballot #11 went to Candidate #1

Ballot #12 went to Candidate #5

Ballot #13 went to Candidate #5

Ballot #14 went to Candidate #5

Ballot #15 went to Candidate #5

Candidate #1 received 4 vote(s)

Candidate #2 received 0 vote(s)

Candidate #3 received 7 vote(s)

Candidate #4 received 0 vote(s)

Candidate #5 received 4 vote(s)

No Majority Found with more than 2 Candidates remaining

Tie Has Occurred

Candidate dropped based of tieLoser: A

Redistribute Votes

Ballot #2 went to Candidate #5

Ballot #3 went to Candidate #5

Ballot #4 went to Candidate #3

Ballot #5 went to Candidate #3

Ballot #6 went to Candidate #3

Ballot #7 went to Candidate #3

Ballot #8 went to Candidate #3

Ballot #9 went to Candidate #3

Ballot #10 went to Candidate #3

Ballot #11 went to Candidate #5

Ballot #12 went to Candidate #5

Ballot #13 went to Candidate #5

Ballot #14 went to Candidate #5

Ballot #15 went to Candidate #5

Candidate #1 received 0 vote(s)

Candidate #2 received 0 vote(s)

Candidate #3 received 7 vote(s)

Candidate #4 received 0 vote(s)

Candidate #5 received 7 vote(s)

Remaining 2 Candidates with no majority move to popularity

Tie Has Occurred and after TieBreaker C has won with 7 Votes

expectedResult1 for terminal output:

      "Election type: IR\n"

      "Number of candidates: 5\n"

      "Number of ballots cast: 15\n"

      "IR Election results in last round: \n"

      "Number of votes for candidate number 1: 0 (0.00%)\n"

      "Number of votes for candidate number 2: 0 (0.00%)\n"

      "Number of votes for candidate number 3: 7 (46.67%)\n"

      "Number of votes for candidate number 4: 0 (0.00%)\n"

      "Number of votes for candidate number 5: 7 (46.67%)\n"

      "Winner: C\n"

expectedResult2 for terminal output:

      "Election type: IR\n"

      "Number of candidates: 5\n"

      "Number of ballots cast: 15\n"

      "IR Election results in last round: \n"

      "Number of votes for candidate number 1: 0 (0.00%)\n"

      "Number of votes for candidate number 2: 0 (0.00%)\n"

      "Number of votes for candidate number 3: 7 (46.67%)\n"

      "Number of votes for candidate number 4: 0 (0.00%)\n"

      "Number of votes for candidate number 5: 7 (46.67%)\n"

      "Winner: E\n"

expectedResult3 for terminal output:

      "Election type: IR\n"

      "Number of candidates: 5\n"

      "Number of ballots cast: 15\n"

      "IR Election results in last round: \n"

      "Number of votes for candidate number 1: 7 (46.67%)\n"

      "Number of votes for candidate number 2: 0 (0.00%)\n"

      "Number of votes for candidate number 3: 7 (46.67%)\n"

      "Number of votes for candidate number 4: 0 (0.00%)\n"

      "Number of votes for candidate number 5: 0 (0.00%)\n"

      "Winner: A\n"

expectedResult4 for terminal output:

      "Election type: IR\n"

      "Number of candidates: 5\n"

      "Number of ballots cast: 15\n"

      "IR Election results in last round: \n"

      "Number of votes for candidate number 1: 7 (46.67%)\n"

      "Number of votes for candidate number 2: 0 (0.00%)\n"

      "Number of votes for candidate number 3: 7 (46.67%)\n"

      "Number of votes for candidate number 4: 0 (0.00%)\n"

      "Number of votes for candidate number 5: 0 (0.00%)\n"

      "Winner: C\n"