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CPE 2600

Final Lab

See the repositories README for more details about the project and implementation. This report is for screenshots of the program running.

```
holden@AAD-PF4EEAF5:~/systemsProjects/final-project$ ./server -l 0
Usage: ./server -l 0 [-h]
Program will not close on its' own. Use Ctrl+C to close the program properly
Options:
  -l <load>  setting this to 0 will make it so the program doesn't load old votes
             any other number will load old votes which is also the default behavior

  -h         Show this help information

Storing new data, overwriting old
Socket created.
Bind done.
Waiting for incoming connections...
```

Starting Server with fresh voting data

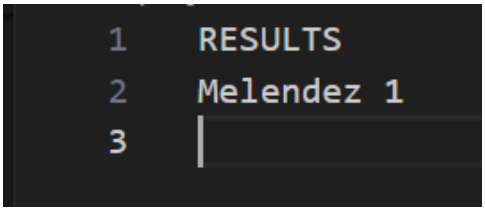
```
holden@AAD-PF4EEAF5:~/systemsProjects/final-project$ ./votingmachine -v "Melendez"
Voting Machine PID: 129142
Socket created.
Connected to server.
Vote sent: PID: 129142, Vote: Melendez ;
Voting Machine PID: 129142
Socket created.
Connected to server.
Vote sent: PID: 129142, Vote: Joe ;
Voting Machine PID: 129142
Socket created.
Connected to server.
Vote sent: PID: 129142, Vote: Melendez ;
```

Sending vote to the server. The program sends a fake vote as well as a second copy of the original vote to showcase the voter fraud detection.

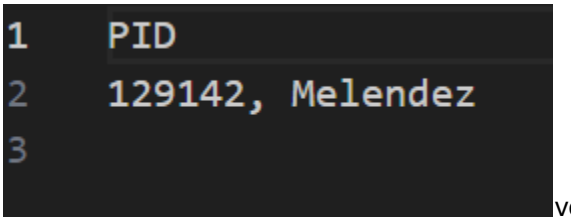
```
Connection accepted.
Received: PID: 129142, Vote: Melendez ;
Received vote from PID: 129142
Vote: Melendez
Initialized count for Melendez: 1
COUNT for Melendez: 1
NEW VOTE: PID 129142; Candidate: Melendez; VOTE TOTAL: 1
Client disconnected.
Waiting for incoming connections...
Connection accepted.
Received: PID: 129142, Vote: Joe ;
Received vote from PID: 129142
Vote: Joe
VOTER FRAUD DETECTED: PID 129142
Client disconnected.
Waiting for incoming connections...
Connection accepted.
Received: PID: 129142, Vote: Melendez ;
Received vote from PID: 129142
Vote: Melendez
VOTER FRAUD DETECTED: PID 129142
Client disconnected.
Waiting for incoming connections...
```

Server terminal: Processes the initial vote from the voting machine, then detects fraud for the other votes and doesn't count them.

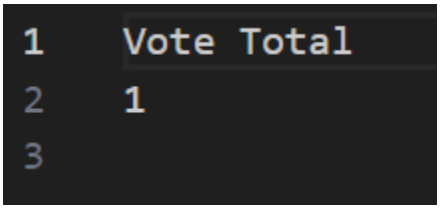
The Results are then saved to .csv files



results.csv



voterinfo.csv



votetotal.csv

```
holden@AAD-PF4EEAF5:~/systemsProjects/final-project$ ./server
Usage: ./server -l 0 [-h]
Program will not close on its' own. Use Ctrl+C to close the program properly
Options:
  -l <load>  setting this to 0 will make it so the program doesn't load old votes
             any other number will load old votes which is also the default behavior

  -h         Show this help information

Loading votes...
Loaded 1 voters

Socket created.
Bind done.
Waiting for incoming connections...
```

Starting server again to load old votes and start receiving new votes.

```
holden@AAD-PF4EEAF5:~/systemsProjects/final-project$ ./votingmachine -v "Jefferson"
Voting Machine PID: 130043
Socket created.
Connected to server.
Vote sent: PID: 130043, Vote: Jefferson ;
Voting Machine PID: 130043
Socket created.
Connected to server.
Vote sent: PID: 130043, Vote: Joe ;
Voting Machine PID: 130043
Socket created.
Connected to server.
Vote sent: PID: 130043, Vote: Jefferson ;
holden@AAD-PF4EEAF5:~/systemsProjects/final-project$ ./votingmachine -v "Jefferson"
Voting Machine PID: 130050
Socket created.
Connected to server.
Vote sent: PID: 130050, Vote: Jefferson ;
Voting Machine PID: 130050
Socket created.
Connected to server.
Vote sent: PID: 130050, Vote: Joe ;
Voting Machine PID: 130050
Socket created.
Connected to server.
Vote sent: PID: 130050, Vote: Jefferson ;
```

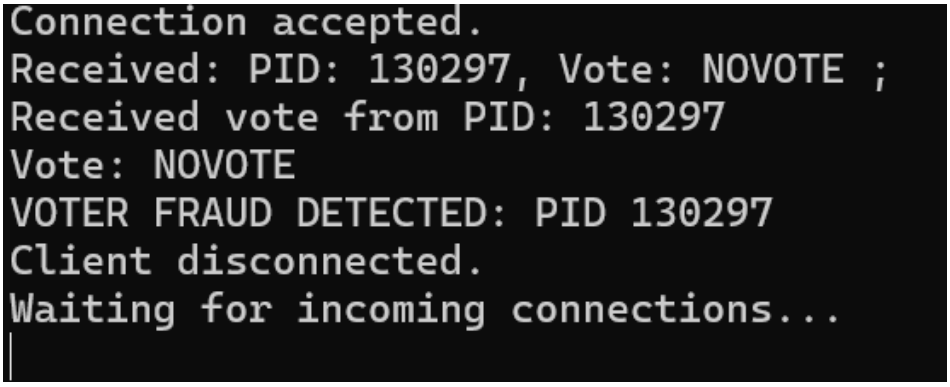
Sending new votes to server with different PIDs

```
Socket created.
Bind done.
Waiting for incoming connections...
Connection accepted.
Received: PID: 130043, Vote: Jefferson ;
Received vote from PID: 130043
Vote: Jefferson
Initialized count for Jefferson: 1
COUNT for Jefferson: 1
NEW VOTE: PID 130043; Candidate: Jefferson; VOTE TOTAL: 2
Client disconnected.
Waiting for incoming connections...
Connection accepted.
Received: PID: 130043, Vote: Joe ;
Received vote from PID: 130043
Vote: Joe
VOTER FRAUD DETECTED: PID 130043
Client disconnected.
Waiting for incoming connections...
Connection accepted.
Received: PID: 130043, Vote: Jefferson ;
Received vote from PID: 130043
Vote: Jefferson
VOTER FRAUD DETECTED: PID 130043
Client disconnected.
Waiting for incoming connections...
Connection accepted.
Received: PID: 130050, Vote: Jefferson ;
Received vote from PID: 130050
Vote: Jefferson
Updated count for Jefferson: 2
COUNT for Jefferson: 2
NEW VOTE: PID 130050; Candidate: Jefferson; VOTE TOTAL: 3
Client disconnected.
Waiting for incoming connections...
Connection accepted.
Received: PID: 130050, Vote: Joe ;
```

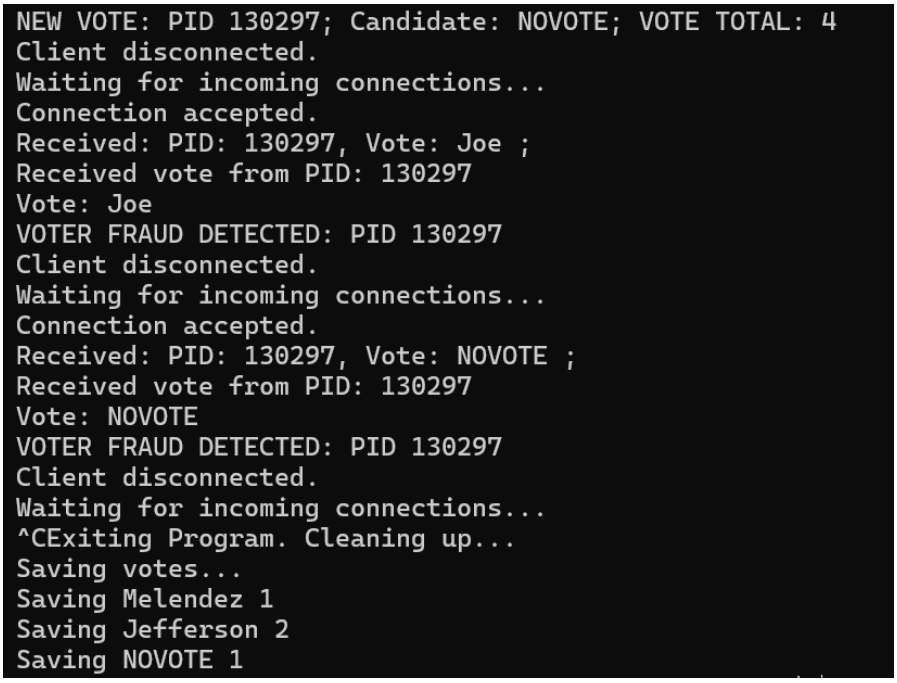
Server receiving new votes

```
holden@AAD-PF4EEAF5:~/systemsProjects/final-project$ ./votingmachine
Voting Machine PID: 130297
Socket created.
Connected to server.
Vote sent: PID: 130297, Vote: NOVOTE ;
Voting Machine PID: 130297
Socket created.
Connected to server.
Vote sent: PID: 130297, Vote: Joe ;
Voting Machine PID: 130297
Socket created.
Connected to server.
Vote sent: PID: 130297, Vote: NOVOTE ;
```

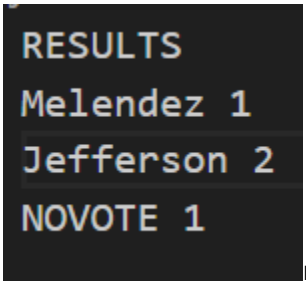
Sending default NOVOTE to server (citizen decided to not vote for a candidate)



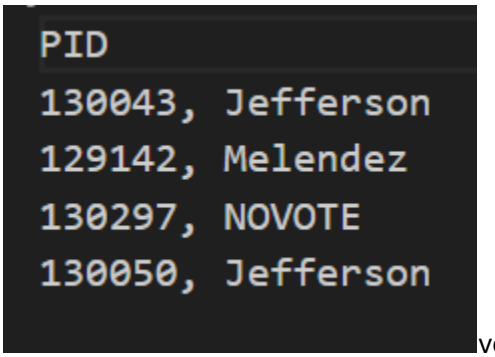
Server receiving NOVOTE



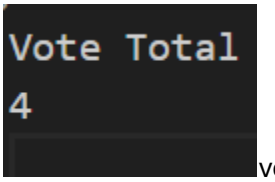
Closing server and saving votes



results.csv



voterinfo.csv (129142 is there again like last time)



votertotal.csv

```
Saving votes...
Saving Melendez 1
Saving Jefferson 4
Saving NOVOTE 1
==131123==
==131123== HEAP SUMMARY:
==131123==     in use at exit: 16,768 bytes in 7 blocks
==131123==   total heap usage: 57 allocs, 50 frees, 46,090 bytes allocated
==131123==
==131123== LEAK SUMMARY:
==131123==    definitely lost: 0 bytes in 0 blocks
==131123==    indirectly lost: 0 bytes in 0 blocks
==131123==      possibly lost: 0 bytes in 0 blocks
==131123==    still reachable: 16,768 bytes in 7 blocks
==131123==         suppressed: 0 bytes in 0 blocks
==131123== Rerun with --leak-check=full to see details of leaked memory
==131123==
==131123== For lists of detected and suppressed errors, rerun with: -s
==131123== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```

Valgrind result for server program (still reachable is okay) Also ignore that the vote totals are different, I had to run it again to valgrind because the program initially didn't run with it.

```
Vote sent: PID: 131405, Vote: Jefferson ;
==131405==
==131405== HEAP SUMMARY:
==131405==     in use at exit: 0 bytes in 0 blocks
==131405==   total heap usage: 1 allocs, 1 frees, 1,024 bytes allocated
==131405==
==131405== All heap blocks were freed -- no leaks are possible
==131405==
==131405== For lists of detected and suppressed errors, rerun with: -s
==131405== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```

Valgrind result for voting machine program

```
holden@AAD-PF4EEAF5:~/systemsProjects/final-project$ ./server -l 0
Usage: ./server -l 0 [-h]
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Options:
  -l <load>  setting this to 0 will make it so the program doesn't load old votes
             any other number will load old votes which is also the default behavior

  -h         Show this help information

Storing new data, overwriting old
Socket created.
Bind done.
Waiting for incoming connections...
^CExiting Program. Cleaning up...
Saving votes...
```

Starting server with fresh results (we can see votes were not loaded).