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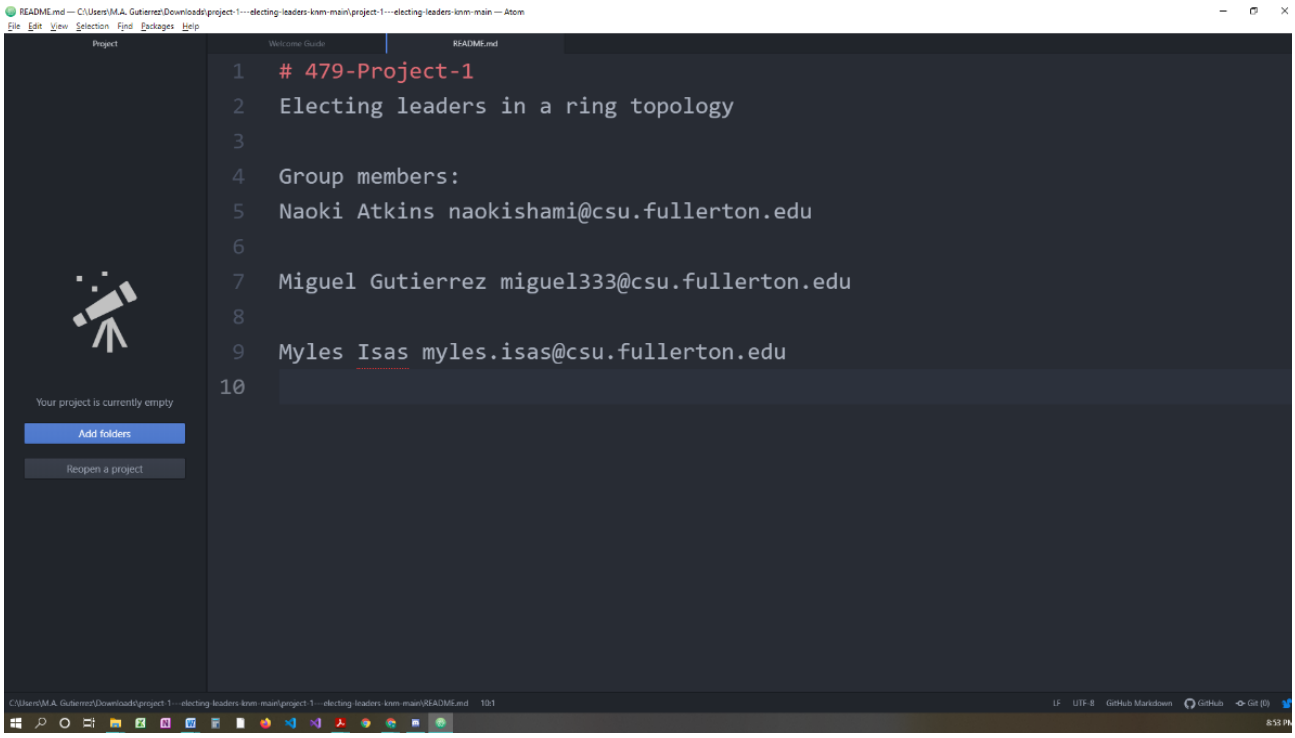
CPSC 479
PROJECT 1 REPORT:



Pseudocode for the Chosen Algorithm: *Concurrent Two Leader Election Algorithm*

Generator() - random number generator
compare_and_set() - compare and set value for gen value and rank

```
Main Module()
        Declare rank and size
        Set up and Initialize MPI
        Declare and initialize leaders array
        If (rank !- 0)
                MPi_Recv
                Call generator()
                Call compare_and_set
        Else
                Call generator()
                Call compare_and_set
        MPI_Send

        If rank == 0
```

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MPI_recv
Output process number and received leaders
Outputs president vice president rank and value

MPI FInalize()

Brief Description on How to Run the Code

This program submission is written in C. To Run the code, download the C file (file is “ring.c”) and compile the file using mpicc. MPICC is an Open MPI C wrapper compiler that we will use for the C file.

To compile, utilize the following command: “mpicc ring.c”.

Subsequently, after successfully compiling, one can use the with the following command: “mpirun -n 20 a.out”.

The -n flag is used for -N <num> which will launch num processes per node on all allocated nodes.

Two snapshots of code executing for some two distinct values of N.

Snapshot 1

```
[naokishami@titanv1 Proj1]$ mpicc ring.c
[naokishami@titanv1 Proj1]$ mpirun -n 15 a.out
Process 1 received leaders 1510, 1 from process 0
Process 2 received leaders 1510, 1801 from process 1
Process 3 received leaders 1510, 1801 from process 2
Process 4 received leaders 1510, 1801 from process 3
Process 5 received leaders 1510, 1801 from process 4
Process 6 received leaders 1510, 1801 from process 5
Process 7 received leaders 1510, 1801 from process 6
Process 8 received leaders 1510, 1801 from process 7
Process 9 received leaders 1510, 1801 from process 8
Process 10 received leaders 1510, 1801 from process 9
Process 11 received leaders 1680, 1801 from process 10
Process 12 received leaders 1680, 1801 from process 11
Process 13 received leaders 1822, 1801 from process 12
Process 14 received leaders 1822, 1801 from process 13
Process 0 received leaders 1894, 1801 from process 14
The president is 1 with a value of 1801 and the vice president is 14 with a value of 1894
[naokishami@titanv1 Proj1]$
```

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Snapshot 2