# Program Overview

A concise description of the design of your program, including a flowchart or other schematic representation.

# Program Validation

A description of the tests that you performed to verify the correctness of your program.

We might also include any missing features/robustness here

* PowerFlow
  + I calculated the current by hand to verify that the current I got from my code equation matched. After I determined that the current matched, I calculated the power by hand and then checked to see if my code output matched the values I got. I then checked to see if those values matched the sample results that are given for the 3-bus example.
* LineFlowResults
  + After assigning each variable a value, I printed the variable to ensure that its value was what I intended for each iteration of the loop. I then checked the resulting powers that I got for inputting those variables into my PowerFlow functions and compared them to the 3-bus sample results. I also checked the line power violation results to see if they also matched with the results from the 3-bus sample problem. I printed out the results of running the function to ensure that the output was what I expected.
* BusResults
  + Like with the LineFlowResults function, I started by printing each variable to make sure they were the values that I intended them to be. I also checked the list of bus voltage violations to see if they matched the 3-bus sample and changed the input values to make sure the if/else loop worked as intended.
* DataOutput
  + Since I was not very familiar with the subfunctions used in this function, I started by checking the format of the created excel spreadsheet and tried changing different inputs to the subfunctions until I obtained a format that fit what I needed. I then created a new excel file after every data addition to ensure that the data was properly being exported to the file.

# Results

## Base Case

V, Theta, P, Q, Violations

P, Q, S in each line, Violations

Convergence record (P, Q Mismatch)

## Contingency 1

V, Theta, P, Q, Violations

P, Q, S in each line, Violations

## Contingency 2

V, Theta, P, Q, Violations

P, Q, S in each line, Violations

## Discussion of Results

Do they make sense? Why?

# Team Contribution

“I helped”

-Eliot Nichols

# Appendix

<http://www.planetb.ca/projects/syntaxHighlighter/popup.php>