**Jacobian Initialized and Sized Correctly:**

PowerWorld Jacobian

A screenshot of a computer

Description automatically generated

A screenshot of a computer

Description automatically generated

*As seen above PowerWorld shows a 14x14 Jacobian. However PowerWorld does not eliminate rows and columns for the slack bus and voltage control buses. You can see the blank spaces for this which, when eliminated results in an 11x11 Jacobian.*

Python Jacobian:

A screen shot of a computer screen

Description automatically generated

*Above is a screen grab of my initialized jacobian in python. It resultes in an 11x11 Jacobian by taking the number of buses and developing primitive matrices for J1, J2, J3 and J4 based on subtracting the slack bus and PV buses in the correct quadrant, then combining all the primitive matrices into a final Jacobian matrix.*

**Power Mismatch Initialized and Sized Correctly:**

PowerWorld Mismatch

A screenshot of a computer

Description automatically generated

*As seen above for power mismatch, we can see there are two columns (one for real and one for reactive power) and there are 7 rows for the 7 buses.*

Python Mismatch:

A screen shot of a computer code

Description automatically generated

*Above is a screen grab of my initialized power mismatch in python resulting in the two columns for Real and Reactive power and the 7 rows for the 7 buses.*

**Solution Vector Initialized and Sized Correctly:**

A black background with white letters

Description automatically generated

*In python I was able to get the X Vector initialized and sized to have the delta angles in the first row and the voltages in the second row to get a 7 column, 2 row matrix for the X Vector.*