**ELEN 90074 Introduction to Power Engineering**

**Workshop 1 Report**

**Task 1**

**Matlab simulation of the two studies**

1. Calculation of the line impedance parameter for the models.

Study 1

Given that for the Pi section, Ztl = R + j = 0.0455 + j0.1818

Therefore

Given that Csh = 0.00088pu

Study 2

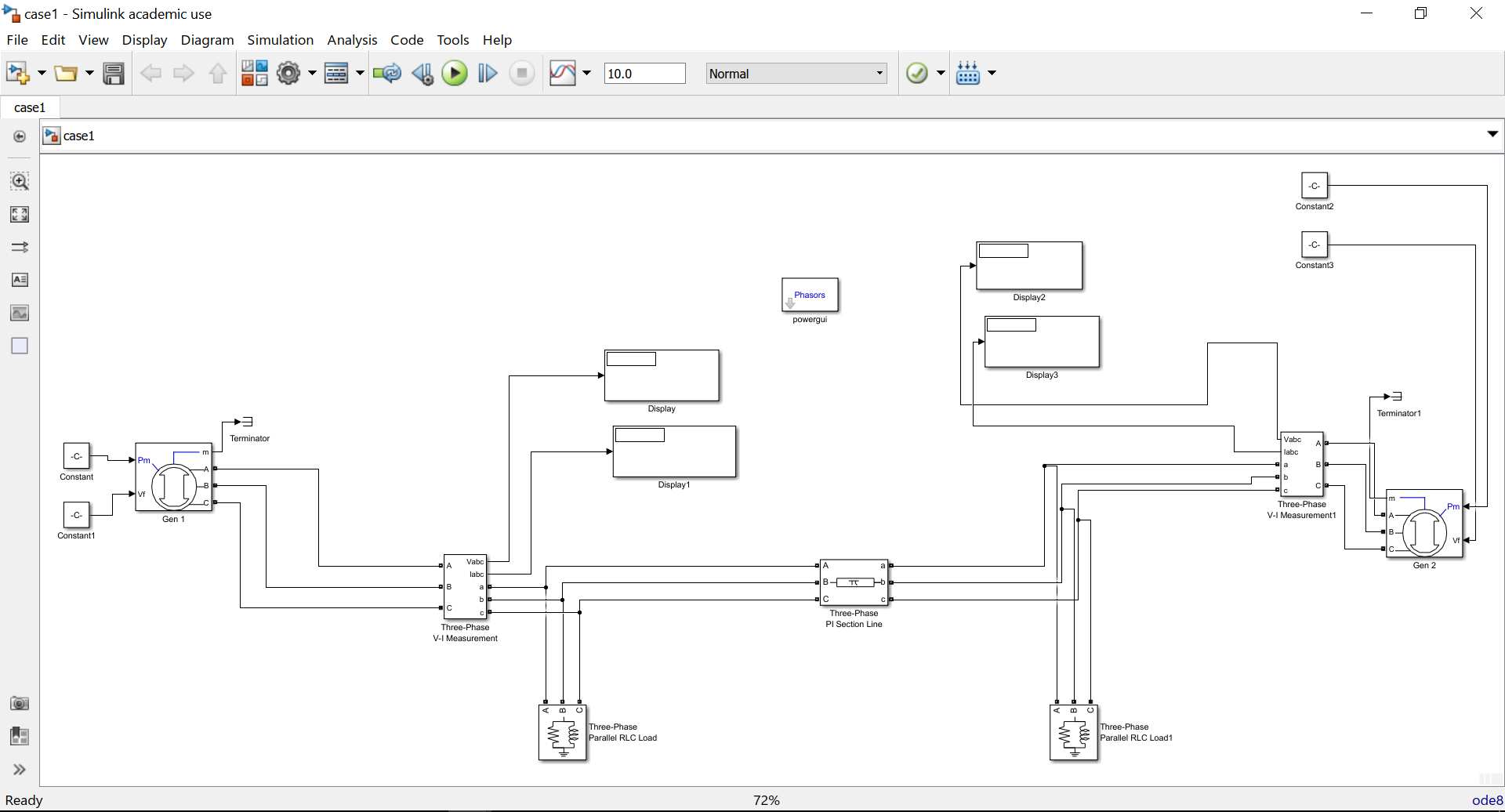
Given that for the T section, Ztl = R + j = 0.1818 + j0.7273

Therefore

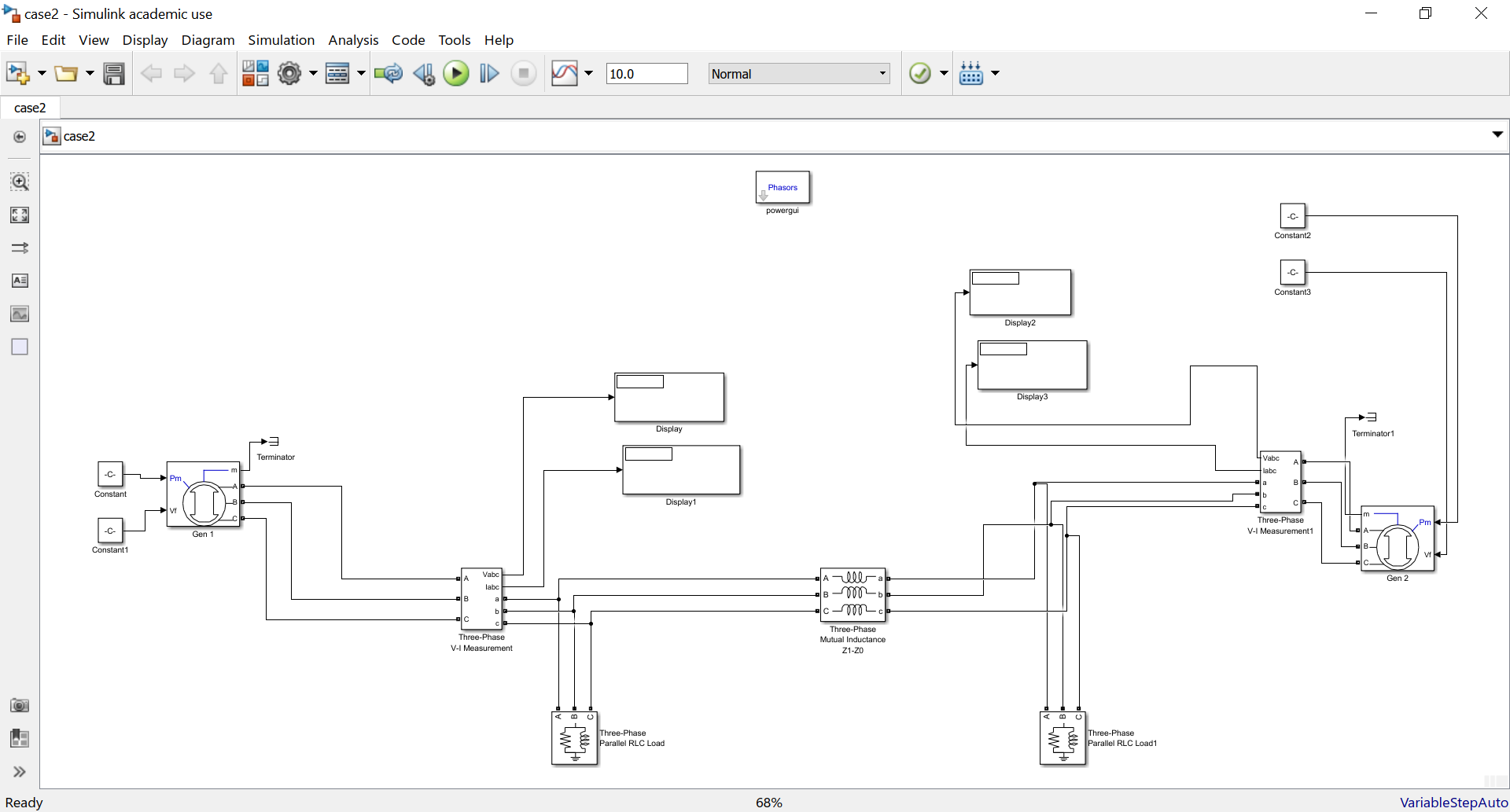
1. Use the simPowerSystem toolbox of Matlab/Simulink to construct the power system shown in Figure 1.

Models constructed as below show.

Study 1.

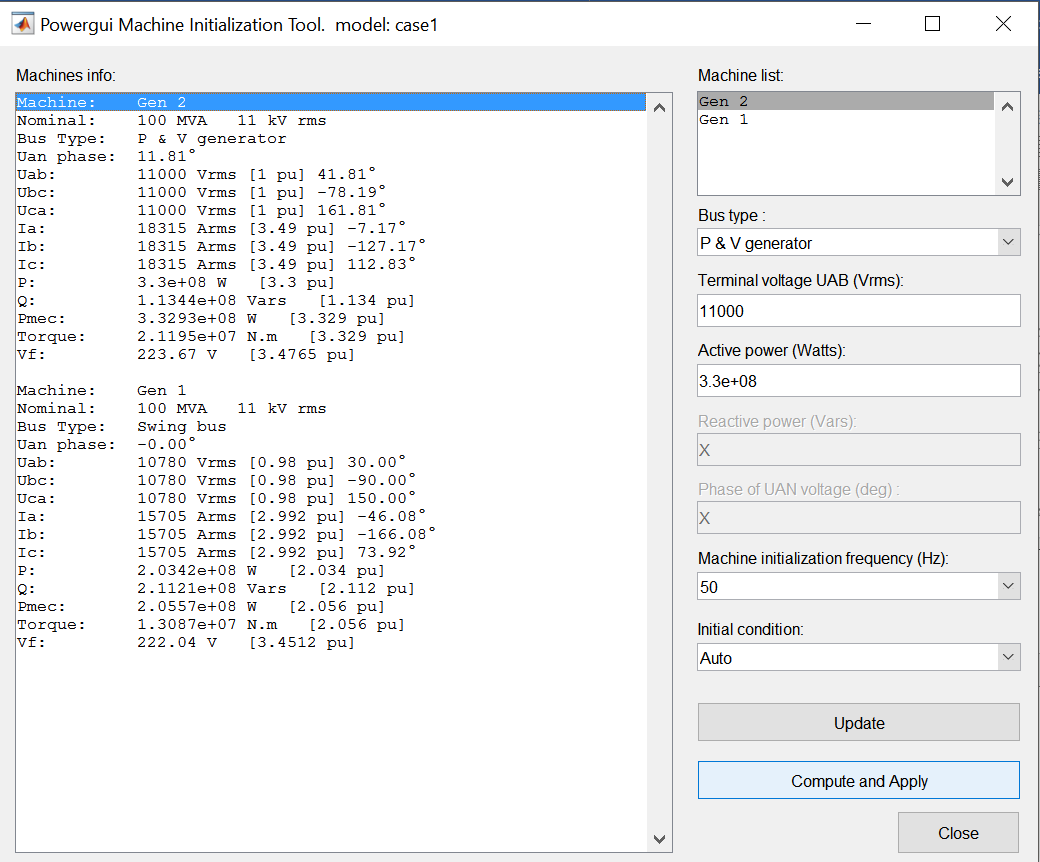


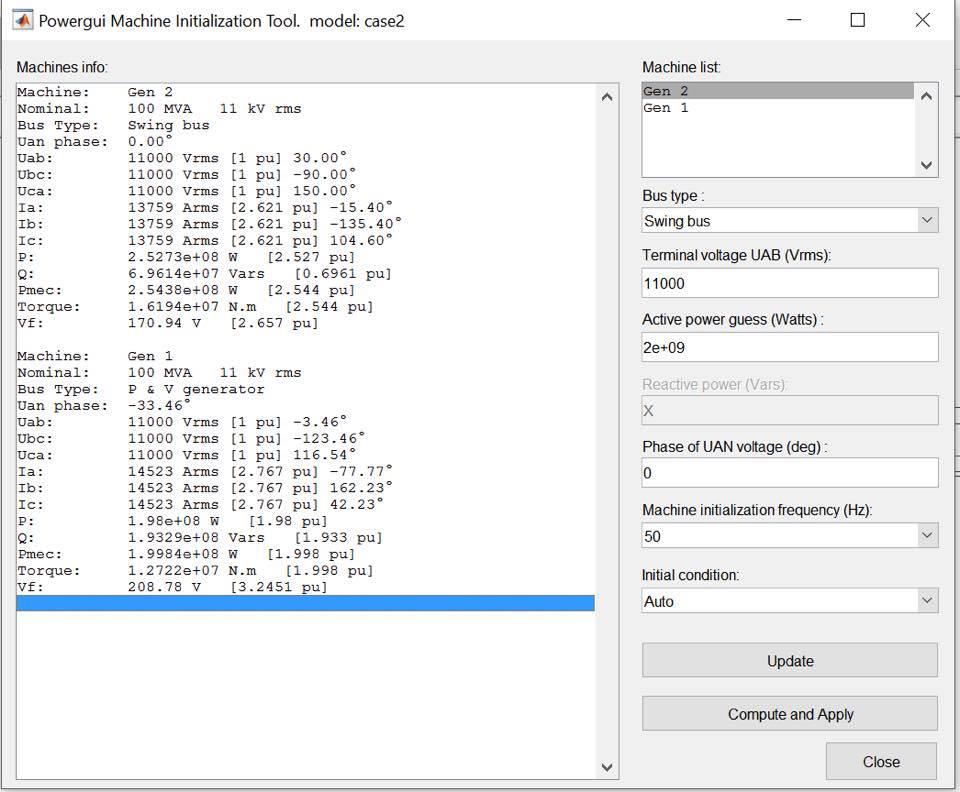
Study 2



1. Report generated by simulations

Study 1



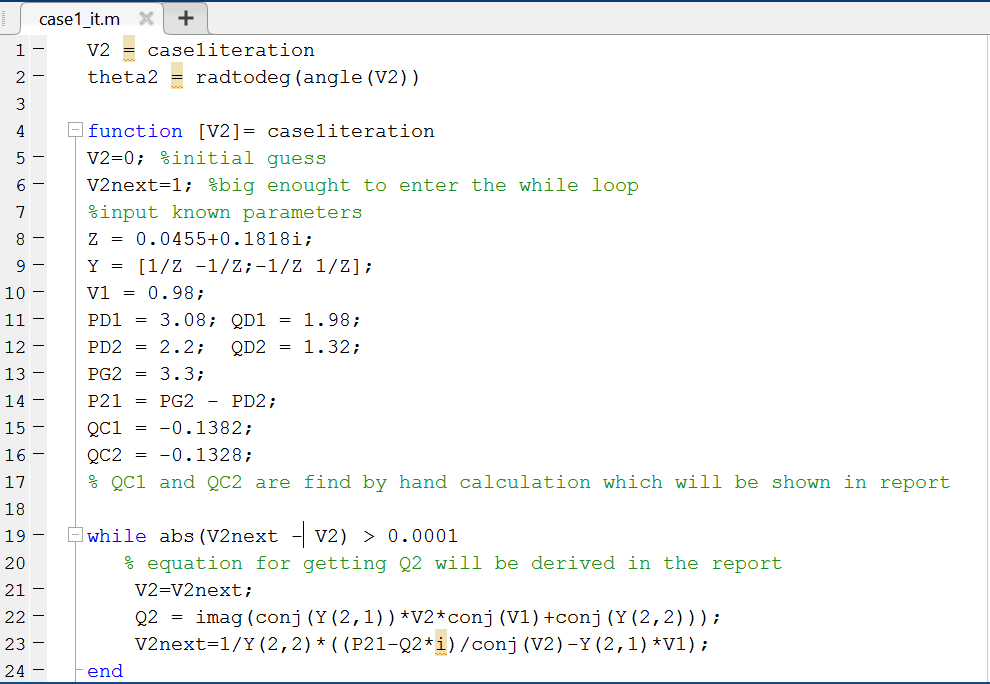
Study 2

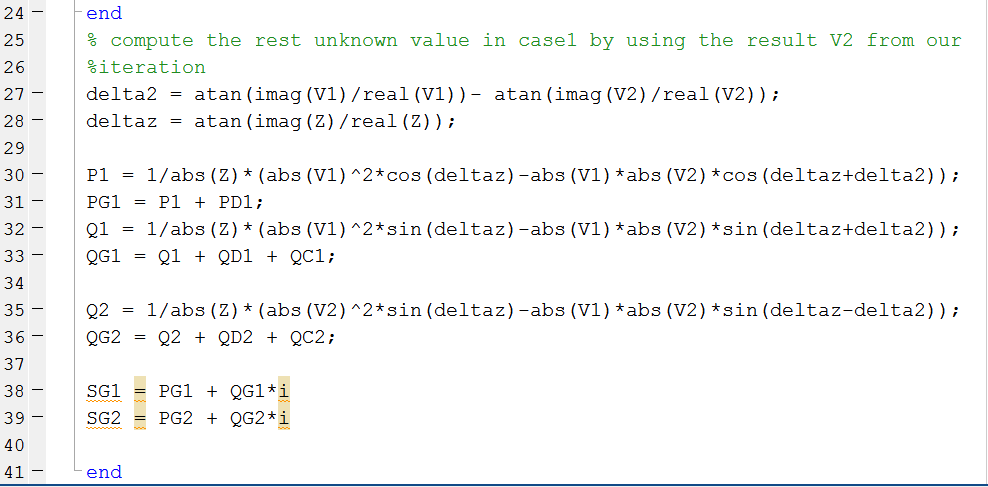
1. Power balance discussion

Make sure that solution achieves active and reactive power balance throughout the whole system.

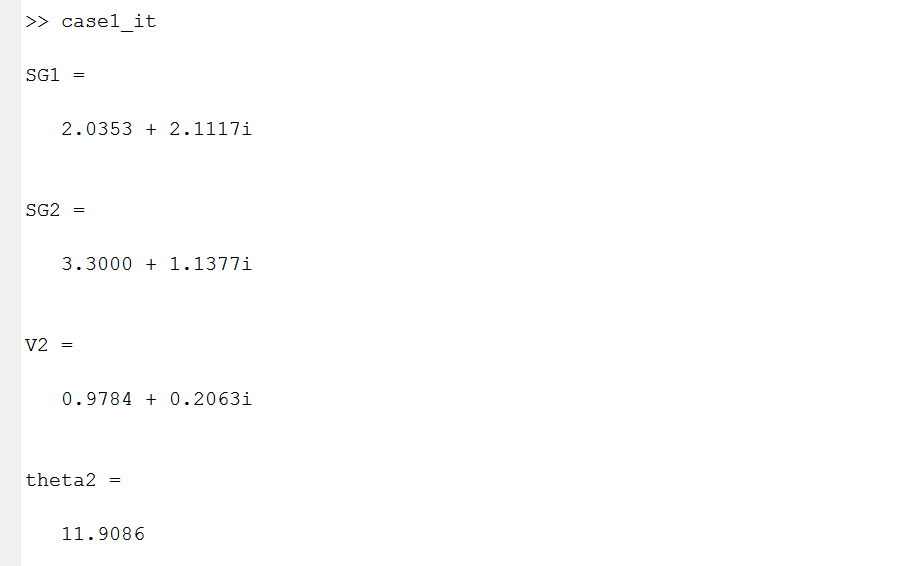
**Task 2: Write a Matlab .m function to compute the missing variables in each of the three cases using Gauss-Seidel iterative method. In your Matlab program define (using comments) all variables and all parameters. Copy the code and paste it into your report.**

**Study 1**

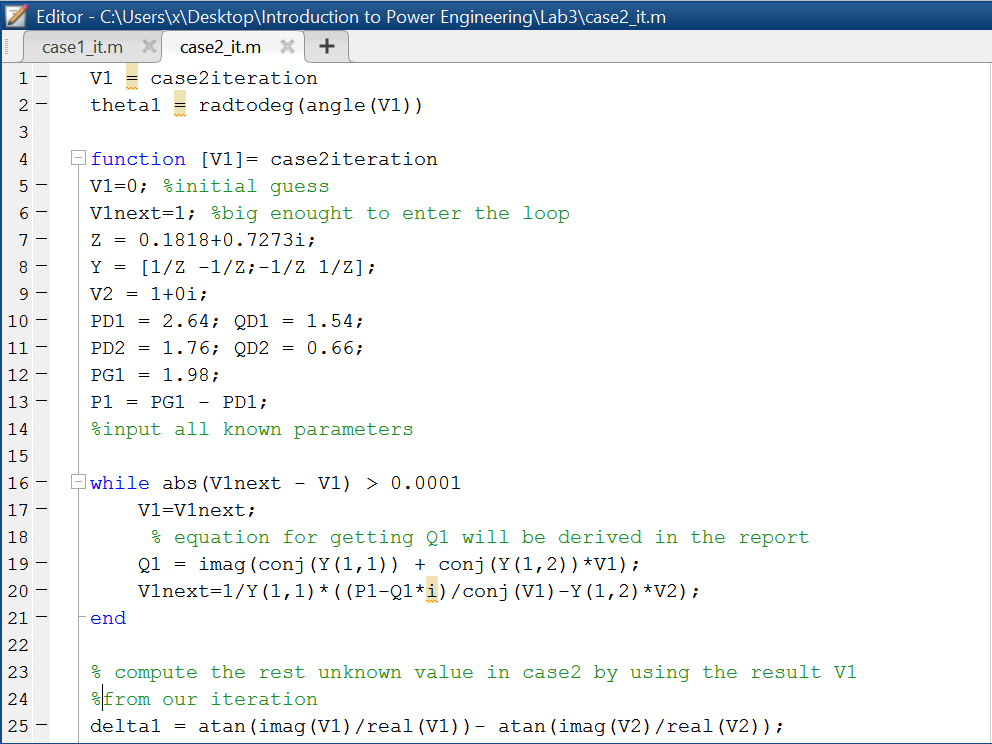


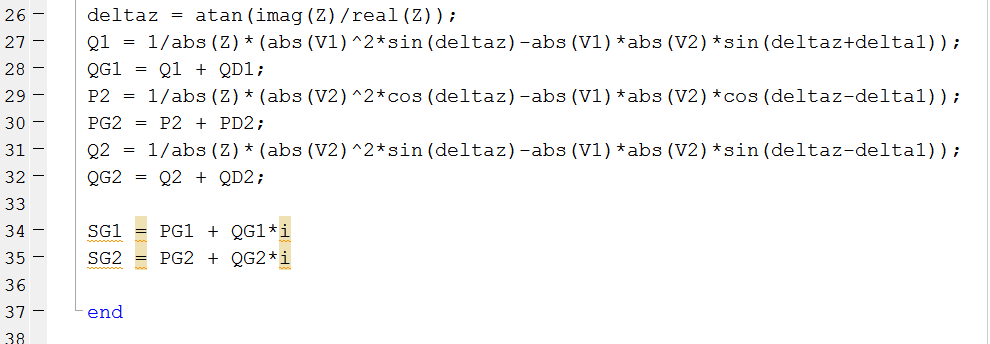


**Results**

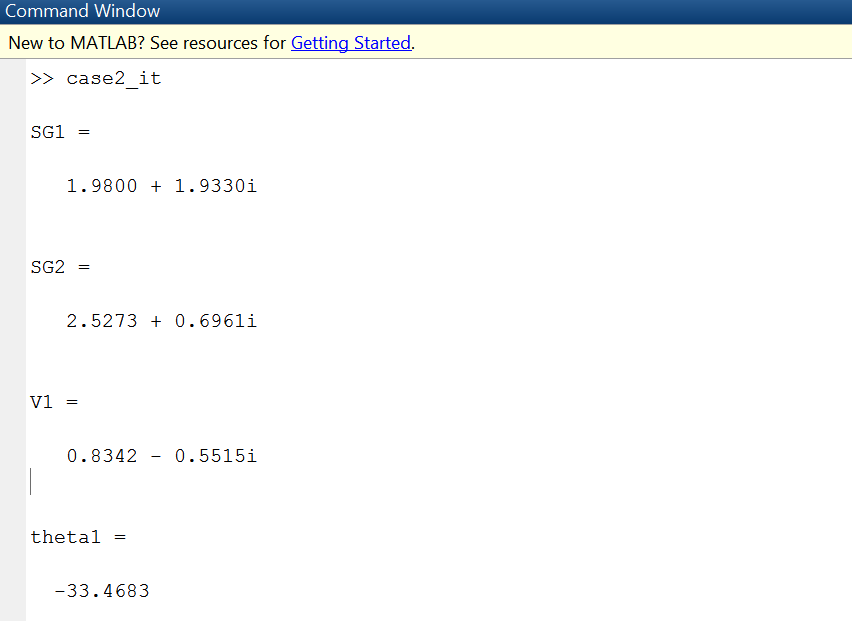


**Study 2**





**Result**



**Task 3: Calculate analytically (hand calculation) the missing variables. Verify the results for both the studies.**

**Study 1**

Therefore

For shunt capacitance C\_sh = 0.00088pu, so Csh1 = 0.00044 = C\_sh2

To sumup with

**Study 2**

Therefore

Therefore

**Task 4: Tabulate the results obtained from Tasks 1-3. Comment on the results.**

**The unknown in each study are tabulated for comparison purpose.**

**Study 1**