

Analysis of electrical power and energy systems

Programming Assignment 1

6 October 2022

In programming assignment 1, you are asked to solve a power flow using Newton-Raphson method. You are given an electrical network composed of 1 *PV* bus, 2 *PQ* buses and a slack bus. You are asked to fill in the given template named *pf1_template.py*, then upload it on **Gradescope** (after renaming it *pf1.py*). Do not forget to indicate your case number (*CASE = your case number*). Pay also attention to be consistent with the bus indices. For instance, in the bus admittance matrix, column 1 and row 1 correspond to the self admittance of bus 1, etc,... A power flow for a 3-bus system has already been solved, and comes with the other files that you have received (*pf1.py*). In the tables below, you will find the type of buses, and the topology of the electrical network corresponding to your case number.

Your case number is: **0**

BUS0		BUS1		BUS2	
V	θ	P	V	P	Q
1	0	2	1.05	5	1

Table 1: Bus information. Values are given in pu and in radians. PV buses are generator buses : P is the active power produced. PQ buses are considered as load : P and Q are the active and reactive powers consumed.

	BUS0	BUS1	BUS2
Coordinates (xy) in km	(0, 0)	(100, 111.8034)	(200, 0)
Connections	BUS1	BUS2	BUS0

Table 2: Bus information. Position given in km along the x and y-axis. The Connections row gives the buses to which the current bus is connected.

The due date is: **20 October 2022**