Lab 3 : KVL and KCL Verification

Name:_____ **Matric. No.**_____ **Day / Table No.**_____	**Activities Completed**	**Verified By**	**Marks From** 2
	Preparatory Work		
	A		
	B		
	C		

1. Objectives of the Experiment

a) To build circuits on breadboard from circuit schematics.
b) To apply and verify KVL and KCL.

2. Equipment to be used

- Lab DC power supply
- Digital multi-meter
- Breadboard

3. Components

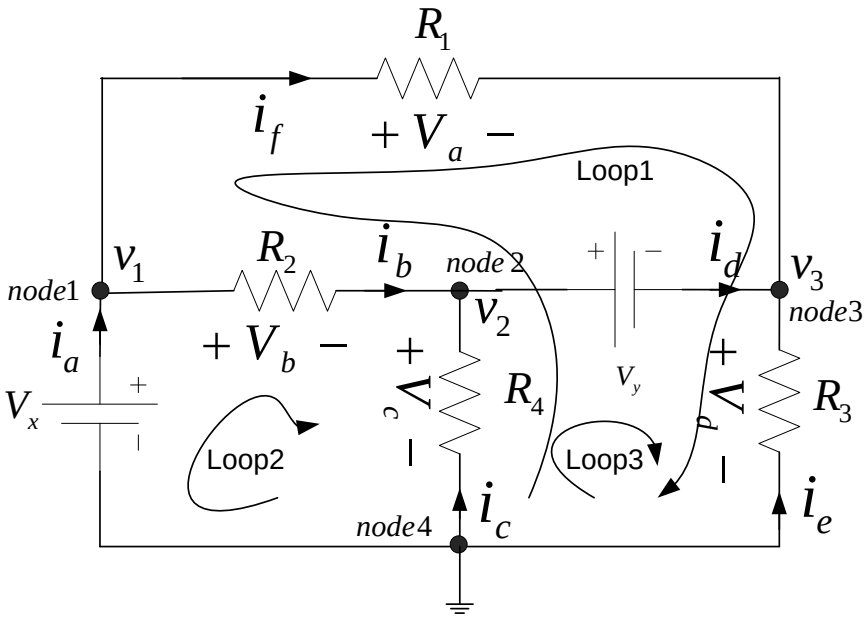
- Resistors

Preparatory Work (Individual)

<u>This component is to be completed in your own time before your lab session.</u>

By building and simulating the circuit in LTspice, obtain the values of the voltages and currents as denoted in the circuit below.

Available component values can be found in “DSA Component List” in IVLE’s Lab folder.



V_x = V_y =

R_1 = R_2 = R_3 = R_4 =

(1) Simulation Results :

V_a = V_b = V_c = V_d =

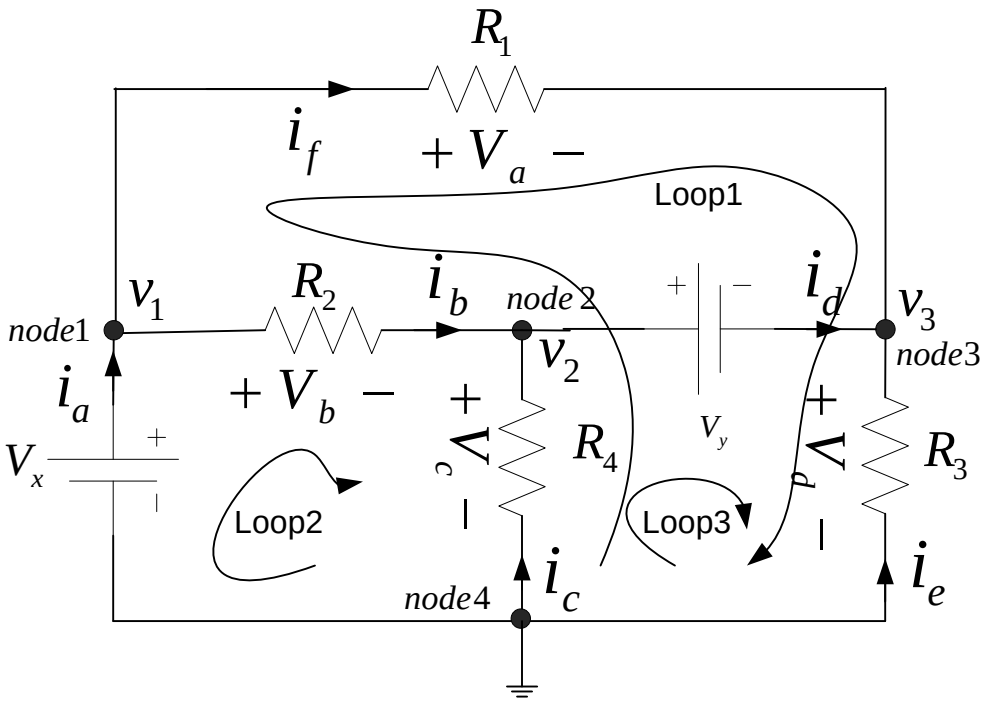
i_a= i_b= i_c=

i_d= i_e= i_f=

[15mins]

In-lab activities

Using the values you have chosen in the LTSpice simulation, build the circuit on the bread-board according to the schematic.



Note down the values of the voltage sources and the resistors :

V_x = V_y =

R_1 = R_2 = R_3 = R_4 =

a) **Measure the voltages** using the multimeter and note down below**:**

V_a = V_b =

V_c = V_d =

Write <u>KVL</u> equations for the following loops and verify that KVL is satisfied.

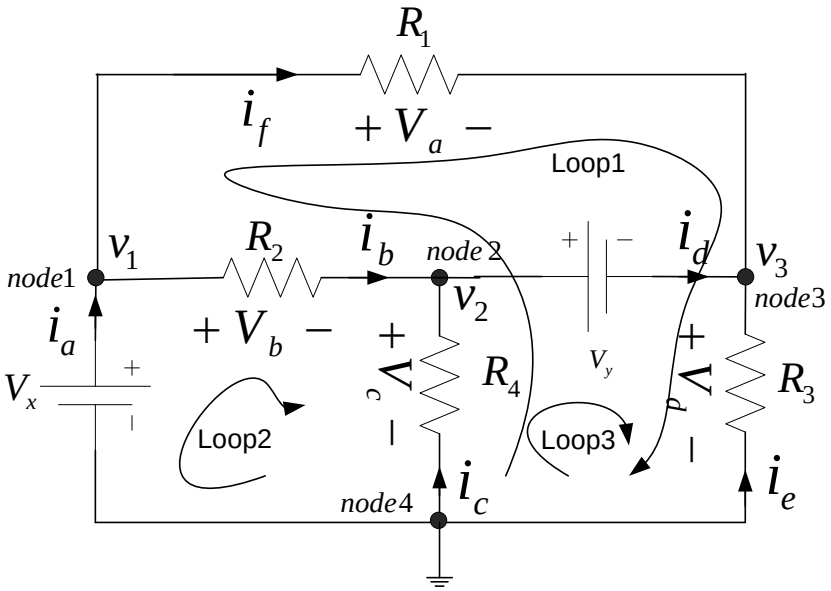
Loop 1:

Loop 2:

Loop 3:

[30%, 60mins]

b) For the same circuit as in (a), **measure the current in each branch using the multimeter**.



i_a= i_b= i_c=

i_d= i_e= i_f=

Write KCL equations for the following loops and verify that KCL is satisfied.

Node 1:

Node 2:

Node 3:

Node 4:

[50%, 60mins]

c) **Measure the node voltages v1, v2, v3 with respect to ground** and note them down. (Assume Node 4 is ground.)

v_1= v_2= v_3=

Calculate the currents using the node voltages and the resistor values.

I_b=

I_c=

I_e=

I_f=

[20%, 30mins]