Verification of Kirchhoff's Laws

Aim: To verify Kirchhoff's current and Kirchhoff's voltage laws in a DC circuit by using MATLAB-Simulink simulations

Circuit diagram:

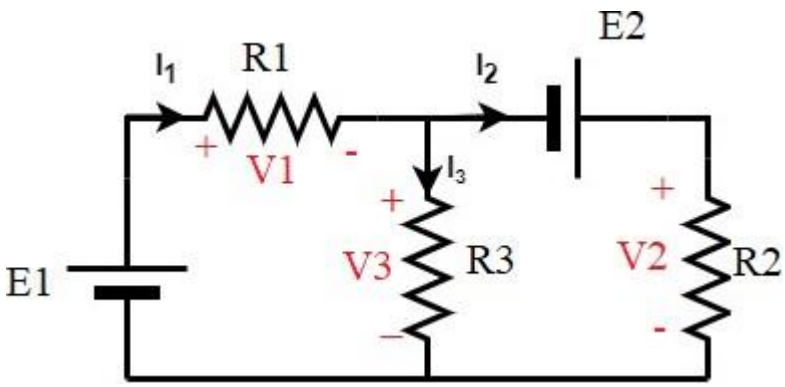


Figure 1: To verify KCL

R_1= 20 Ω R_2 = 15 Ω R_3 = 10 Ω

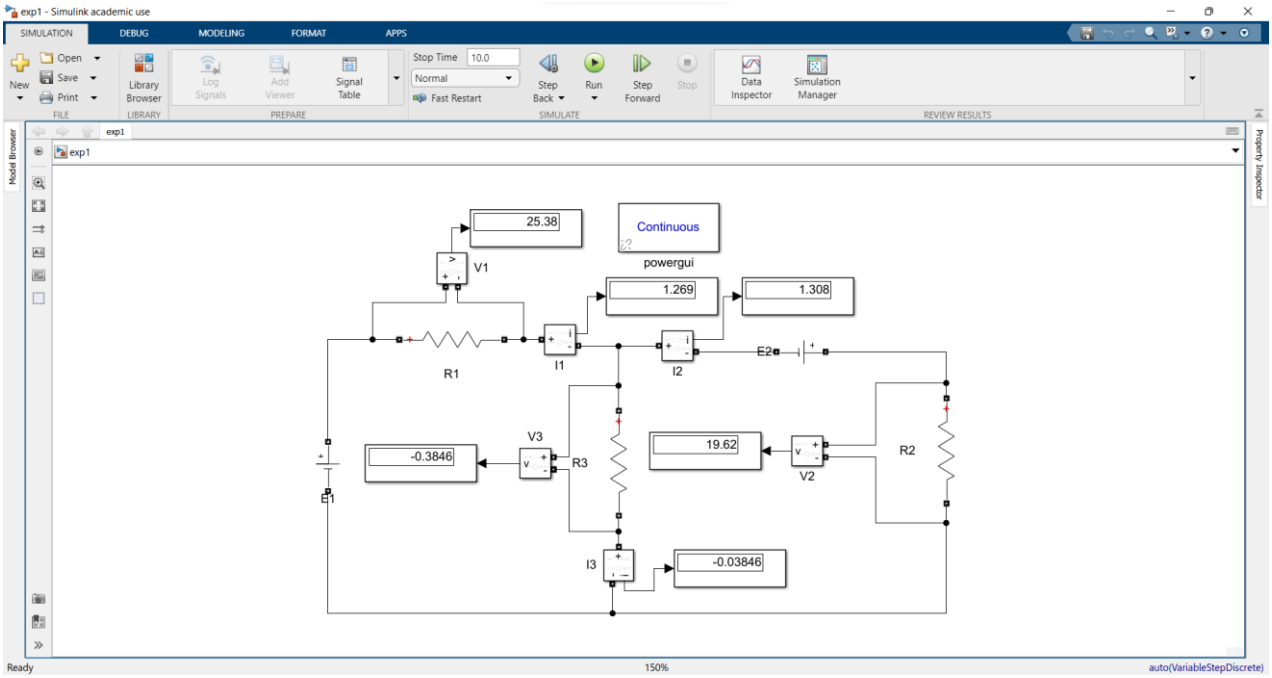
E_1 (V)	E_2 (V)	I_1 (A)	I_2 (A)	I_3 (A)	I_1- I_2- I_3 (A)
20	30	1.231	1.692	-0.4615	0.0005
10	30	0.8462	1.538	-0.6923	0.0005
25	20	1.269	1.308	-0.03846	0.00054

Figure 2: To verify KVL

R_1= 20 Ω R_2 = 15 Ω R_3 = 10 Ω

E_1 (V)	E_2 (V)	V_1 (V)	V_2 (V)	V_3 (V)	E_1- V_1- V_3 (V)	E_2- V_2+ V_3 (V)
20	30	24.62	25.38	-4.615	0.005	0.005
10	30	16.92	23.08	-6.923	0.003	0.003
25	20	25.38	19.62	-0.3846	0.0046	0.0046

Screen shot of simulation diagram:



Result:

The given DC circuit is simulated on MATLAB-Simulink platform and KCL and KVL is verified