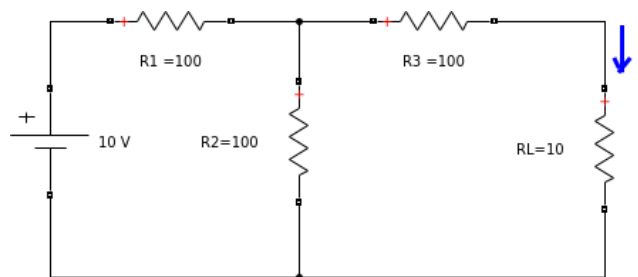


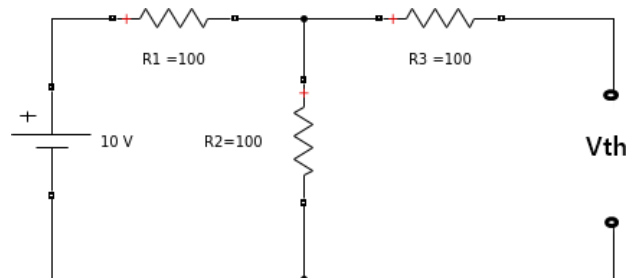
Verification of Thevenin's Theorem

Aim: To verify Thevenin's theorem in a DC resistive circuit by simulating the circuit on MATLAB-Simulink platform.

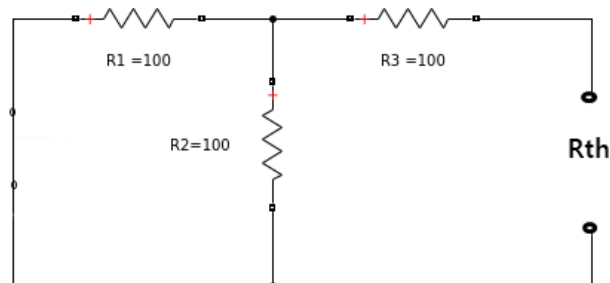
Theory: Thevenin's theorem is useful in solving complex AC and DC networks with many active and passive elements. This method involves reduction of the network into an equivalent network with only an equivalent voltage source and equivalent impedance in series with the load. In a DC circuit, the equivalent voltage source (V_{TH}) value will be equal to the open circuit voltage across the open circuited load terminals and the equivalent resistance value (R_{TH}) will be the resistance feeling at the load terminals when all the sources in the circuit is set to zero.



The circuit to be solved



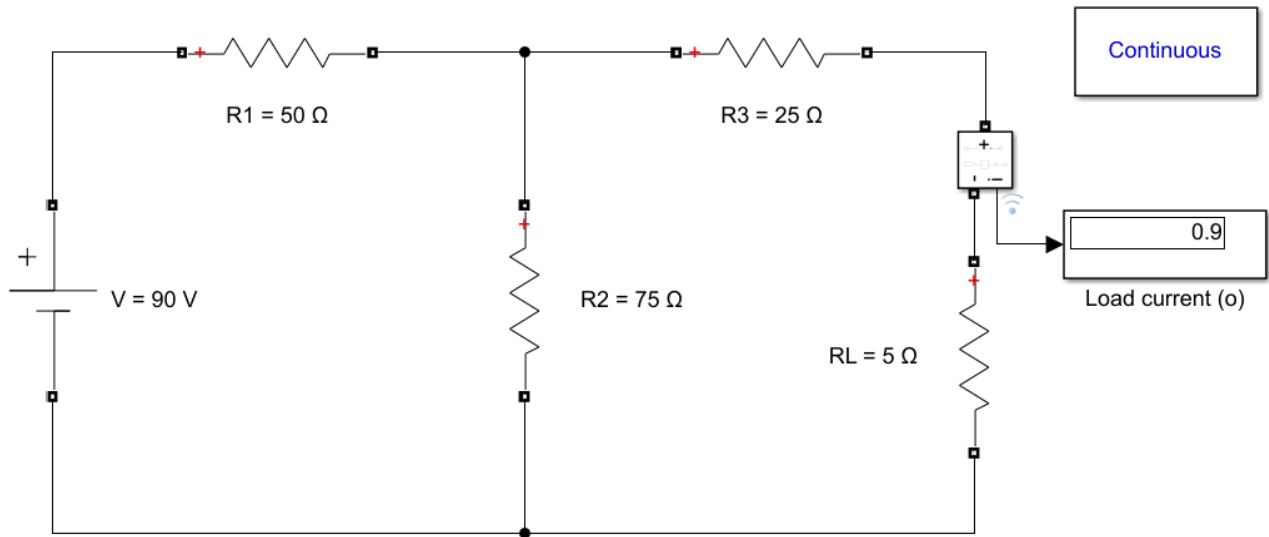
To find V_{TH}



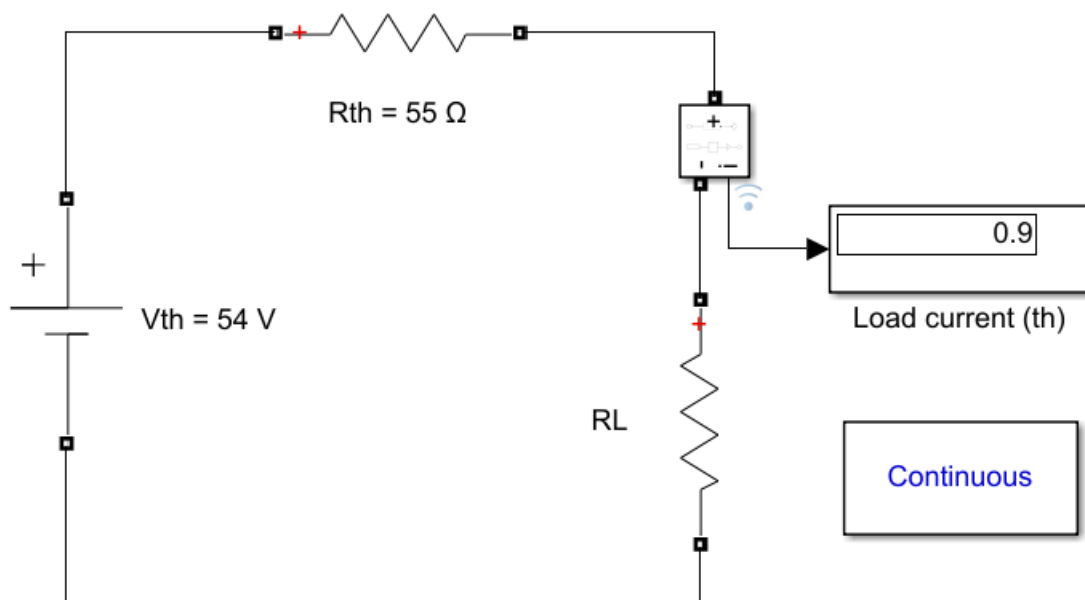
To find R_{TH}

Simulations on MATLAB-Simulink

a) The original network



b) Thevenin equivalent network



Observations

V (V)	$R_1 (\Omega)$	$R_2 (\Omega)$	$R_3 (\Omega)$	$R_L (\Omega)$
90	50	75	25	5

Calculated V_{TH}	Calculated R_{TH}
54 V	55 Ω

Simulation results

	In original network	Thevenin equivalent network
Load current (A)	0.9	0.9

Result: Thevenin theorem verified in the given DC resistive circuit by simulating original circuit and Thevenin equivalent circuit on MATLAB-Simulink platform