**Problem 2.53** If the voltage source in the circuit of Fig. P2.53 generates a single square wave with an amplitude of 2 V, generate a plot for $v_{\text{out}}$ for the same time period.

![Circuit Diagram](image)

**Figure P2.53:** Circuit and voltage waveform for Problem 2.53.

**Solution:** Current will flow through the loop only when $v_s(t)$ is greater than 0.7 V. Hence,

$$v_{\text{out}} = \begin{cases} 
2 - 0.7 = 1.3 \text{ V} & \text{for } 0 \leq t \leq T/2 \\
0 & \text{for } T/2 \leq t \leq T.
\end{cases}$$

![Plot of Voltage](image)