Consider this circuit with two ideal diodes:

Let's analyze this circuit and find $v_{D1}^i$, $i_{D1}^i$, $v_{D2}^i$, and $i_{D2}^i$!

Remember, we must accomplish each of the five steps:

**Step 1:** *ASSUME* that both D1 and D2 are “on” (might as well!).

**Step 2:** *ENFORCE* the equalities $v_{D1}^i = 0 = v_{D2}^i$, by replacing each ideal diode with a short circuit.
Step 3: ANALYZE the resulting circuit, and find $i_{D1}'$ and $i_{D2}'$.

Begin with KCL:

\[ i = i_{D1}' + i_{D2}' \]

where \[ i = \]

and \[ i_{D2}' = \]

Therefore, \[ i_{D1}' = \]
Step 4: Now we must **CHECK inequalities** to see if our assumptions are correct!

\[ i_{D1}^i = \]

\[ i_{D2}^i = \]

One assumption is therefore **INCORRECT**. We must proceed to step 5—change our assumptions and **completely** start again!

**Q:** Wait a second! We don’t have to **completely** start from the beginning, do we? After all, our assumption about diode D2 turned out to be **true**—so we **already** know that \( i_{D2}^i = \) and \( v_{D2}^i = 0 \), **right**?

**A:** **NO!** The solution for diode \( D_2 \) is dependent on the state of both diodes \( D_1 \) and \( D_2 \). If the assumption of just one diode turns out to be incorrect, then the solutions for all diodes are **wrong**!

So, let’s change our assumption and start all over again!
Step 1: Now **ASSUME** that $D_1$ is "off" and $D_2$ is "on".

Step 2: **ENFORCE** $i_{D1}^i = 0$ ($D_1$ open) and $v_{D2}^i = 0$ ($D_2$ short).

Step 3: **ANALYZE** resulting circuit, and find $v_{D1}^i$ and $i_{D2}^i$.

Note $i = i_{D2}^i = \ldots$

and from KVL:

$$\therefore v_D^i = \ldots$$
4) CHECK our assumptions.

\[ i_{D2}^i = \]

\[ v_{D1}^i = \]

\[ v_{D2}^i = 0 \quad i_{D2}^i = \]

\[ v_{D1}^i = \quad i_{D1}^i = 0 \]

\[ \therefore \text{Assumptions are correct! We are finished!} \]