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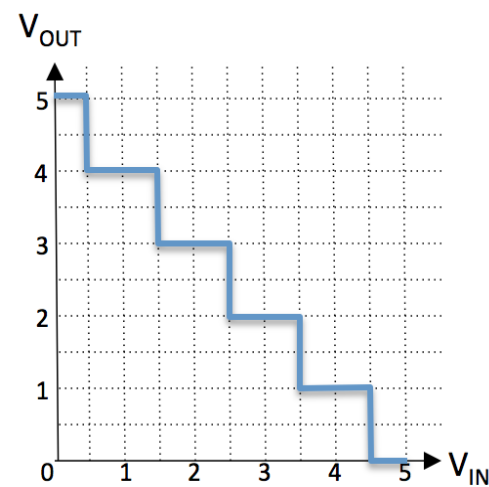
WE2.1

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The Static Discipline

3/3 points (ungraded)

Ivan Idea, a resident of Chelyabinsk who’s been watching the 6.004 videos on YouTube, was inspired to attach electrodes to opposite ends of a meteor fragment that came through his roof and produce a voltage transfer curve (VTC) of the resulting device, which is shown below.



Amazingly all the “corner points” of the VTC fall on the 0.5V grid.

Ivan is hoping he can sell his device as the world’s only extraterrestrial combinational inverter and has provided the table below suggesting possible voltage thresholds to achieve 0.3V noise margins. He’s happy to report that for any input voltage, the output voltage becomes stable within 1ns of the application of a new, stable input voltage. For each proposed specification please select “YES” if the device obeys the static discipline and “NO” if it does not.

	V_{OL}	V_{IL}	V_{IH}	V_{OH}	Obeys Static Discipline
Specification #1	0.1	0.4	4.6	4.9	<div>Yes</div>
Specification #2	0.6	0.9	4.1	4.4	<div>No</div>
Specification #3	1.1	1.4	3.6	3.9	<div>Yes</div>

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The Static Discipline

Voltage Transfer Curve

1) $V_{ol} < V_{il} \leq V_{ih} < V_{oh}$

2a) Does a valid low input ($V_{in} < V_{il}$) always produce a valid high output ($V_{out} > V_{oh}$)?

2b) Does a valid high input ($V_{in} > V_{ih}$) always produce a valid low output ($V_{out} < V_{ol}$)?

	Vol	Vil	Vih	Voh	Obeys Static Discipline
Specification #2	0.6	0.9	4.1	4.4	Yes No
Specification #3	1.1	1.4	3.6	3.9	Yes No

(Caption will be displayed when you start playing the video.)

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	Go to the notes it's better explained there https://computationstructures.org/notes/digitalabstraction/notes.html		
💬	Specification 3 : wrong solution and also wrong explanation	2	▼
	For specification 3: $V_{IL} < 1.4$ Volt, the output voltage can be 3 or 4 Volt, NOT 4 or 5, so does not comply the static discipline, becaus...		
💬	Why can $V_{il} = V_{ih}$	4	▼
	Still don't understand how you can potentially have $V_{il} = V_{ih}$. Don't you need to have a "forbidden zone" so that 0 and 1 signals are cl...		



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