

CPE 151
Digital IC Design

Project No.2

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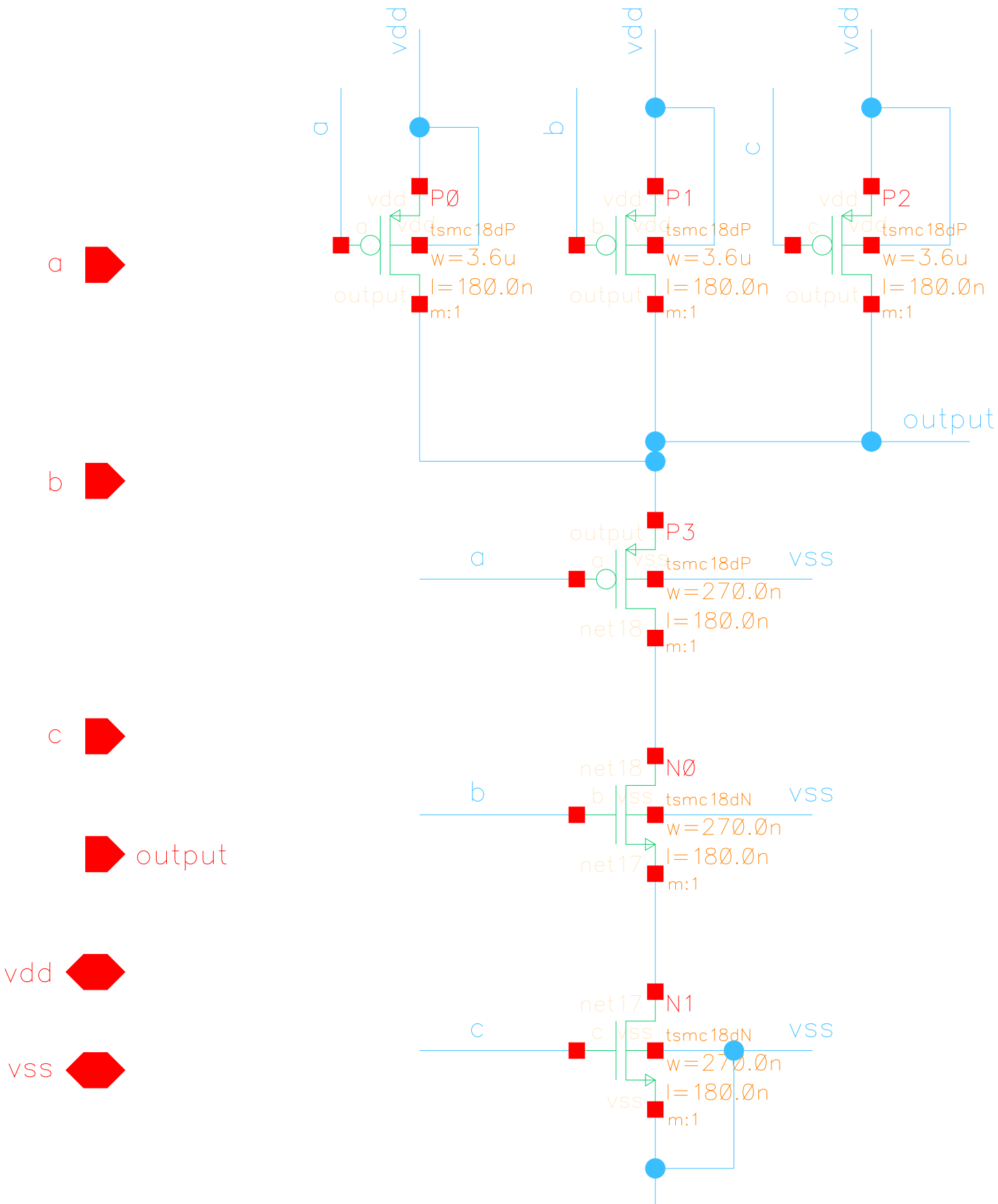
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3input NAND

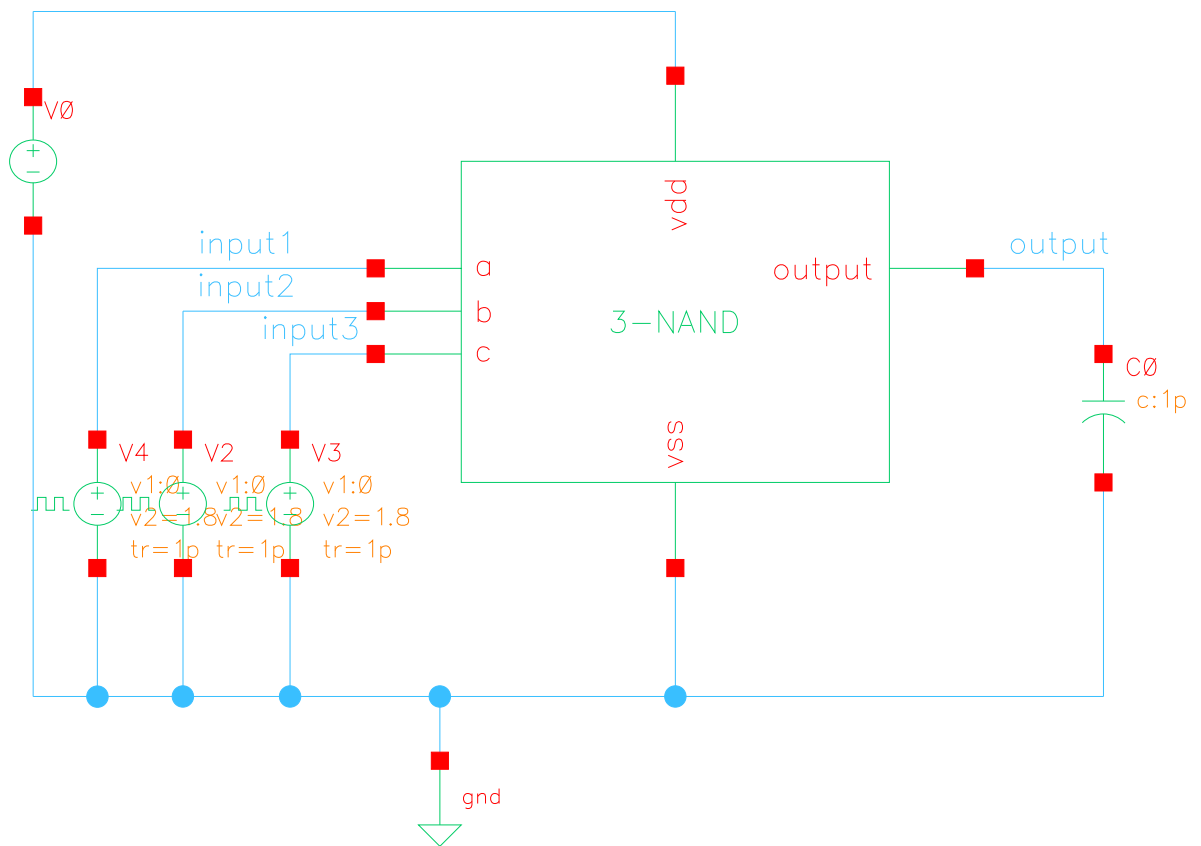
(W/L)_n = 1.8/.18

(W/L)_p=3.6/0.18

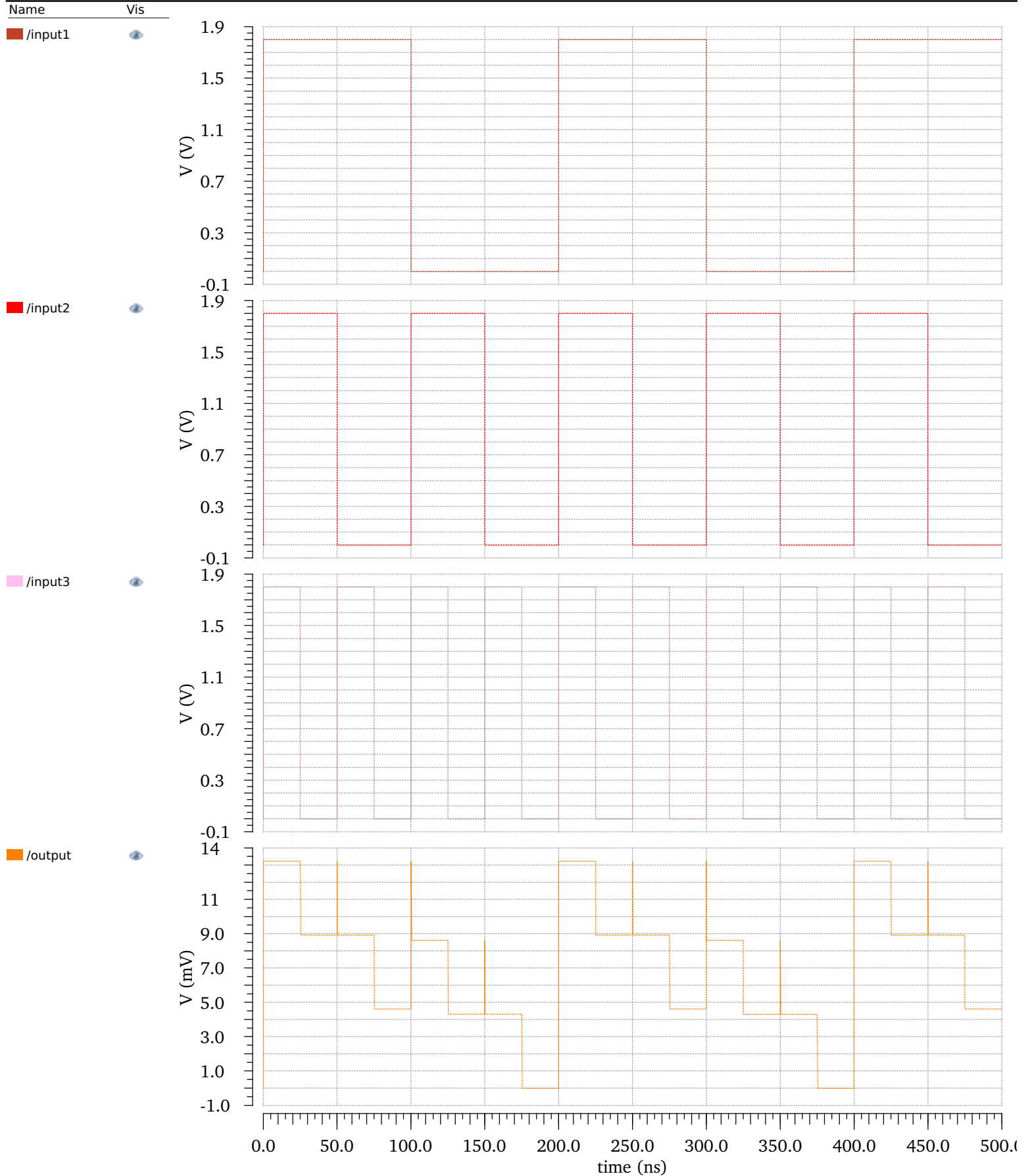
Schematic(3input NAND):



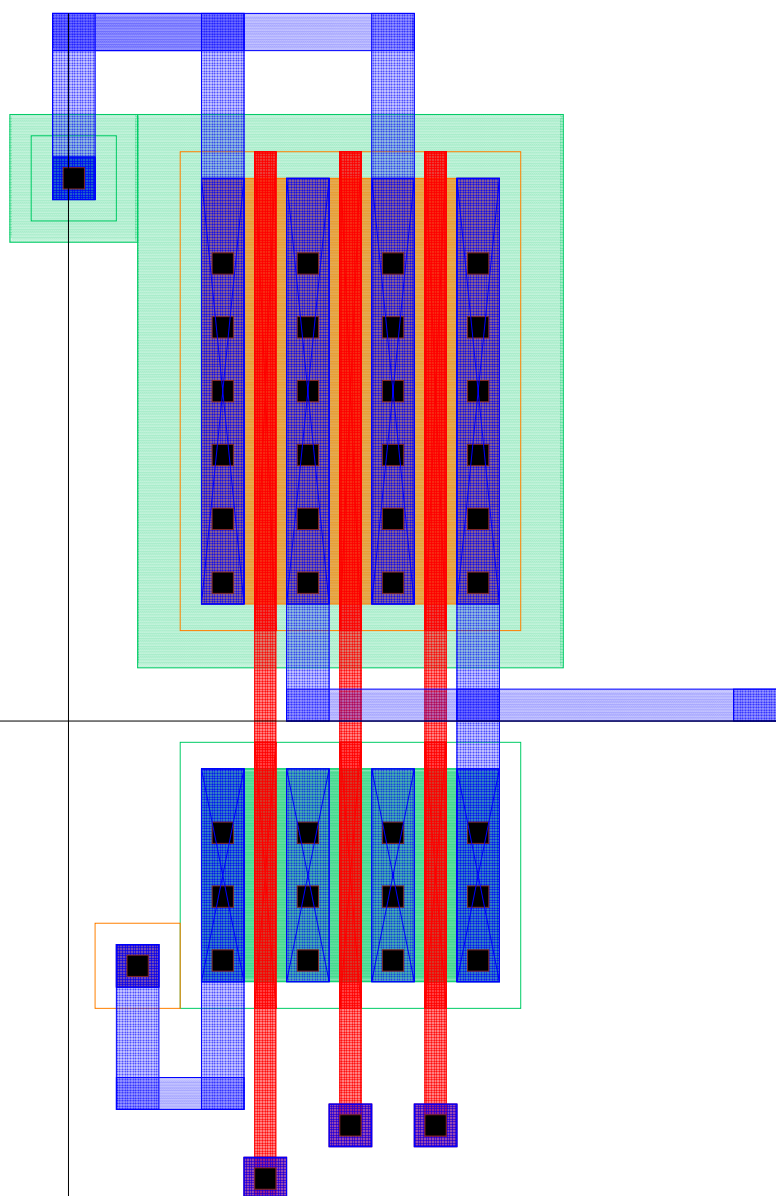
Test Bench(3input NAND):



Test Bench Waveform(3input NAND):

Transient Response**Fri Mar 27 23:09:55 2020**

Layout (3input NAND):



LVS(3input NAND):

```

1: @(#) $CDS: LVS version 6.1.7-64b 09/27/2016 19:41 (sjfhw305) $
2:
3: Command line: /software/cadence/installs/IC617/tools.lnx86/dfII/bin/64bit/LVS -dir /gaia/class/student/komacd/CadDemo/Assignment2/LVS -l -s -t /gaia/class/student/komacd/CadDemo/Assignment2/LVS/layout /gaia/class/student/komacd/CadDemo/Assignment2/LVS/schematic
4: Like matching is enabled.
5: Net swapping is enabled.
6: Using terminal names as correspondence points.
7: Compiling Diva LVS rules...
8:
9:      Net-list summary for /gaia/class/student/komacd/CadDemo/Assignment2/LVS/layout/netlist
10:      count
11:      8          nets
12:      6          terminals
13:      3          pmos
14:      3          nmos
15:
16:      Net-list summary for /gaia/class/student/komacd/CadDemo/Assignment2/LVS/schematic/netlist
17:      count
18:      8          nets
19:      6          terminals
20:      4          pmos
21:      2          nmos
22:
23:
24:      Terminal correspondence points
25:      N5      N1      a
26:      N4      N0      b
27:      N2      N5      c
28:      N6      N4      output
29:      N3      N6      vdd
30:      N7      N2      vss
31:
32: Devices in the netlist but not in the rules:
33:      pcapacitor
34: Devices in the rules but not in the netlist:
35:      cap nfet pfet nmos4 pmos4
36:
37:      Ill-defined correspondence points.
38:
39:      N6 N4 Purged because neither is a subset of the other
40:      N2 N5 Purged because neither is a subset of the other
41:      N5 N1 Purged because neither is a subset of the other
42:      N7 N2 Purged because neither is a subset of the other
43:      N4 N0 Purged because neither is a subset of the other
44:      N7 N2 Purged because neither is a subset of the other
45:
46:
47:      Device summary for layout
48:      bad total
49:      nmos      3      3
50:

```

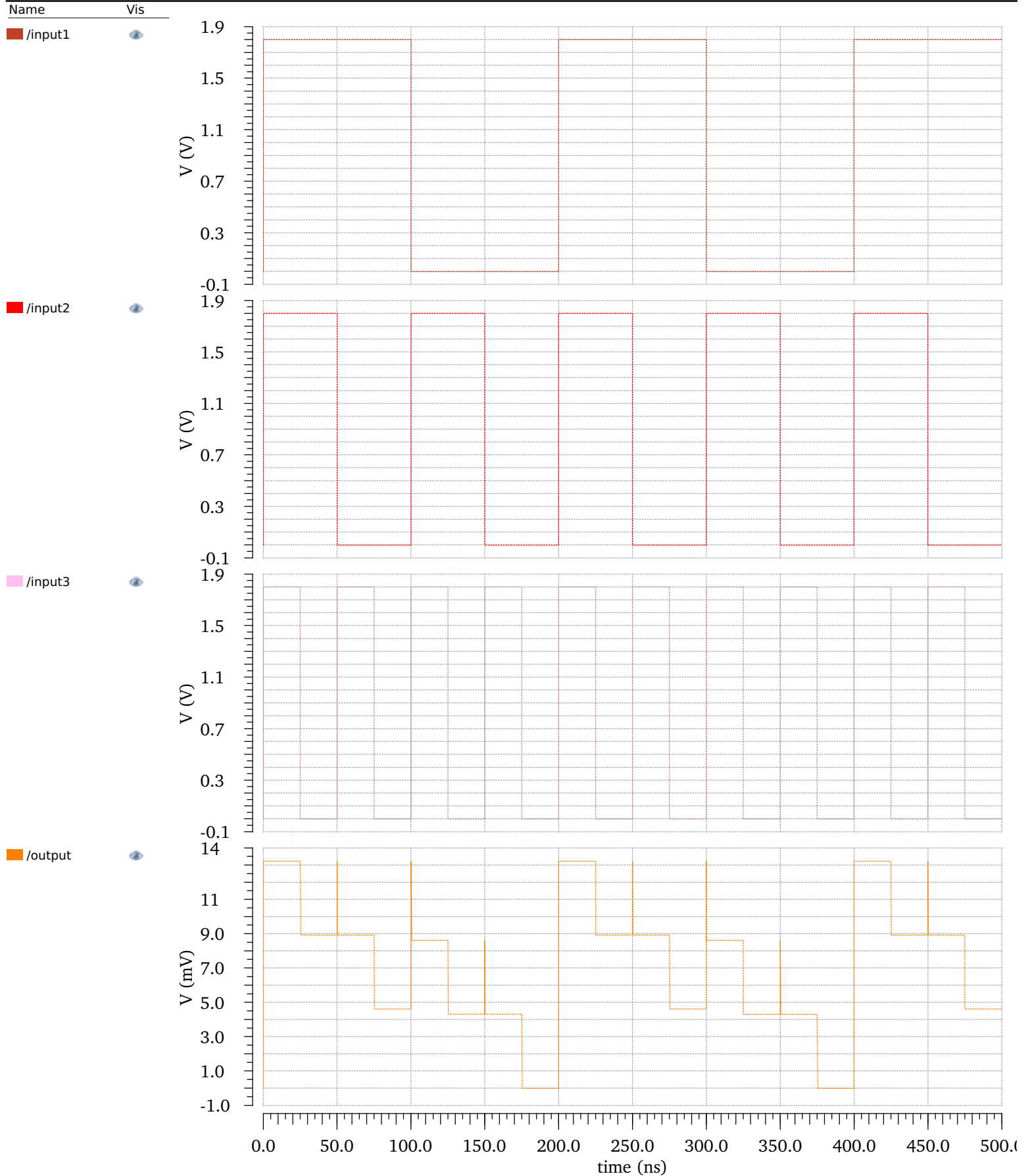
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51:
52:         Device summary for schematic
53:             bad  total
54:         pmos    1    4
55:         nmos    2    2
56:
57: 2 net-list ambiguities were resolved by random selection.
58:
59: The net-lists failed to match.
60:
61:             layout  schematic
62:             instances
63:         un-matched    3    3
64:         rewired       0    0
65:         size errors   0    0
66:         pruned        0    0
67:         active        6    6
68:         total         6    6
69:
70:             nets
71:         un-matched    3    3
72:         merged        0    0
73:         pruned        0    0
74:         active        8    8
75:         total         8    8
76:
77:             terminals
78:         un-matched    1    1
79:         matched but
80:         different type 0    0
81:         total         6    6
82:
83:
84: Probe files from /gaia/class/student/komacd/CadDemo/Assignment2/LVS/schematic
85:
86: devbad.out:
87: I /P3
88: ? Device does not cross-match.
89: I /N1
90: ? Device does not cross-match.
91: I /N0
92: ? Device does not cross-match.
93:
94: netbad.out:
95: N /net18
96: ? Net does not cross-match. It has 2 connections.
97: N /vss
98: ? Net does not cross-match. It has 4 connections.
99: N /net17
100: ? Net does not cross-match. It has 2 connections.
101:
102: mergenet.out:

```

```
103:
104: termbad.out:
105: T -1 vss /vss
106: ? Terminal vss in the schematic failed to match any terminal in the layout.
107:
108: prunenet.out:
109:
110: prunedev.out:
111:
112: audit.out:
113:
114:
115: Probe files from /gaia/class/student/komacd/CadDemo/Assignment2/LVS/layout
116:
117: devbad.out:
118: I /+0
119: ? Device does not cross-match.
120: I /+1
121: ? Device does not cross-match.
122: I /+2
123: ? Device does not cross-match.
124:
125: netbad.out:
126: N /vss
127: ? Net does not cross-match. It has 3 connections.
128: N /7
129: ? Net does not cross-match. It has 2 connections.
130: N /8
131: ? Net does not cross-match. It has 2 connections.
132:
133: mergenet.out:
134:
135: termbad.out:
136: T -1 vss /vss
137: ? Terminal vss in the layout failed to match any terminal in the schematic.
138:
139: prunenet.out:
140:
141: prunedev.out:
142:
143: audit.out:
144:
```

Post Layout-Simulation(3input NAND):

Transient Response**Fri Mar 27 23:09:55 2020**

Conclusion:

S. No.	Description	Rise Time(us)	Fall Time(us)	Delay Time(us)
1.	3input NAND	.001us	0us	0us