

Example Circuit A — Simple Circuit

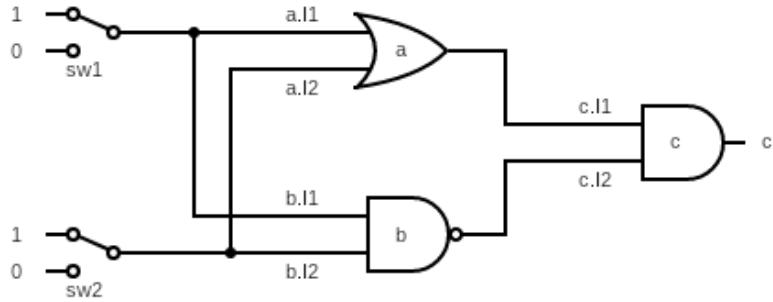


Figure 1: XOR Gate

```
1      #Example circuit - Simple circuit (As per first interim report);
2      #XOR gate;
3
4      devices(
5          a is OR;
6          b is NAND;
7          c is AND;
8          sw1, sw2 are SWITCH;
9      )
10
11     initialise(
12         sw1, sw2 are HIGH;
13         a, b, c have 2 inputs;
14     )
15
16     connections(
17         a(
18             sw1 is connected to a.I1;
19             sw2 is connected to a.I2;
20         )
21
22         b(
23             sw1 is connected to b.I1;
24             sw2 is connected to b.I2;
25         )
26
27         c(
28             a is connected to c.I1;
29             b is connected to c.I2;
30         )
31     )
32
33     monitors(
34         c;
35     )
```

Example Circuit B — Complex Circuit

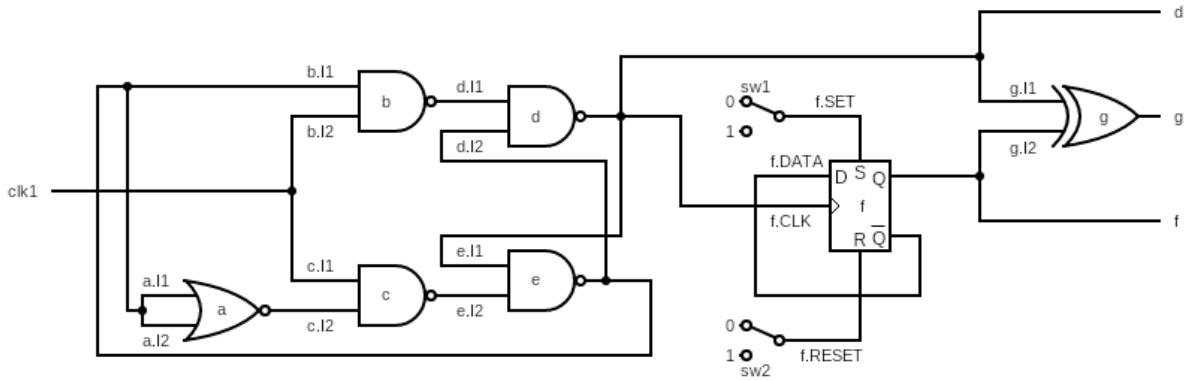


Figure 2: 2 Bit Counter with Outputs XOR

```

1      #Example circuit - Complex circuit (As per first interim report);
2      #2 bit counter with outputs XOR;
3
4      devices(
5          a is NOR;
6          b, c, d, e are NAND;
7          f is DTYPE;
8          g is XOR;
9          sw1, sw2 are SWITCH;
10         clk1 is CLOCK;
11     )
12
13     initialise(
14         a, b, c, d, e, g have 2 inputs;
15         sw1, sw2 are LOW;
16         clk1 cycle length 5;
17     )
18
19     connections(
20         a(
21             e to a.I1;
22             e to a.I2;
23         )
24
25         b(
26             e to b.I1;
27             clk1 to b.I2;
28         )
29
30         c(
31             clk1 to c.I1;

```

```

32         a to c.I2;
33     )
34
35     d(
36         b to d.I1;
37         e to d.I2;
38     )
39
40     e(
41         d to e.I1;
42         c to e.I2;
43     )
44
45     f(
46         f.QBAR to f.DATA;
47         d to f.CLK;
48         sw1 to f.SET;
49         sw2 to f.CLEAR;
50     )
51
52     g(
53         d to g.I1;
54         f.Q to g.I2;
55     )
56 )
57
58 monitors(
59     d, f.Q, g;
60 )

```

Example Circuit C — 50 Switches

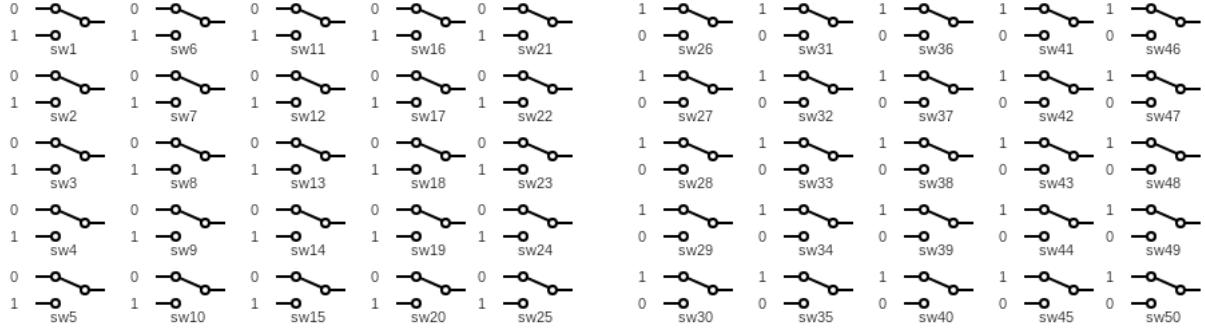


Figure 3: 50 Switches

```

1      #Example circuit - 50 switches;
2
3      devices(
4          sw1, sw2, sw3, sw4, sw5, sw6, sw7, sw8, sw9, sw10,
5          sw11, sw12, sw13, sw14, sw15, sw16, sw17, sw18, sw19, sw20,
6          sw21, sw22, sw23, sw24, sw25, sw26, sw27, sw28, sw29, sw30,
7          sw31, sw32, sw33, sw34, sw35, sw36, sw37, sw38, sw39, sw40,
8          sw41, sw42, sw43, sw44, sw45, sw46, sw47, sw48, sw49, sw50 are SWITCH;
9      )
10
11      initialise(
12          sw1, sw2, sw3, sw4, sw5, sw6, sw7, sw8, sw9, sw10,
13          sw11, sw12, sw13, sw14, sw15, sw16, sw17, sw18, sw19, sw20,
14          sw21, sw22, sw23, sw24, sw25 are LOW;
15          sw26, sw27, sw28, sw29, sw30, sw31, sw32, sw33, sw34, sw35,
16          sw36, sw37, sw38, sw39, sw40, sw41, sw42, sw43, sw44, sw45,
17          sw46, sw47, sw48, sw49, sw50 are HIGH;
18      )
19
20      connections(
21      )
22
23      monitors(
24          sw1, sw2, sw3, sw4, sw5, sw6, sw7, sw8, sw9, sw10,
25          sw11, sw12, sw13, sw14, sw15, sw16, sw17, sw18, sw19, sw20,
26          sw21, sw22, sw23, sw24, sw25, sw26, sw27, sw28, sw29, sw30,
27          sw31, sw32, sw33, sw34, sw35, sw36, sw37, sw38, sw39, sw40,
28          sw41, sw42, sw43, sw44, sw45, sw46, sw47, sw48, sw49, sw50;
29      )
30

```

Example Circuit D — SR Bistable

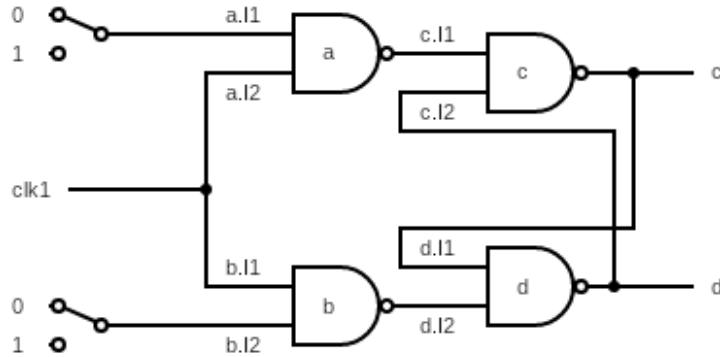


Figure 4: SR Bistable

```

1      #Example circuit - SR bistable;
2
3      devices(
4          a, b, c, d are NAND;
5          sw1, sw2 are SWITCH;
6          clk1 is CLOCK;
7      )
8
9      initialise(
10         sw1, sw2 are LOW;
11         a, b, c, d have 2 inputs;
12         clk1 cycle 5;
13     )
14
15      connections(
16          a(
17              sw1 to a.I1;
18              clk1 to a.I2;
19          )
20
21          b(
22              clk1 to b.I1;
23              sw2 to b.I2;
24          )
25
26          c(
27              a to c.I1;
28              d to c.I2;
29          )
30
31          d(
32              c to d.I1;

```

```
33         b to d.I2;
34     )
35   )
36
37 monitors(
38   c, d;
39 )
```

Example Circuit E — Divide by 3 Circuit

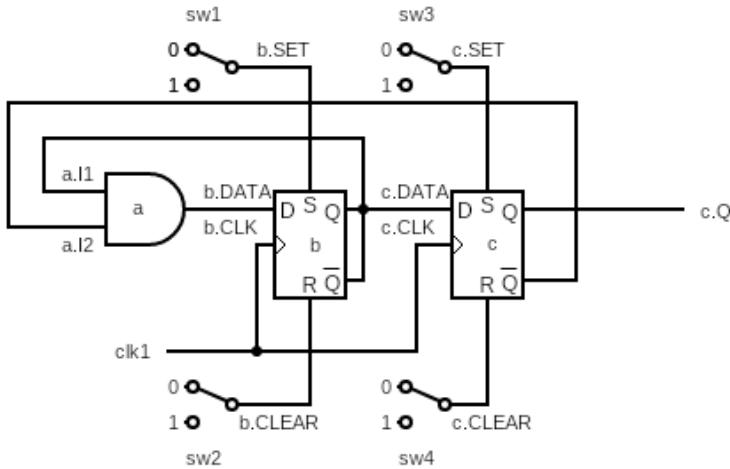


Figure 5: Divide by 3 Circuit

```

1      #Example circuit - divide (clock frequency) by 3;
2
3      devices(
4          a is AND;
5          b, c are DTYPE;
6          sw1, sw2, sw3, sw4 are SWITCH;
7          clk1 is CLOCK;
8      )
9
10     initialise(
11         a has 2 inputs;
12         sw1, sw2, sw3, sw4 are LOW;
13         clk1 cycle 9;
14     )
15
16     connections(
17         a(
18             b.QBAR to a.I1;
19             c.QBAR to a.I2;
20         )
21
22         b(
23             a to b.DATA;
24             clk1 to b.CLK;
25             sw1 to b.SET;
26             sw2 to b.CLEAR;
27         )
28
29         c(

```

```
30      b.Q to c.DATA;
31      clk1 to c.CLK;
32      sw3 to c.SET;
33      sw4 to c.CLEAR;
34  )
35  )
36 monitors(
37   c.Q;
38 )
39 )
```

Example Circuit F — Ring Oscillator

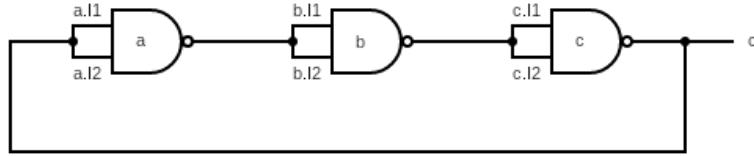


Figure 6: Ring Oscillator

```
1 #Example circuit - Ring Oscillator;
2
3 devices(
4     a, b, c are NAND;
5 )
6
7 initialise(
8     a, b, c have 2 inputs;
9 )
10
11 connections(
12     a(
13         c to a.I1;
14         c to a.I2;
15     )
16
17     b(
18         a to b.I1;
19         a to b.I2;
20     )
21
22     c(
23         b to c.I1;
24         b to c.I2;
25     )
26 )
27
28 monitors(
29     c;
30 )
```

Note that this circuit will not be able to be simulated as it involves oscillating signals.

Example Circuit G — Blank Circuit

```
1      #Example circuit - Blank circuit;
2
3      devices(
4      )
5
6      initialise(
7      )
8
9      connections(
10     )
11
12     monitors(
13     )
```

Alternatively, a blank .txt file will also suffice