Example Circuit A — Simple Circuit

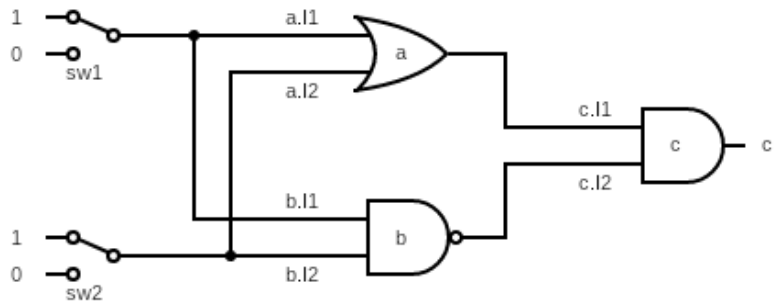

Figure 1: XOR Gate

```
#Example circuit - Simple circuit (As per first interim report);
#XOR gate;

devices(
    a is OR;
    b is NAND;
    c is AND;
    sw1, sw2 are SWITCH;
)

initialise(
    sw1, sw2 are HIGH;
    a, b, c have 2 inputs;
)

connections(
    a(
        sw1 is connected to a.I1;
        sw2 is connected to a.I2;
    )

    b(
        sw1 is connected to b.I1;
        sw2 is connected to b.I2;
    )

    c(
        a is connected to c.I1;
        b is connected to c.I2;
    )
)

monitors(
    c;
)
```

Example Circuit B — Complex Circuit

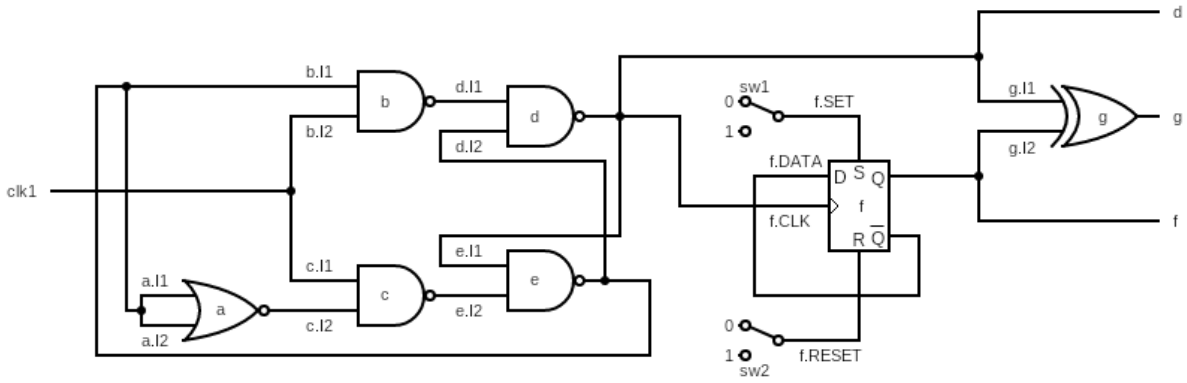

Figure 2: 2 Bit Counter with Outputs XOR

```
#Example circuit - Complex circuit (As per first interim report);
#2 bit counter with outputs XOR;

devices(
    a is NOR;
    b, c, d, e are NAND;
    f is DTYPE;
    g is XOR;
    sw1, sw2 are SWITCH;
    clk1 is CLOCK;
)

initialise(
    a, b, c, d, e, g have 2 inputs;
    sw1, sw2 are LOW;
    clk1 cycle length 5;
)

connections(
    a(
        e to a.I1;
        e to a.I2;
    )

    b(
        e to b.I1;
        clk1 to b.I2;
    )

    c(
        clk1 to c.I1;
```

```
            a to c.I2;
        )

        d(
            b to d.I1;
            e to d.I2;
        )

        e(
            d to e.I1;
            c to e.I2;
        )

        f(
            f.QBAR to f.DATA;
            d to f.CLK;
            sw1 to f.SET;
            sw2 to f.CLEAR;
        )

        g(
            d to g.I1;
            f.Q to g.I2;
        )
    )

    monitors(
        d, f.Q, g;
    )
```

Example Circuit C — 50 Switches

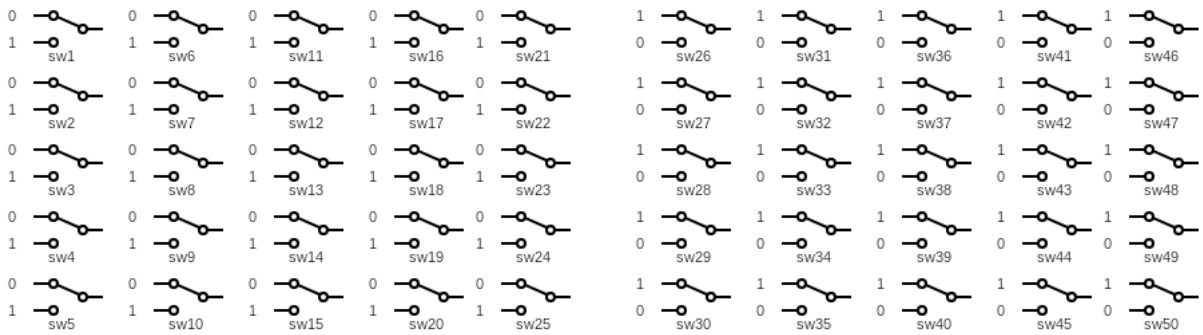

Figure 3: 50 Switches

```
#Example circuit - 50 switches;

devices(
    sw1, sw2, sw3, sw4, sw5, sw6, sw7, sw8, sw9, sw10,
    sw11, sw12, sw13, sw14, sw15, sw16, sw17, sw18, sw19, sw20,
    sw21, sw22, sw23, sw24, sw25, sw26, sw27, sw28, sw29, sw30,
    sw31, sw32, sw33, sw34, sw35, sw36, sw37, sw38, sw39, sw40,
    sw41, sw42, sw43, sw44, sw45, sw46, sw47, sw48, sw49, sw50 are SWITCH;
)

initialise(
    sw1, sw2, sw3, sw4, sw5, sw6, sw7, sw8, sw9, sw10,
    sw11, sw12, sw13, sw14, sw15, sw16, sw17, sw18, sw19, sw20,
    sw21, sw22, sw23, sw24, sw25 are LOW;
    sw26, sw27, sw28, sw29, sw30, sw31, sw32, sw33, sw34, sw35,
    sw36, sw37, sw38, sw39, sw40, sw41, sw42, sw43, sw44, sw45,
    sw46, sw47, sw48, sw49, sw50 are HIGH;
)

connections(
)

monitors(
    sw1, sw2, sw3, sw4, sw5, sw6, sw7, sw8, sw9, sw10,
    sw11, sw12, sw13, sw14, sw15, sw16, sw17, sw18, sw19, sw20,
    sw21, sw22, sw23, sw24, sw25, sw26, sw27, sw28, sw29, sw30,
    sw31, sw32, sw33, sw34, sw35, sw36, sw37, sw38, sw39, sw40,
    sw41, sw42, sw43, sw44, sw45, sw46, sw47, sw48, sw49, sw50;
)

```

Example Circuit D — SR Bistable

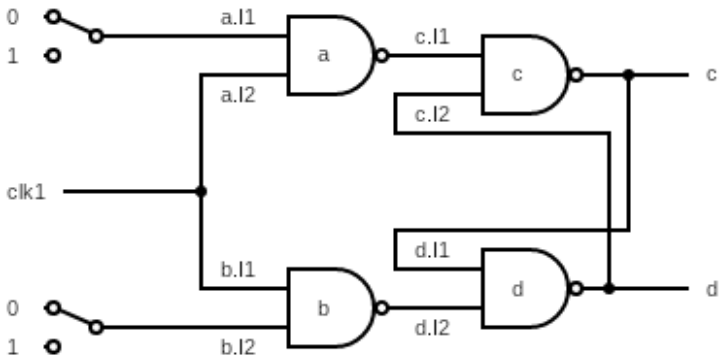

Figure 4: SR Bistable

```
#Example circuit - SR bistable;

devices(
    a, b, c, d are NAND;
    sw1, sw2 are SWITCH;
    clk1 is CLOCK;
)

initialise(
    sw1, sw2 are LOW;
    a, b, c, d have 2 inputs;
    clk1 cycle 5;
)

connections(
    a(
        sw1 to a.I1;
        clk1 to a.I2;
    )

    b(
        clk1 to b.I1;
        sw2 to b.I2;
    )

    c(
        a to c.I1;
        d to c.I2;
    )

    d(
        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

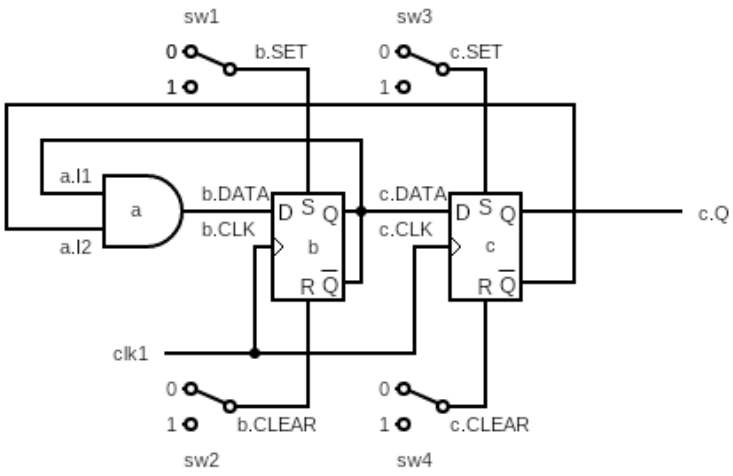

Figure 5: Divide by 3 Circuit

```
#Example circuit - divide (clock frequency) by 3;

devices(
    a is AND;
    b, c are DTYPE;
    sw1, sw2, sw3, sw4 are SWITCH;
    clk1 is CLOCK;
)

initialise(
    a has 2 inputs;
    sw1, sw2, sw3, sw4 are LOW;
    clk1 cycle 9;
)

connections(
    a(
        b.QBAR to a.I1;
        c.QBAR to a.I2;
    )

    b(
        a to b.DATA;
        clk1 to b.CLK;
        sw1 to b.SET;
        sw2 to b.CLEAR;
    )

    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
37      monitors(
38          c.Q;
39      )
```

Example Circuit F — Ring Oscillator

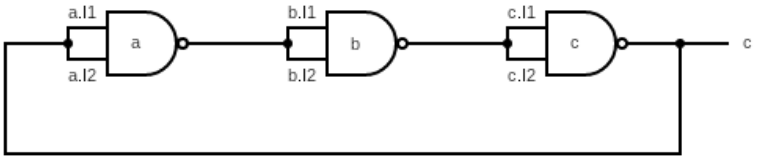

Figure 6: Ring Oscillator

```
#Example circuit - Ring Oscillator;

devices(
    a, b, c are NAND;
)

initialise(
    a, b, c have 2 inputs;
)

connections(
    a(
        c to a.I1;
        c to a.I2;
    )

    b(
        a to b.I1;
        a to b.I2;
    )

    c(
        b to c.I1;
        b to c.I2;
    )
)

monitors(
    c;
)
```

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

Example Circuit G — Blank Circuit

```
#Example circuit - Blank circuit;

devices(
)

initialise(
)

connections(
)

monitors(
)
```

Alternatively, a blank .txt file will also suffice