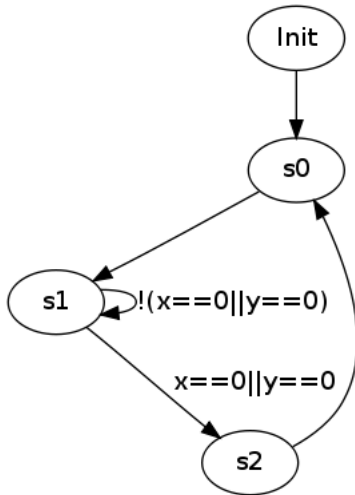


1 Part 1

1.1 Model

Figure represents the Kripke structure.



1.2 Formulas

Formulas tested:

Passed formulas:

- $EG(\neg(state = s2))$
- $EX(state = s1)$

Failed formulas:

- $E(state = s1 U state = s2)$
- $E(y = 0 * state = s2)$

2 Part 2

2.1 Question 1

```
EF(position[0:1]=0);
EF(position[0:1]=1);
EF(position[0:1]=2);
EF(position[0:1]=3);
```

2.2 Question 2

```
module elevator(position, clk, button0, button1, button2, button3);
    input clk;
    input button0, button1, button2, button3;
    output position;
    reg [1:0] position;
    reg [3:0] pressed;
    initial begin
        position = 0;
        pressed = 4;
    end

    always @(posedge clk) begin
```

```

pressed=button0+button1+button2+button3; //create this reg so we can use in CTL

        if (button0) begin
            if (position == 0)
                pressed = 4;
            else if (position > 0)
                position = position - 1;
        end

        if (button1) begin
            if (position == 1)
                pressed = 4;
            else if (position < 1)
                position = position + 1;
            else if (position > 1)
                position = position - 1;
        end

        if (button2) begin
            if (position == 2)
                pressed = 4;
            else if (position < 2)
                position = position + 1;
            else if (position > 2)
                position = position - 1;
        end

        if (button3) begin
            if (position == 3)
                pressed = 4;
            else if (position < 3)
                position = position + 1;
        end

    end
endmodule

```

2.3 Question 3

//No idea, chain the state (related the current state with the previous one) without modify the code at this point :-S

2.4 Question 4

$EF(pressed[2:0] = 2 * position[0:1] = 2);$