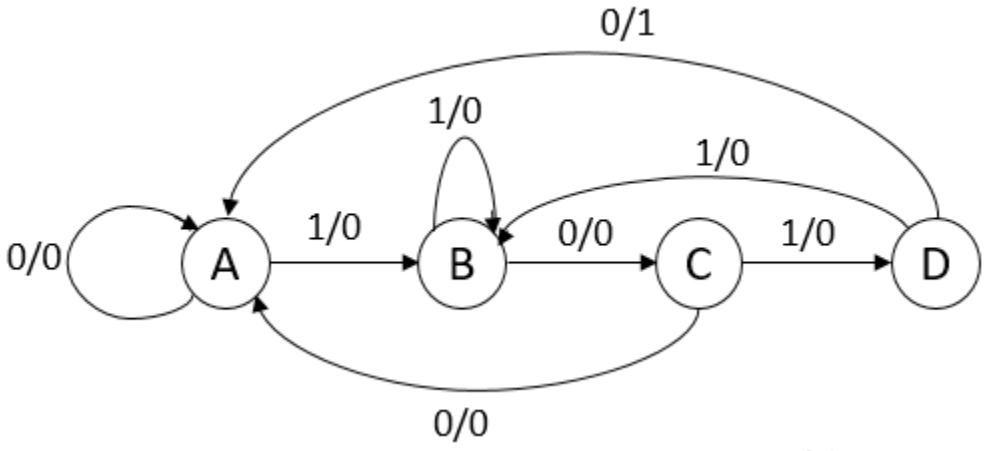
SEQUENCE DETECTOR



DESIGN:

```
module seq_detector_1010(input bit clk, rst_n, x, output z);
  parameter A = 4'h1;
  parameter B = 4'h2;
  parameter C = 4'h3;
  parameter D = 4'h4;

  bit [3:0] state, next_state;
  always @(posedge clk or negedge rst_n) begin
    if(!rst_n) begin
      state <= A;
    end
    else state <= next_state;
  end

  always @(state or x) begin
    case(state)
```

```
      A: begin
           if(x == 0) next_state = A;
           else       next_state = B;
         end
      B: begin
           if(x == 0) next_state = C;
           else       next_state = B;
         end
      C: begin
           if(x == 0) next_state = A;
           else       next_state = D;
         end
      D: begin
        if(x == 0) next_state = A;
           else       next_state = B;
         end
      default: next_state = A;
    endcase
  end
  assign z = (state == D) && (x == 0)? 1:0;
Endmodule
```

TESTBENCH:

```
module TB;
  reg clk, rst_n, x;
  wire z;
```

```
seq_detector_1010 sd(clk, rst_n, x, z);
initial clk = 0;
always #2 clk = ~clk;

initial begin
  x = 0;
  #1 rst_n = 0;
  #2 rst_n = 1;

  #3 x = 1;
  #4 x = 1;
  #4 x = 0;
  #4 x = 1;
  #4 x = 0;
  #4 x = 1;
  #4 x = 0;
  #4 x = 1;
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  #4 x = 0;
  #4 x = 1;
  #4 x = 0;
  #4 x = 1;
  #4 x = 0;
  #10;
  $finish;
end
```
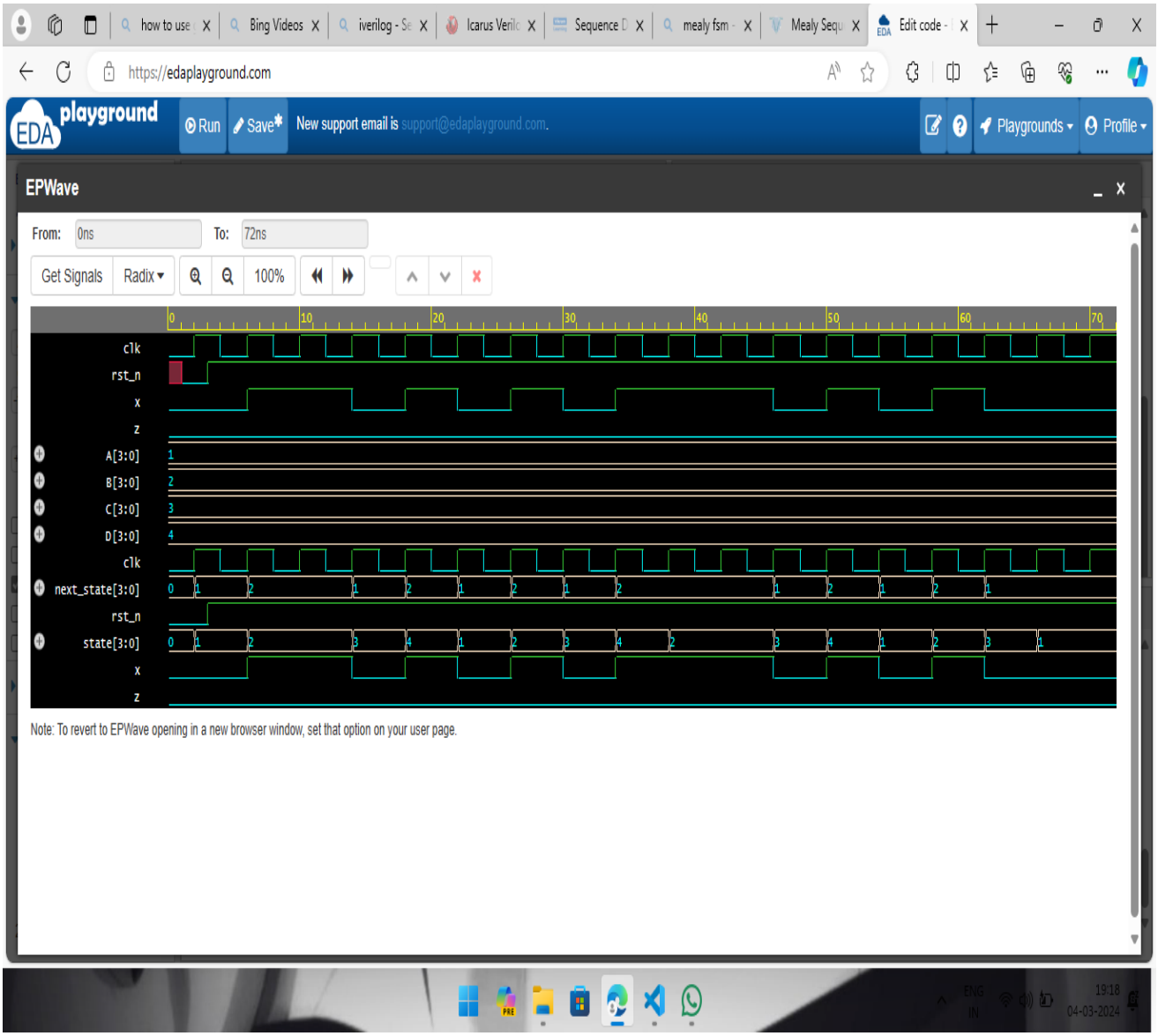

```
  initial begin
    // Dump waves
    $dumpfile("dump.vcd");
    $dumpvars(0);
  end
Endmodule
```

OUTPUT WAVEFORMS(SCREEN SHOTS):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Edit code -
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Run
Save*
New support email is support@edaplayground.com.
Playgrounds
Profile
EPWave
From: 0ns
To: 72ns
Get Signals
Radix
100%
clk
rst_n
x
z
A[3:0]
B[3:0]
C[3:0]
D[3:0]
clk
next_state[3:0]
rst_n
state[3:0]
x
z
Note: To revert to EPWave opening in a new browser window, set that option on your user page.