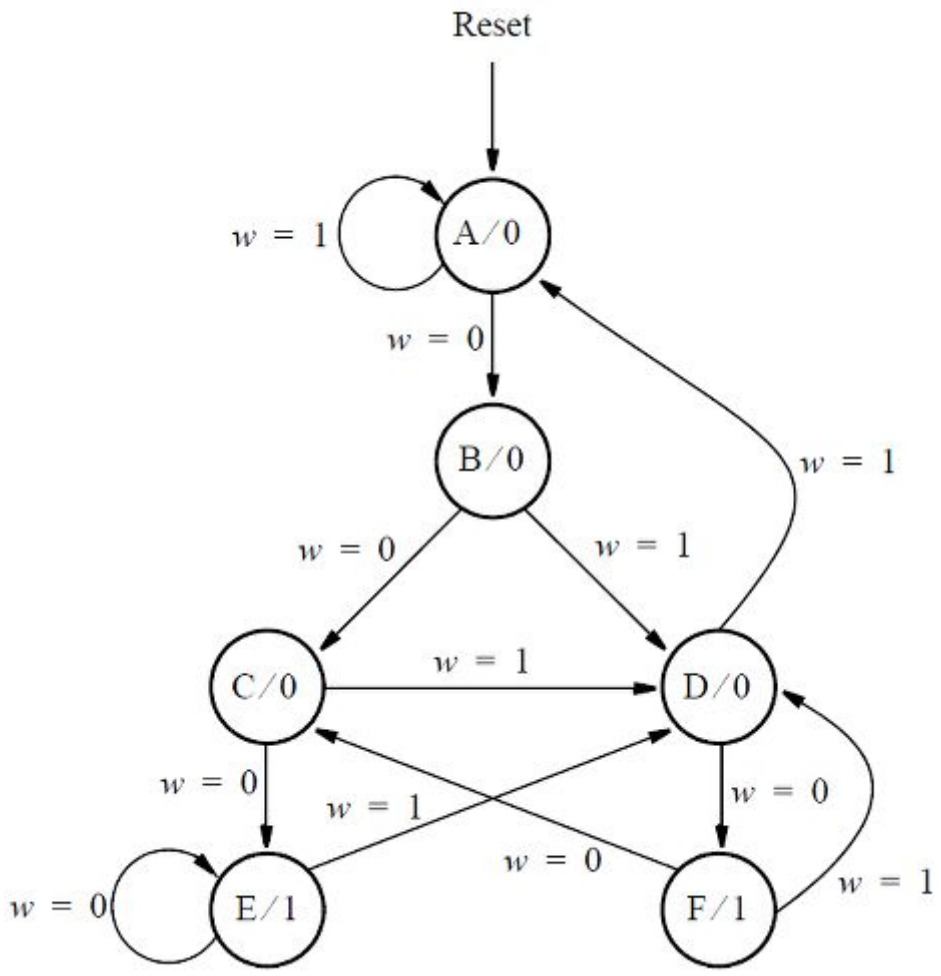
Exams/m2014 q6c

Consider the state machine shown below, which has one input *w* and one output *z*.



For this part, assume that a one-hot code is used with the state assignment 'y[6:1] = *000001, 000010, 000100, 001000, 010000, 100000 for states A, B,..., F, respectively*.

Write a logic expression for the next-state signals Y2 and Y4. (Derive the logic equations by inspection assuming a one-hot encoding. The testbench will test with non-one hot inputs to make sure you're not trying to do something more complicated).

這題蠻單純的，因為是one-hot所以很容易在state machine上觀察跳動
題目裡要
找Y2也就是next state為B，總共只有一個箭頭會跳進B, 條件是current state A 且收到 w=0
找Y4也就是next state為D，從current state {B C E F}收到w=1之後可以跳進D
把這幾個bit的相對位置找出來寫一寫簡單邏輯就成功了。

```
module top_module (
    input [6:1] y,
    input w,
    output Y2,
    output Y4);
```

```
//Y2=B: 1 arrow points to state_B: CurrStateA with w=0
//Y4=D: 4 arrow points to state_D: CurrState= {B C E F} with w=1
//            B=y2       y4=D
//  curr     w=0  w=1    w=0  w=1
//------------------------------
//A 000001    x    x     x
//B 000010    Y    x     x    Y
//C 000100    x    x     x    Y
//D 001000    x    x     x
//E 010000    x    x     x    Y
//F 100000    x    x     x    Y

    assign Y2 = ~w & y[1];
    assign Y4 =  w & (y[2]|y[3]|y[5]|y[6]);


endmodule
```