Security_project

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Agenda

- The main idea of the project.
- The main Blocks in the project.
- Quick explanation of the all blocks.
- The explanation and simulation of each block.
- The simulation of the whole project.

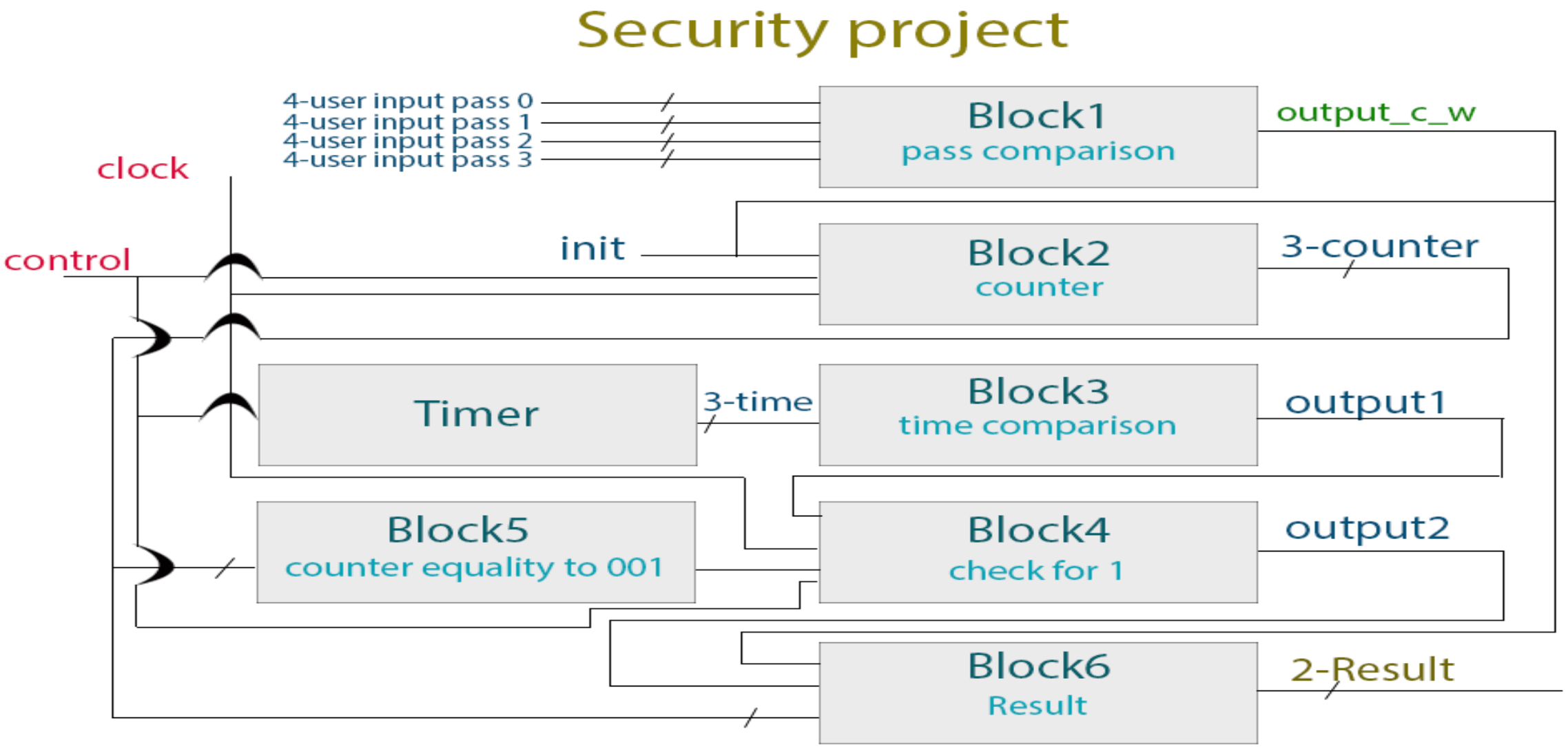
The main idea of the project

- The main idea is the same as the idea of protection in FACEBOOK. In FACEBOOK, when the user enters the incorrect password for six times for example, FACEBOOK can detect if the user is a person or a robot, but how?
- FACEBOOK suggests that it is a robot guessing the password as it calculates the time between each password the user enter. If this time is less than 0.5 sec for example, it is a robot else it's a person.
- This project also detects if the user is a person or a robot using the same principle.

It also has some other advantages:

- **It can delay time for example, for 10 sec as in the mobile or any device.**
- **It has multi-password for each user.**

The main Blocks in the project



Quick explanation of the all blocks

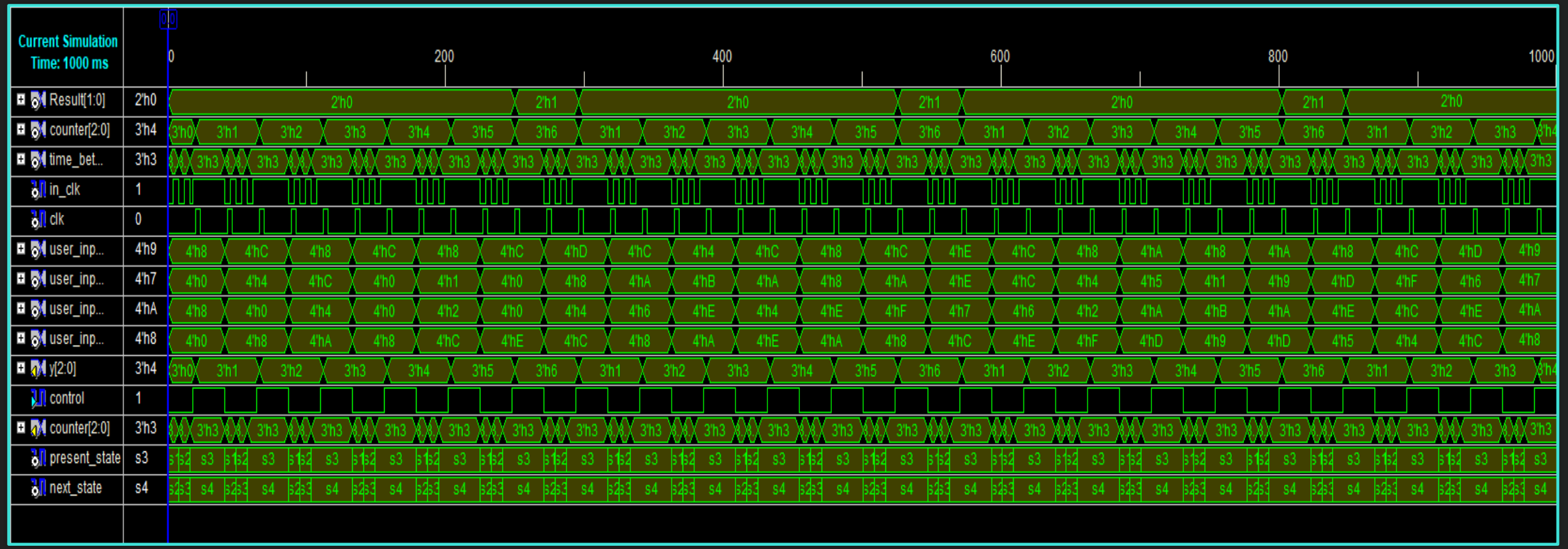
- When the user enters the password for the first time incorrectly and presses enter that is represented in control, Block1's output, called output_c_w, will be 0.
- Block2 begins counting and the counter will be 001.
- Block3 compares the number of cycles obtained from timer to 101 and if this number is equal to 101, output1 will be 1 and that means he is human who entered this password else output1 will be 0 that means it's a robot which entered this password.
- Block4 gets the signal output1 form block3 and check it, if it is 0 in all 6 times that the user entered the password in, output2 will be 0. and if output1 is 1 in one time at least from the six times of trial, the output2 from block4 will be 1
- Block6 is the final block which introduces the final result when the user enters the password incorrectly for 6 times, Block6 see output2 if output2 is 1, the result will be 10 and that means he is person who entered these six passwords and if otput2 is 0, the result will be 01 that means it's a robot which entered these passwords. And if the password is correct in one time, result will be 11 that means that the user enters the correct password

Quick explanation of the all blocks

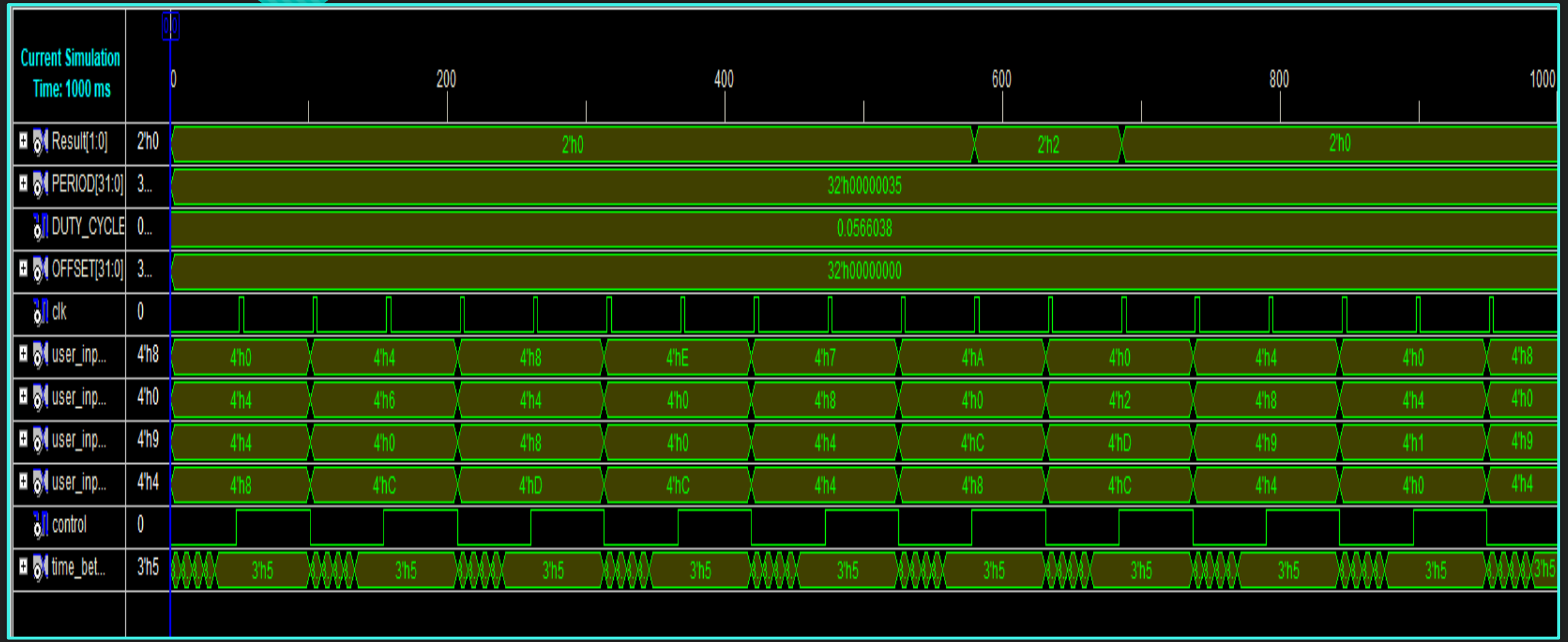
- Block6 must decide that it's a robot or a human who entered these six passwords after 6 times of entering the passwords. So, there must be block2 which counts the number of the passwords entered.

Result	meaning
01	Robot
10	Human
11	Correct password

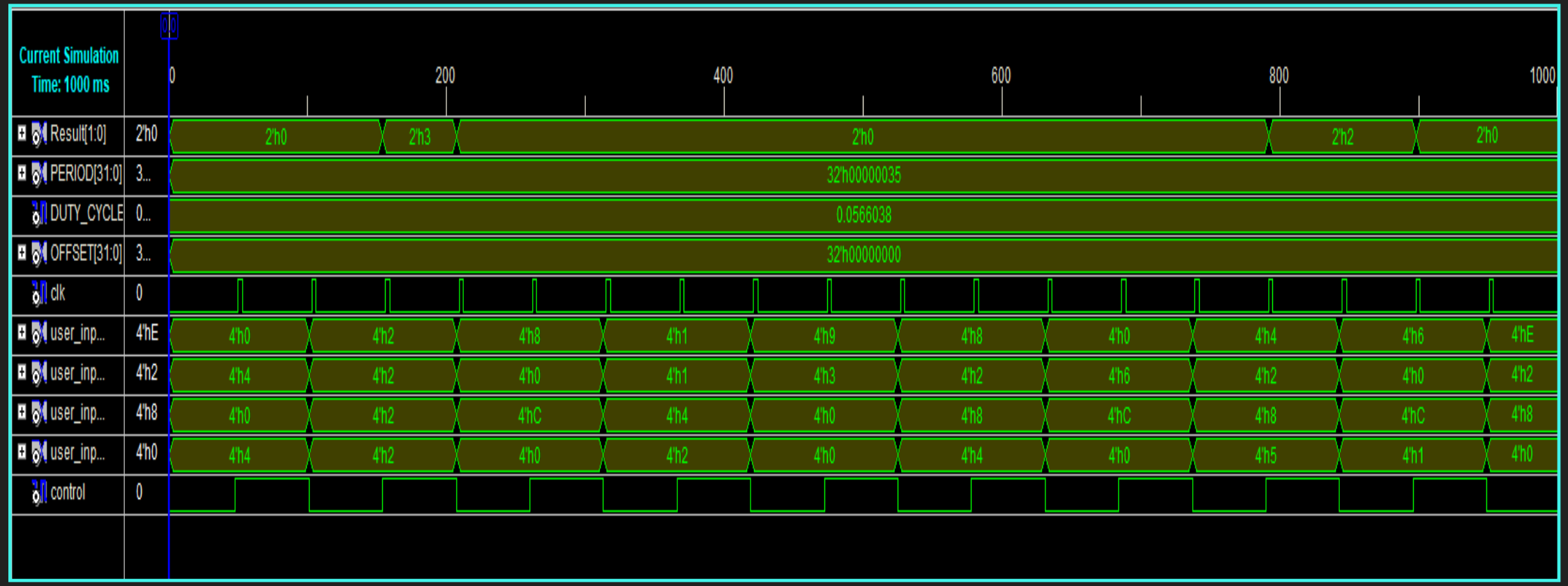
The simulation of the whole project when robot enters the passwords



The simulation of the whole project when human enters the passwords



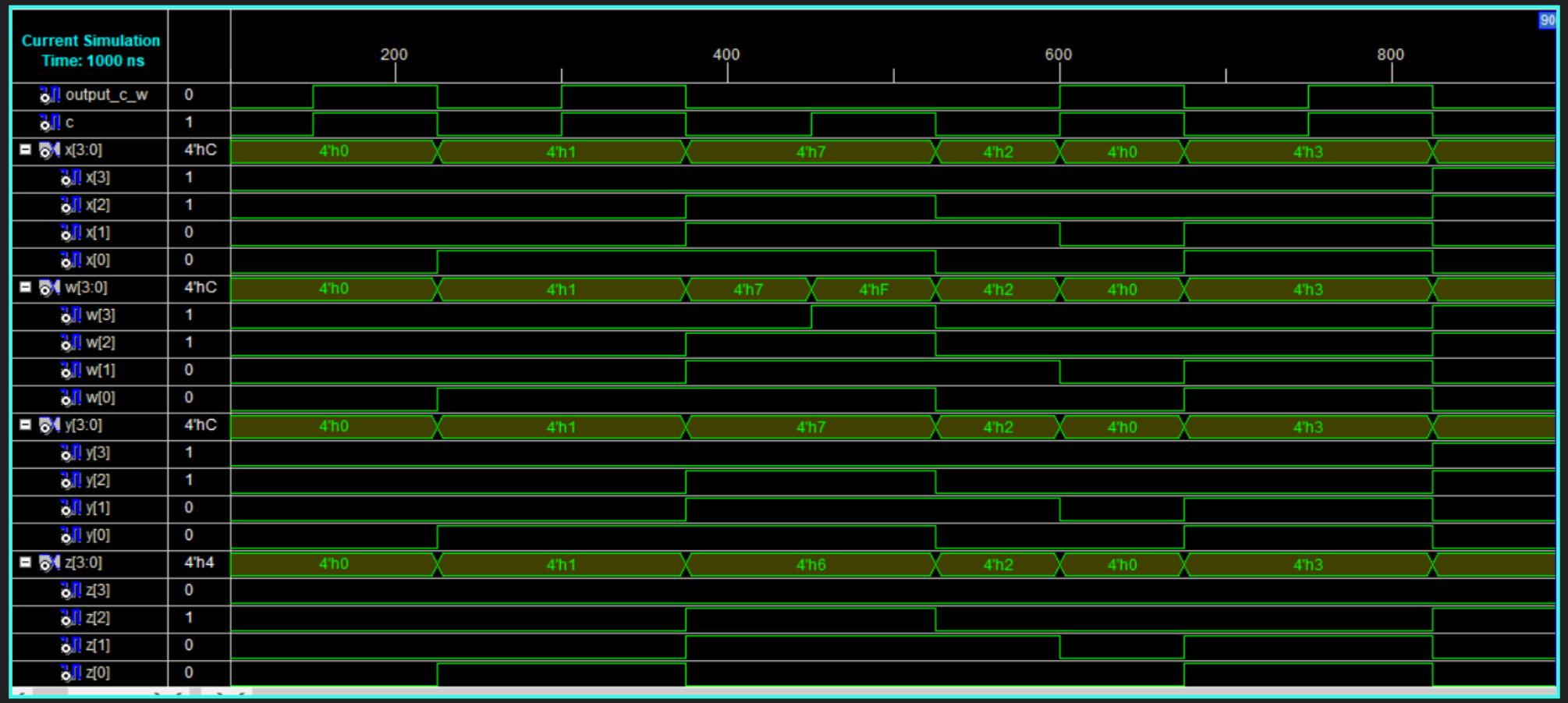
The simulation of the whole project when the user enters the correct password



Block1

- Block 1 is called pass comparison.
- It determine if the inter password is correct or no.
- the inputs for block1 are the user and control.
- When the user write the password consisting of four decimal digits (***16 bit of BCD***) and press on control then this block start comparing between the stored password and the password that the user entered.
- Stored password is stored in a Rom and this rom consists of arrays, each array has 16 digit, and each array has one stored password .
- If the password, you entered, is correct output_c_w =1.
- Else output_c_w =0 ,then it will allow you to enter the password again and then repeat the same steps.

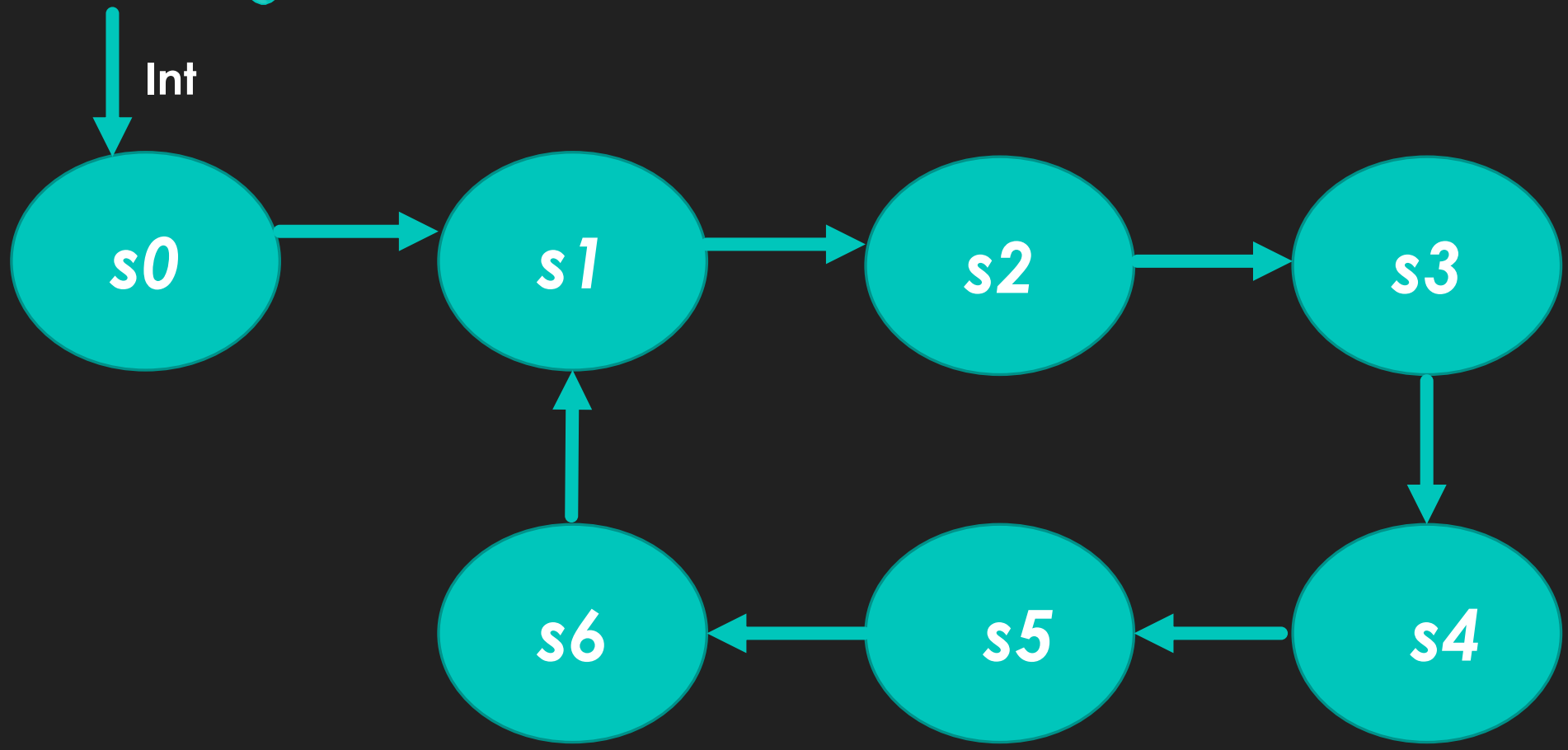
Simulation


Current Simulation Time: 1000 ns
200
400
600
800
output_c_w 0
c 1
x[3:0] 4'hC 4'h0 4'h1 4'h7 4'h2 4'h0 4'h3
x[3] 1
x[2] 1
x[1] 0
x[0] 0
w[3:0] 4'hC 4'h0 4'h1 4'h7 4'hF 4'h2 4'h0 4'h3
w[3] 1
w[2] 1
w[1] 0
w[0] 0
y[3:0] 4'hC 4'h0 4'h1 4'h7 4'h2 4'h0 4'h3
y[3] 1
y[2] 1
y[1] 0
y[0] 0
z[3:0] 4'h4 4'h0 4'h1 4'h6 4'h2 4'h0 4'h3
z[3] 0
z[2] 1
z[1] 0
z[0] 0

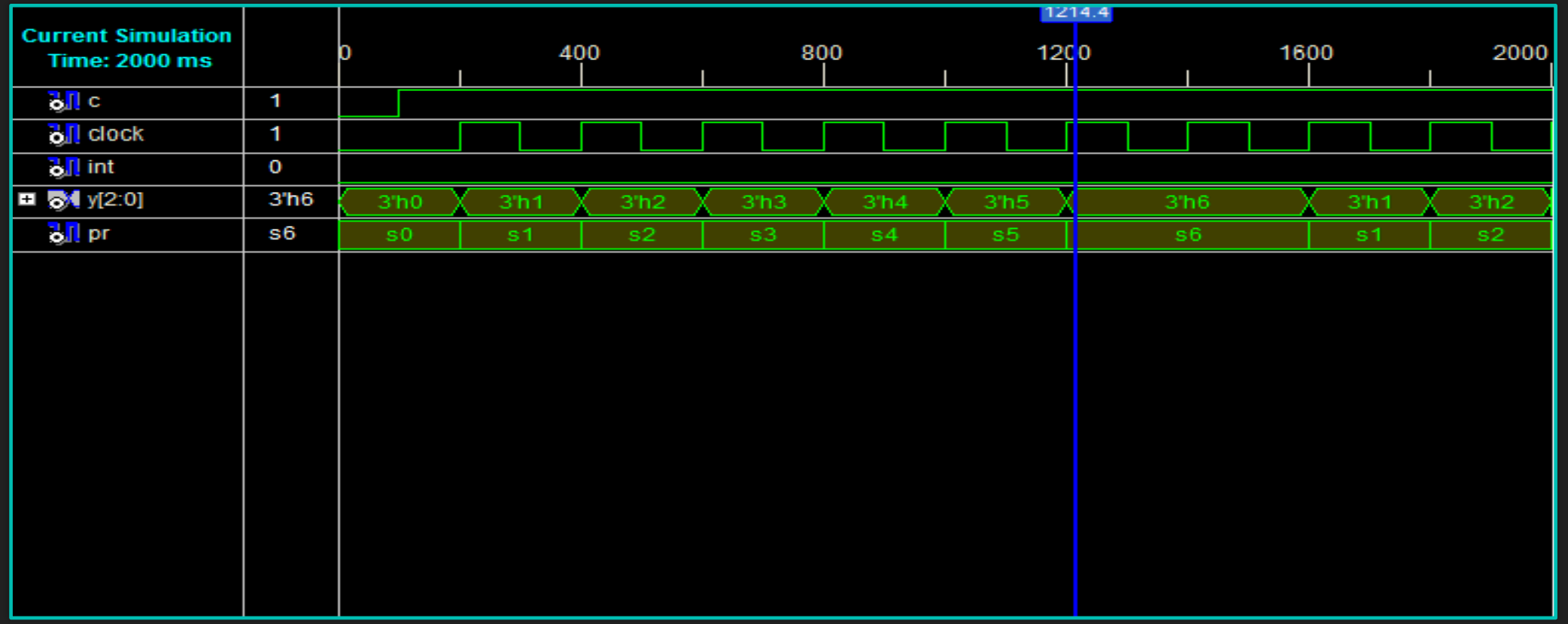
Block 2

- Block 2 is a counter that counts from 0 to 6.
- It counts number of times user enters his password.
- Its “int” is output from block 1.
- When int equals 1 , bock 2 returns to its initial state .
- It holds up for 300 ms after 6 trials.

State Diagram



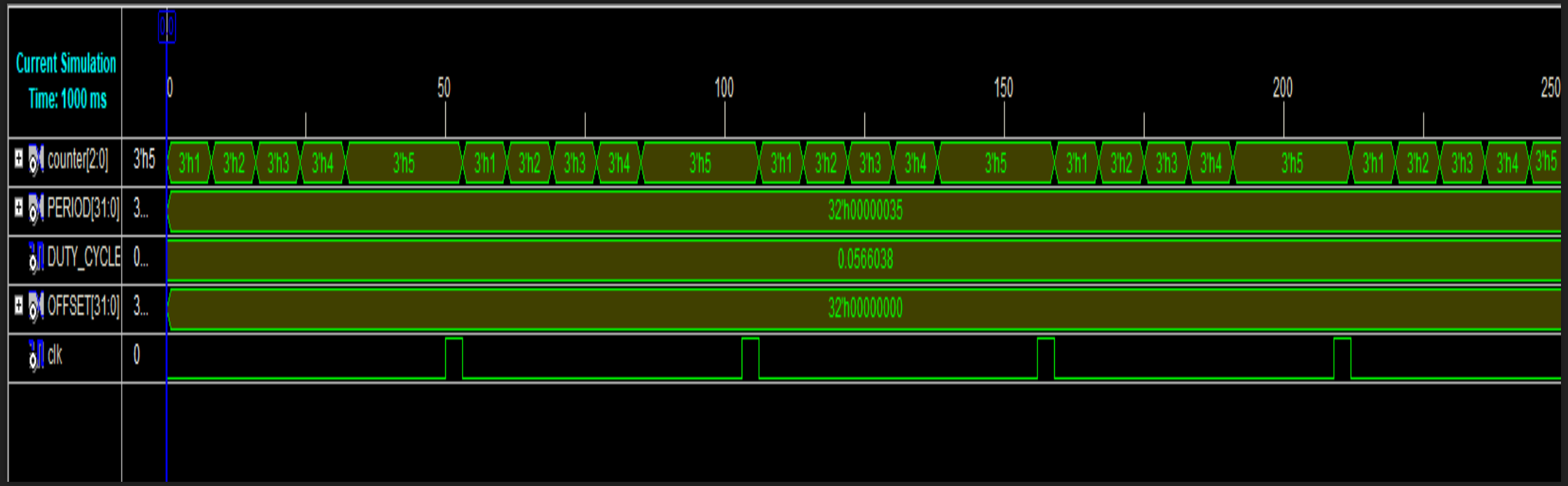
Simulation


Current Simulation Time: 2000 ms
1214.4
0
400
800
1200
1600
2000
c
1
clock
1
int
0
y[2:0]
3'h6
3'h0
3'h1
3'h2
3'h3
3'h4
3'h5
3'h6
3'h1
3'h2
pr
s6
s0
s1
s2
s3
s4
s5
s6
s1
s2

Timer

- Its function is to calculate the time of entering each password.
- The control is the input for the timer. Timer can't calculate the time according to the frequency of the control because the control has no specific frequency ,so we made a good idea for that.
- We make internal clock in the timer. This internal clock make cycle after 8 milliseconds. And we make a counter in it which counts the number of cycles the clock made.
- We suppose that the robot can guess each password in less than 40 milliseconds, so if the time of entering the password is greater than 40 milliseconds then he is a person else it's a robot.
- In the time 40 milliseconds the internal clock in the timer must make 5 cycles ,so we can compare using cycles.
- If the number of the cycles of the internal clock is less than 5 then it's robot. And if the number is equal to or greater than 5, it's human.
- So, the output from the timer is the number of cycles that the internal clock made in the period of entering the password which is the period of low time of the control.

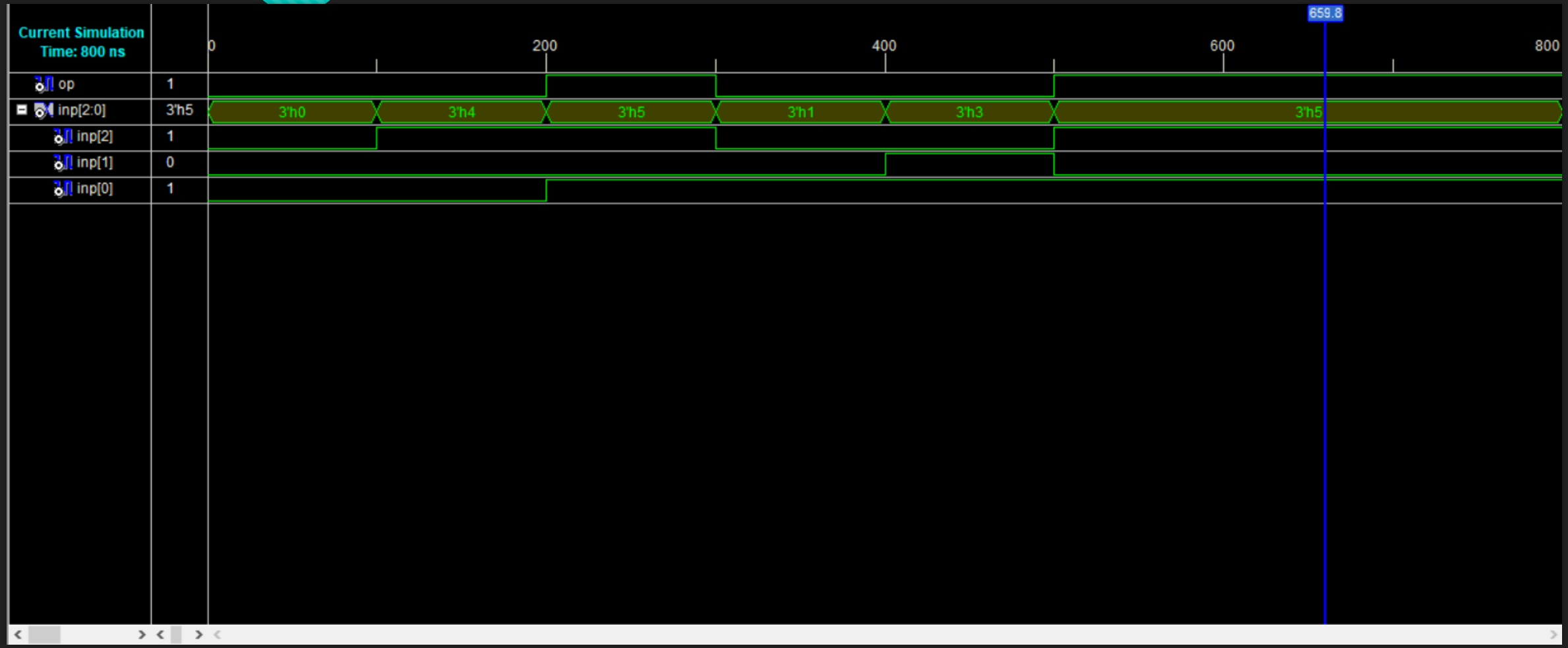
Simulation for the Timer



Block 3

- This block receives the output of the pulse generator (timer block) and compares it to the number five.
- If it is equal to five then the output will equal to one, which means it's a human.
- else the output will equal to zero, which means it's a robot.

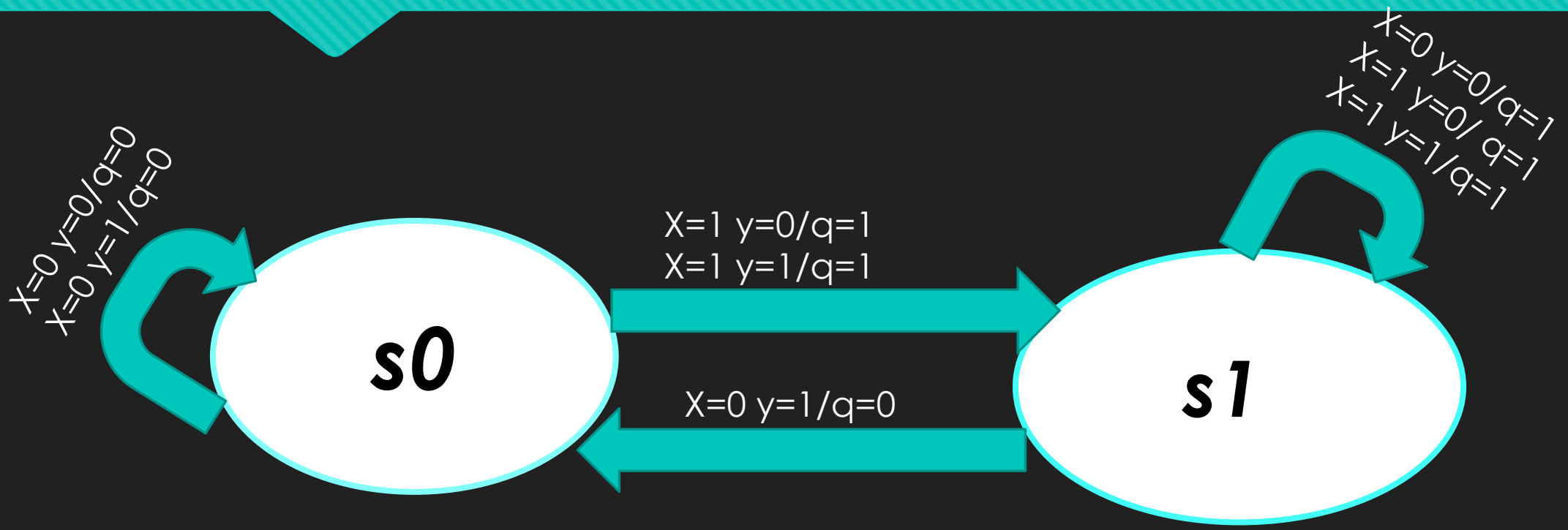
Simulation


Current Simulation
Time: 800 ns
659.8
0
200
400
600
800
op
1
inp[2:0]
3'h5
3'h0
3'h4
3'h5
3'h1
3'h3
3'h5
inp[2]
1
inp[1]
0
inp[0]
1

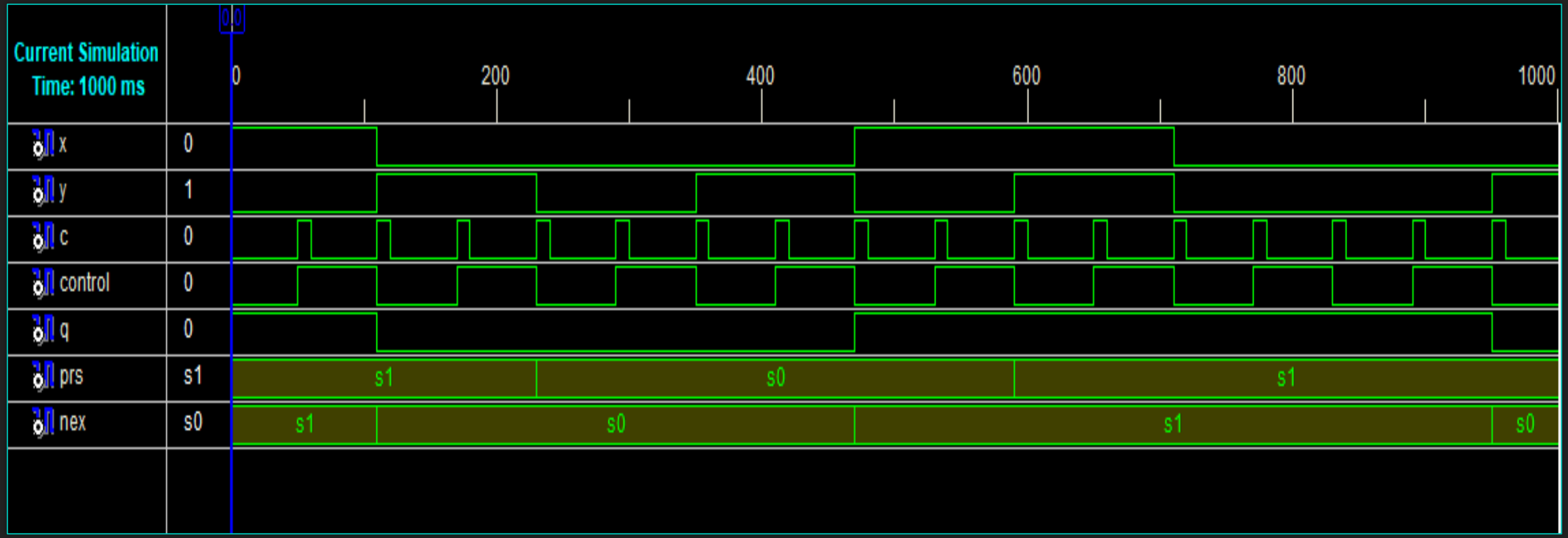
Block 4

- Block 4 determines if the user is human or robot . The inputs for block4 are the result from the time comparison with 5(x), the result from the counter comparison with 1(y), clock, and the control.
- If the result from the counter comparison with 1 equals 1, block4 at first see the result from the time comparison with 5. If it is equal 1, the result will be 1 indicating that it is human. And if it is equal 0, the block returns to its initial state to determine if it is human or robot after 6 trials.
- If the result from the time comparison with 5 equals 1, block 4 detects that the user in these 6 trials for entering the password is human as the result is 1. As if at least, there is one time the user takes time greater than 40 ms that means that it is not robot.
- Block 4 starts at the rising edge of clock and the control =1. Because each time that the control =1,that means that the user press enter to check if the password is correct or not.

State diagram



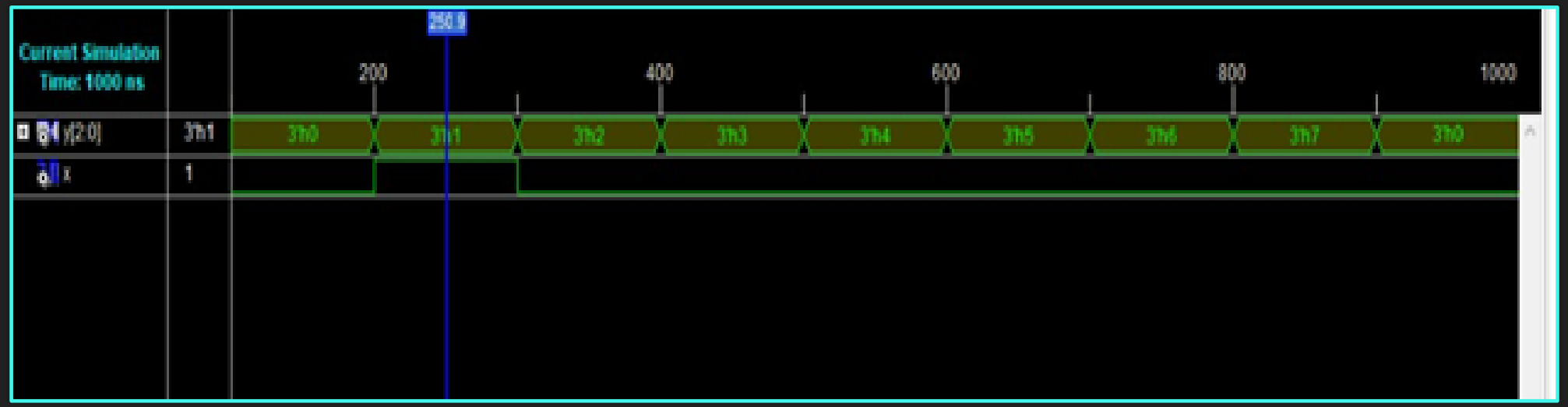
Simulation


Current Simulation Time: 1000 ms
0
200
400
600
800
1000
x
0
y
1
c
0
control
0
q
0
prs
s1
s1
s0
s1
nex
s0
s1
s0
s1
s0

Block 5

- Block 5 resets block 4 when its output equals 1 and the output from the time comparator with 5 equals 0.
- The inputs: 3-counter.
- Block 5 works as it checks the equality of 3-counter (the output of block 2) with 1.
- 3-counter equals to one at the first trial of registration.

Simulation


Current Simulation Time: 1000 ns
200
400
600
800
1000
3'h1
3'h0
3'h1
3'h2
3'h3
3'h4
3'h5
3'h6
3'h7
3'h0
1

Block 6

Block 6 has three inputs and one output

the inputs are :

- the first input is (X) which is out from block7 (one bit).
- the second input is output _c_w (Y) which is out from block1 ***(one bit).***
- the third input is output2 (Z) which is out from block4 ***(one bit).***

the outputs are :

- The output is result which is consists of two-bit which are result(0) and result (1).

Block6 analysis

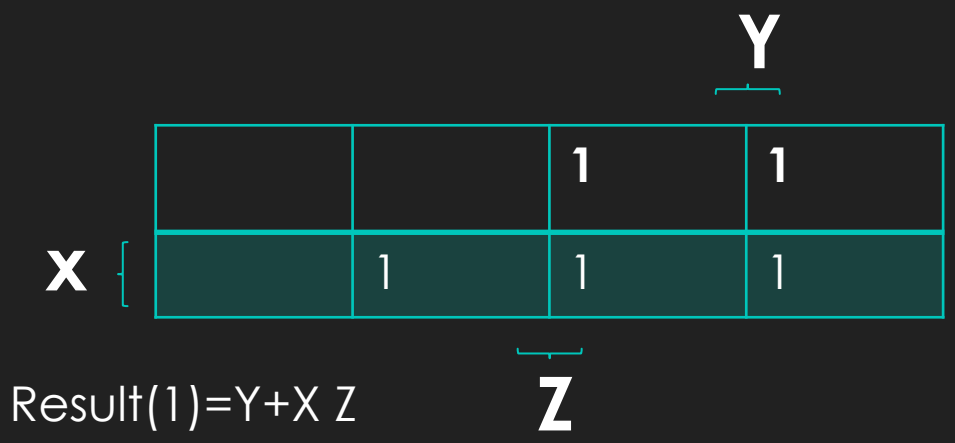
In Block 6 ,

- when output _c_w (Y) is equal 1 , result(0) and result (1) are 11 and this mean the password is correct in a one of times .
- When (X) which is out from block7 is equal 1 at the counter is (110) and output2 (Z) which is out from block4 is equal 1, result(0) and result (1) are 10 and this mean human enters it incorrect for 6 times .
- When (X) which is out from block7 is equal 1 and output2 (Z) which is out from block4 is equal 0 , result(0) and result (1) are 01 and this mean the robot enters

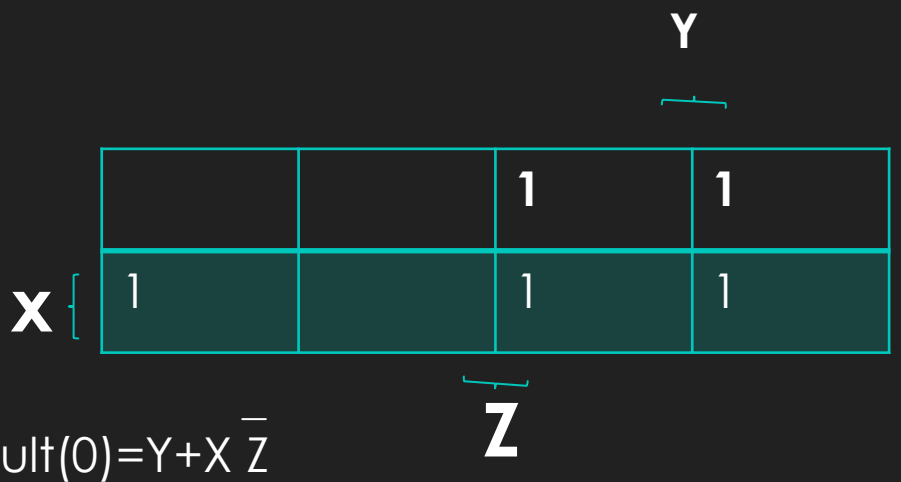
the password incorrect for 6 times .

Truth Table

x	y	z	Result(1)	Result(0)
0	0	0	0	0
0	0	1	0	0
0	1	0	1	1
0	1	1	1	1
1	0	0	0	1
1	0	1	1	0
1	1	0	1	1
1	1	1	1	1

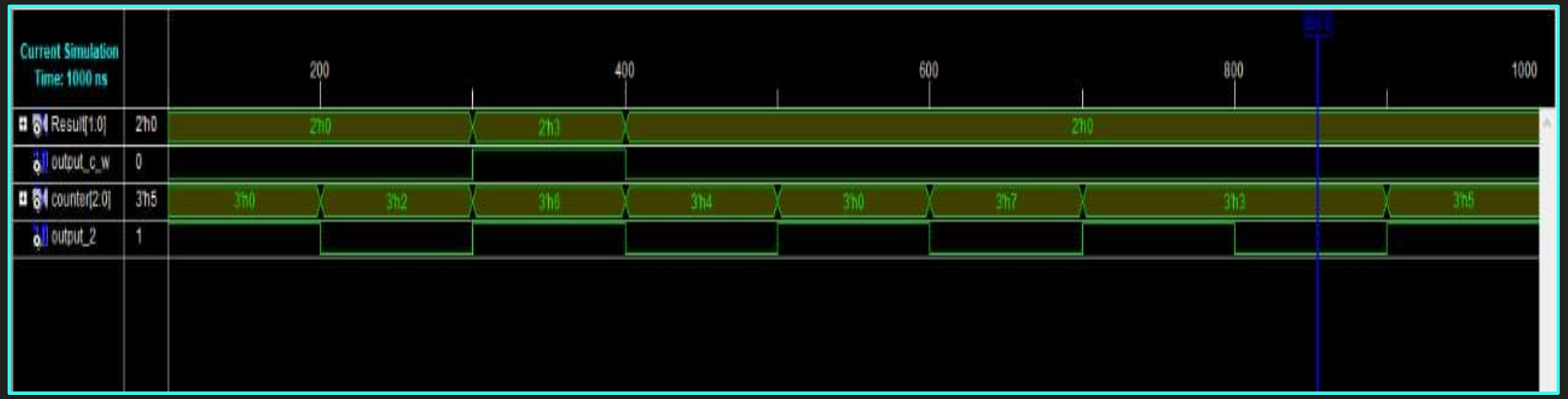


Result(1)=Y+X Z



Result(0)=Y+X $\overline{Z}$

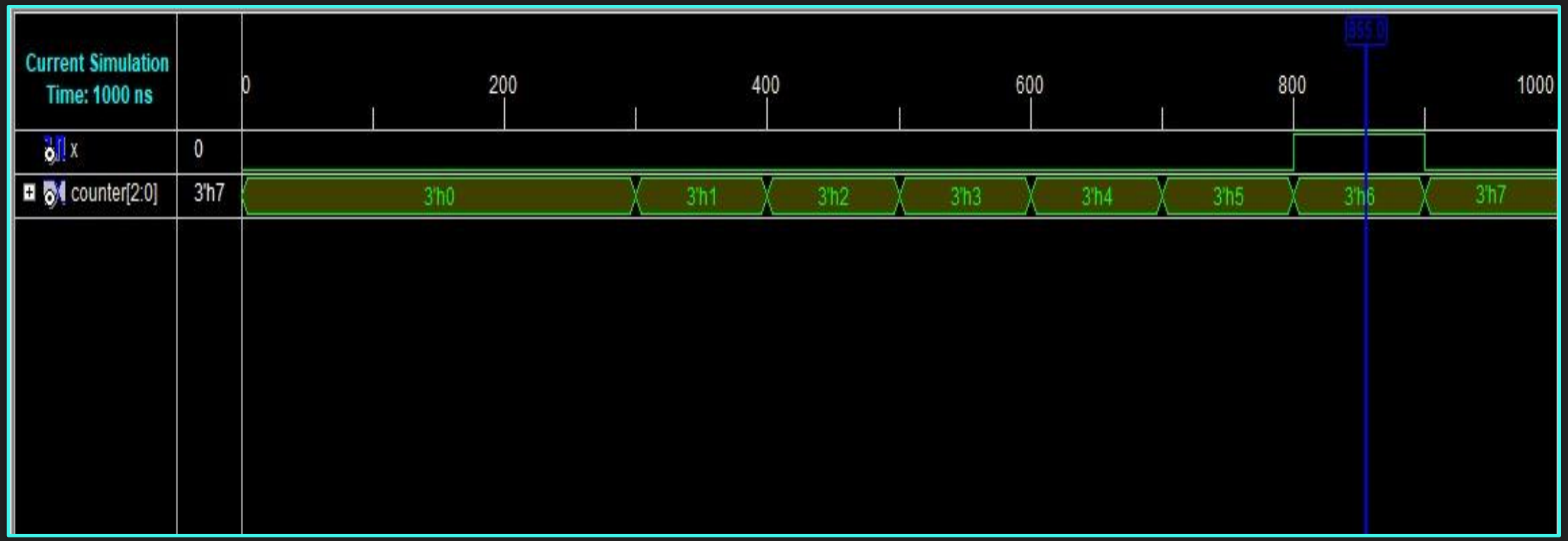
Simulation


Current Simulation Time: 1000 ns
200
400
600
800
1000
Result[1:0]
2'h0
2'h0
2'h3
2'h0
output_c_w
0
counter[2:0]
3'h5
3'h0
3'h2
3'h6
3'h4
3'h0
3'h7
3'h3
3'h5
output_2
1

Block 7

- It compares if the counter in block 6 equals “110”.
- It has an input which is the counter from block 2.
- It has one output which is the final result of the project.

Simulation


Current Simulation Time: 1000 ns
0
200
400
600
800
1000
x
0
counter[2:0]
3'h7
3'h0
3'h1
3'h2
3'h3
3'h4
3'h5
3'h6
3'h7