DENSITY BSED TRAFFIC CONTROL SYSTEM

Verilog code:-

```
1. module tlc(s,rst,t1,t2,t3,t4);
2. input [1:4]s;
3.     output reg [1:3] t1,t2,t3,t4;
4.     always @(*)
5.        begin
6.            if(rst==0)
7.               begin
8.                   t1=3'b000;
9.                    t2=3'b000;
10.                        t3=3'b000;
11.                         t4=3'b000;
12.                    end
13.                    else
14.                    begin
15.                    if(s==4'b0000|s==4'b1111) // when all
   roads having heavy traffic
16.                    begin                    // FIXED TIME
   CONCEPT (30 sec) for each junction
17.                        t1=3'b001;
18.                        t2=3'b100;
19.                        t3=3'b100;
20.                        t4=3'b100;
21.                        #20 t2=3'b010;
22.                        #10 t1=3'b100;
23.                        t2=3'b001;
```

```
                #20 t3=3'b010;
                #10 t2=3'b100;
                t3=3'b001;
                #20 t4=3'b010;
                #10 t3=3'b100;
                t4=3'b001;
            end
            else if(s==4'b0001) // when sensor 1 detects high traffic on road 1
                begin          // then more delay to green light on road 1
                    t1=3'b001;
                    t2=3'b100;
                    t3=4'b100;
                    t4=4'b100;
                    #40 $moniter("traffic cleared");
                end
                else if(s==4'b0010) // when sensor 2 detects high traffic on road 2
                                    // then more delay to green light on road 2

                begin
                    t1=3'b100;
                    t2=3'b001;
                    t3=4'b100;
                    t4=4'b100;
                    #40 $moniter("traffic cleared");
                end
                else if(s==4'b0100) // when sensor 3 detects high traffic on road 3
```

```
                                    // then more delay to
   green light on road 3

                begin
                   t1=3'b100;
                   t2=3'b100;
                   t3=4'b001;
                   t4=4'b100;
                   #40 $moniter("traffic cleared");
                end
                else if(s==4'b1000)  // when sensor 4
   detects high traffic on road 4
                                    // then more delay to
   green light on road 4

                begin
                   t1=3'b100;
                   t2=3'b100;
                   t3=4'b100;
                   t4=4'b001;
                   #40 $moniter("traffic cleared");
                end
                else if(s==4'b0011)  // when sensor 1
   and sensor 2 detects high traffic on road 1 and 2
                                    // then more delay to
   green light on road 1 followed by green light on road 2

                  begin
                   t1=3'b001;
                   t2=3'b100;
                   t3=4'b100;
```

```
                t4=4'b100;
                #30 t2=3'b010;
                #10 t1=3'b100;
                t2=3'b001;
                #40   $moniter("traffic cleared");
            end
            else if(s==4'b0101)  // when sensor 1 and sensor 3 detects high traffic on road 1 and 3
                                 // then more delay to green light on road 1 followed by green light on road 3

              begin
                t1=3'b001;
                t2=3'b100;
                t3=4'b100;
                t4=4'b100;
                #30 t3=3'b010;
                #10 t1=3'b100;
                t3=3'b001;
                #40  $moniter("traffic cleared");
            end
            else if(s==4'b0110)  // when sensor 2 and sensor 3 detects high traffic on road 2 and 3
                                 // then more delay to green light on road 2 followed by green light on road 3

              begin
                t1=3'b100;
                t2=3'b001;
                t3=4'b100;
                t4=4'b100;
```

```
                    #30 t3=3'b010;
                    #10 t2=3'b100;
                    t3=3'b001;
                    #40  $moniter("traffic cleared");
                end
                else if(s==4'b1001)  // when sensor 1 and sensor 4 detects high traffic on road 1 and 4
                                     // then more delay to green light on road 1 followed by green light on road 4

                  begin
                    t1=3'b001;
                    t2=3'b100;
                    t3=4'b100;
                    t4=4'b100;
                    #30 t4=3'b010;
                    #10 t1=3'b100;
                    t4=3'b001;
                    #40  $moniter("traffic cleared");
                end
                else if(s==4'b1010)  // when sensor 2 and sensor 4 detects high traffic on road 2 and 4 respectively
                                     // then more delay to green light on road 2 followed by green light on road 4

                  begin
                    t1=3'b100;
                    t2=3'b001;
                    t3=4'b100;
                    t4=4'b100;
```

```
                #30 t4=3'b010;
                #10 t2=3'b100;
                t4=3'b001;
                #40  $moniter("traffic cleared");
            end
            else if(s==4'b1100)  // when sensor 3 and sensor 4 detects high traffic on road 3 and 4 respectively
                                 // then more delay to green light on road 3 followed by green light on road 4

              begin
                t1=3'b100;
                t2=3'b100;
                t3=4'b001;
                t4=4'b100;
                #30 t4=3'b010;
                #10 t3=3'b100;
                t4=3'b001;
                #40  $moniter("traffic cleared");
            end
            else if(s==4'b0111)  // when sensor 2,3,4 detects high traffic on road 2,3,4 respectively
                                 // then more delay to green light on road 2 followed by green light on road 3,4

              begin
                t1=3'b001;
                t2=3'b100;
                t3=4'b100;
```

```
                t4=4'b100;
                #30 t2=3'b010;
                #10 t1=3'b100;
                t2=3'b001;
                #30 t3=3'b010;
                #10 t2=3'b100;
                t3=3'b001;
                #40 $moniter("traffic cleared");
            end
            else if(s==4'b1011)  // when sensor 1,2,4 detects high traffic on road 1,2,4 respectively
                                 // then more delay to green light on road 1 followed by green light on road 2,4

            begin
                t1=3'b001;
                t2=3'b100;
                t3=4'b100;
                t4=4'b100;
                #30 t2=3'b010;
                #10 t1=3'b100;
                t2=3'b001;
                #30 t4=3'b010;
                #10 t2=3'b100;
                t4=3'b001;
                #40 $moniter("traffic cleared");
            end
            else if(s==4'b1101)  // when sensor 1,3,4 detects high traffic on road 1,3,4 respectively
                                 // then more delay to
```

```
   green light on road 1 followed by green light on road
   3,4
181.
182.                    begin
183.                     t1=3'b001;
184.                     t2=3'b100;
185.                     t3=4'b100;
186.                     t4=4'b100;
187.                     #30 t3=3'b010;
188.                     #10 t1=3'b100;
189.                     t3=3'b001;
190.                     #30 t4=3'b010;
191.                     #10 t3=3'b100;
192.                     t4=3'b001;
193.                     #40 $moniter("traffic cleared");
194.                   end
195.                   else if(s==4'b1110)  // when sensor
   2,3,4 detects high traffic on road 2,3,4 respectively
196.                                        // then more delay to
   green light on road 2 followed by green light on road
   3,4
197.
198.                    begin
199.                     t1=3'b100;
200.                     t2=3'b001;
201.                     t3=4'b100;
202.                     t4=4'b100;
203.                     #30 t3=3'b010;
204.                     #10 t2=3'b100;
205.                     t3=3'b001;
206.                     #30 t4=3'b010;
```

```
                    #10 t3=3'b100;
                    t4=3'b001;
                    #40 $moniter("traffic cleared");
                end
            end
        end
    endmodule
```

Result:-

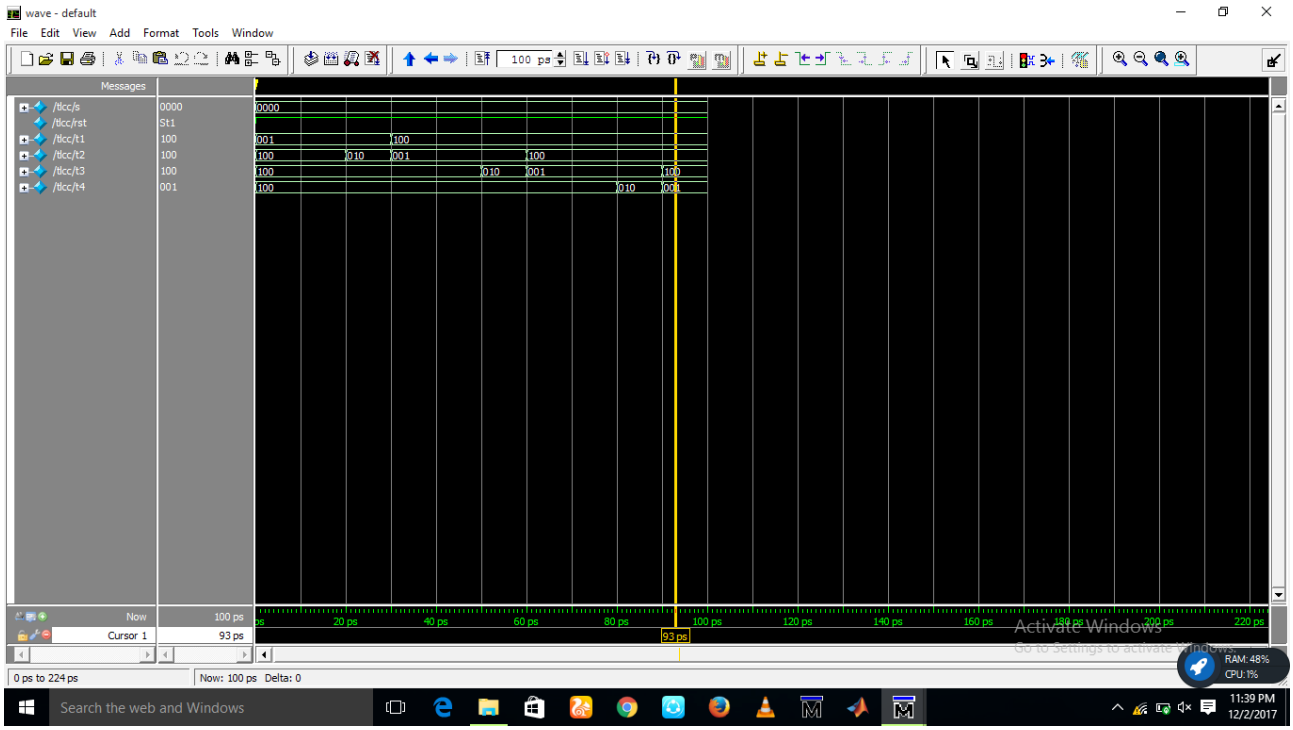

Fig.1 S=0000,rst=1

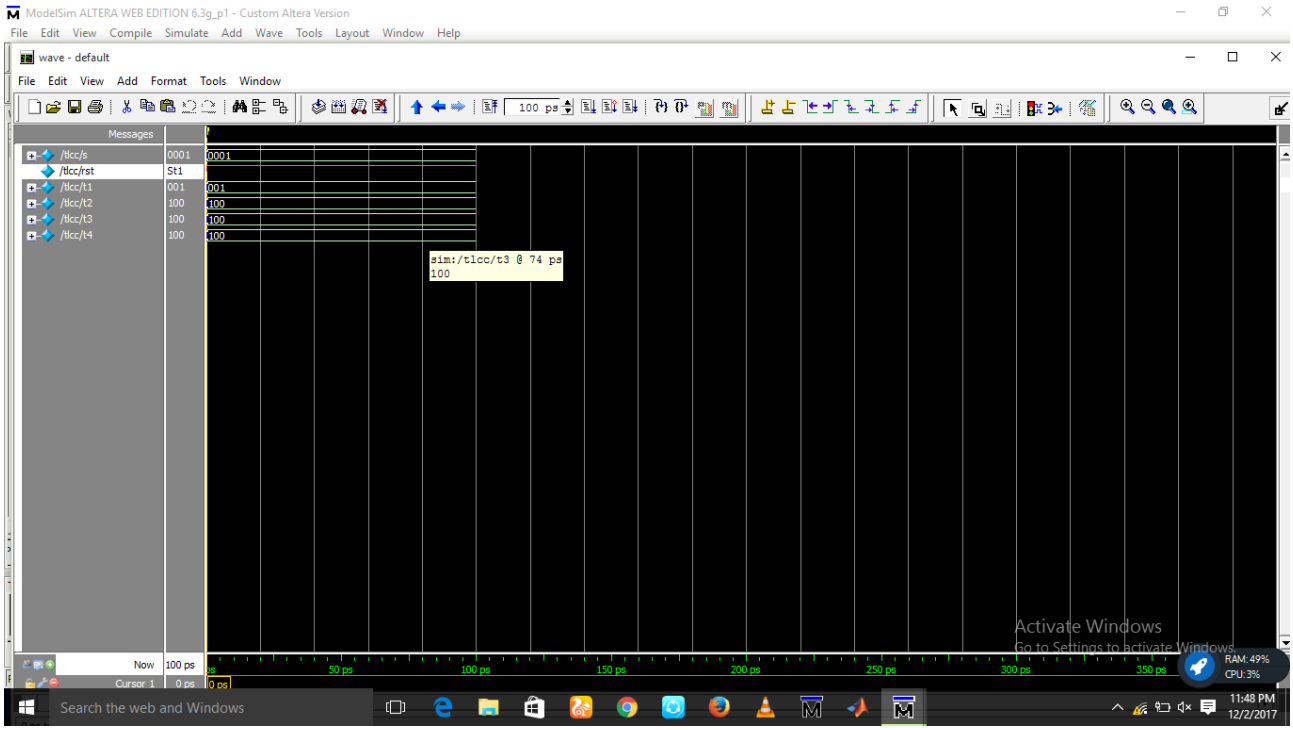

Fig 2.S=0001,rst=1

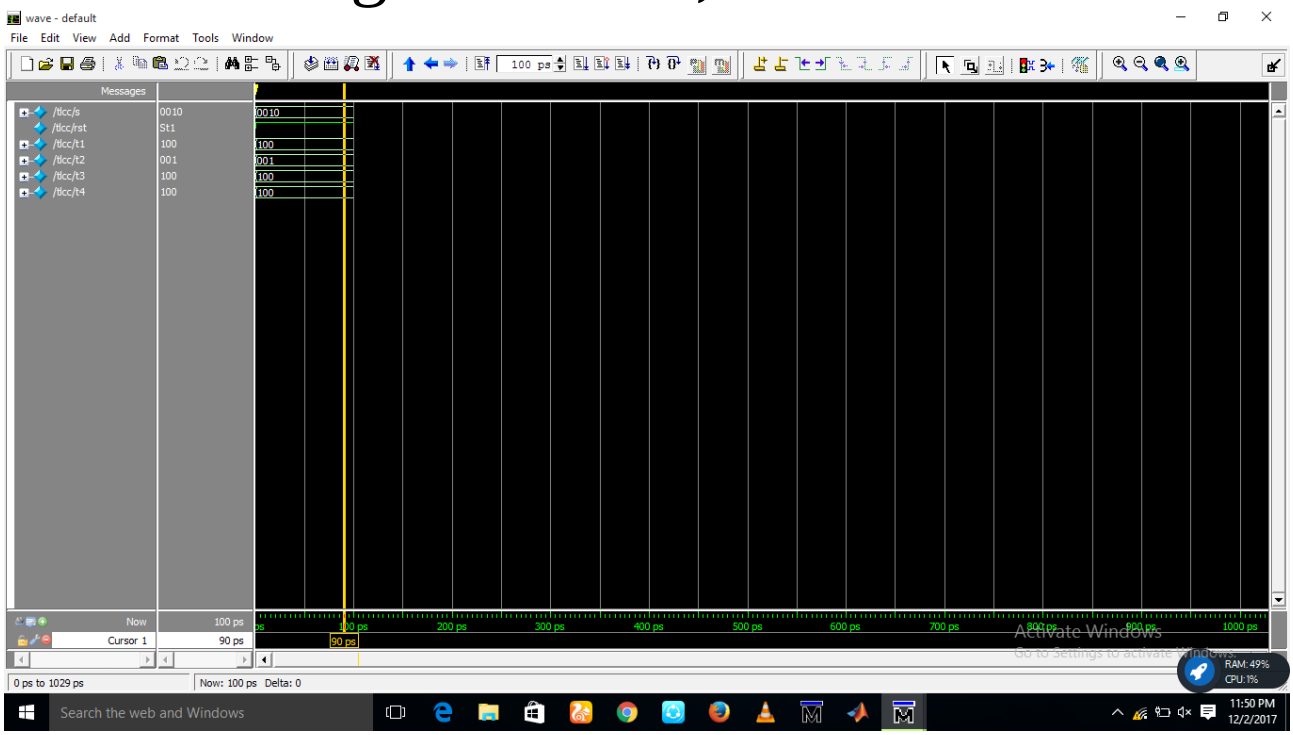

Fig 3.S=0010,rst=1

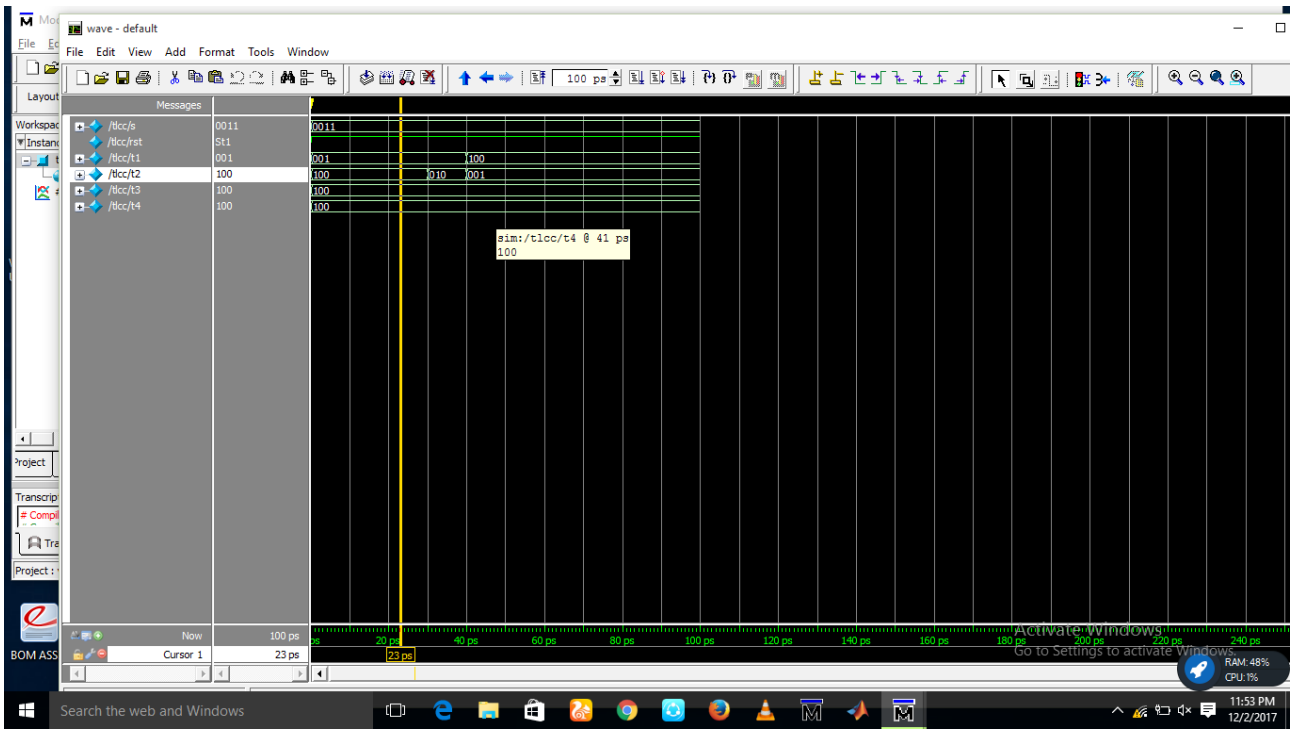

Fig 4.S=0011,rst=1

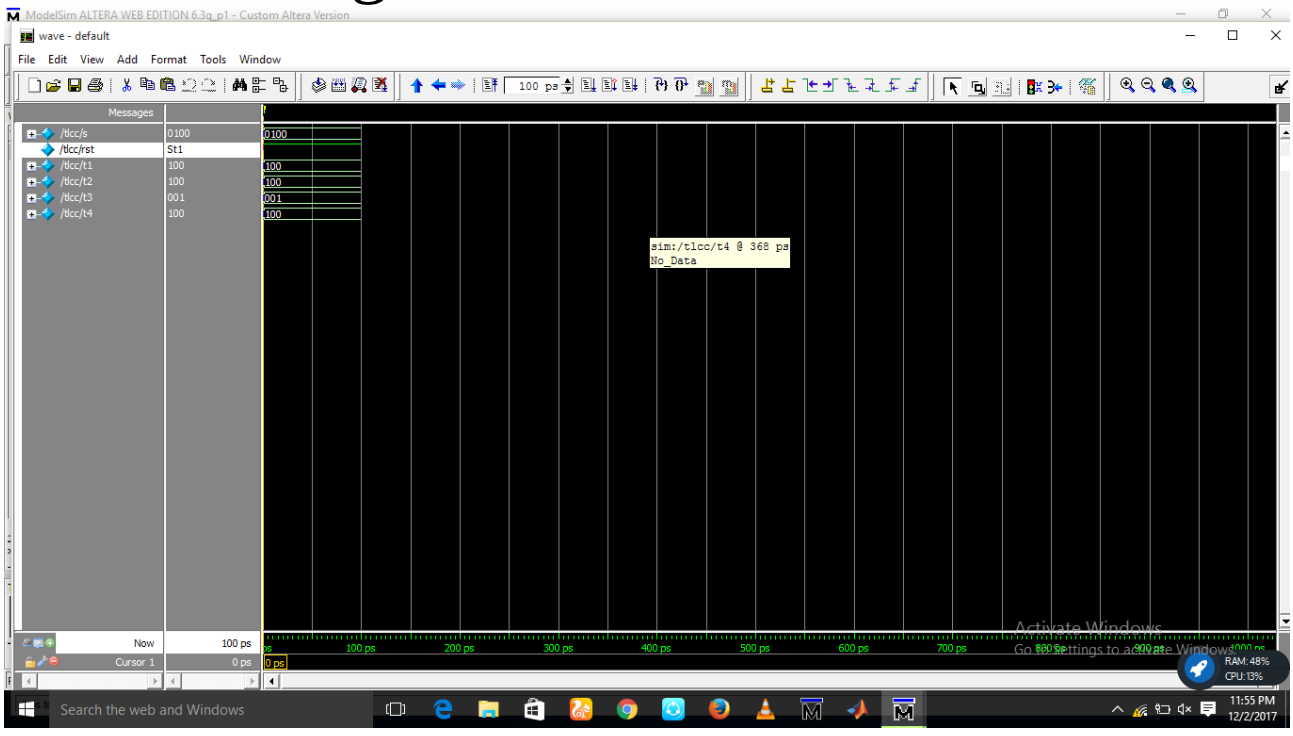

Fig 5.S=0100,rst=1

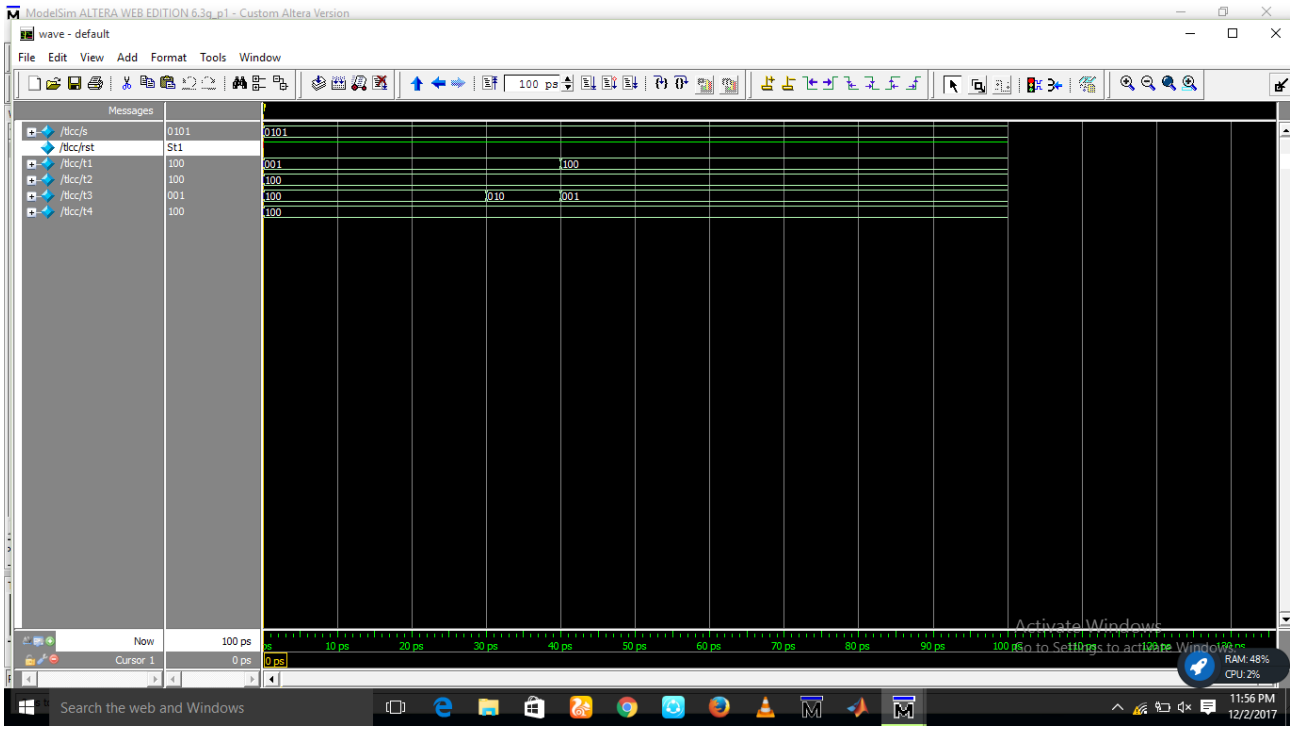

Fig 6.S=0101,rst=1

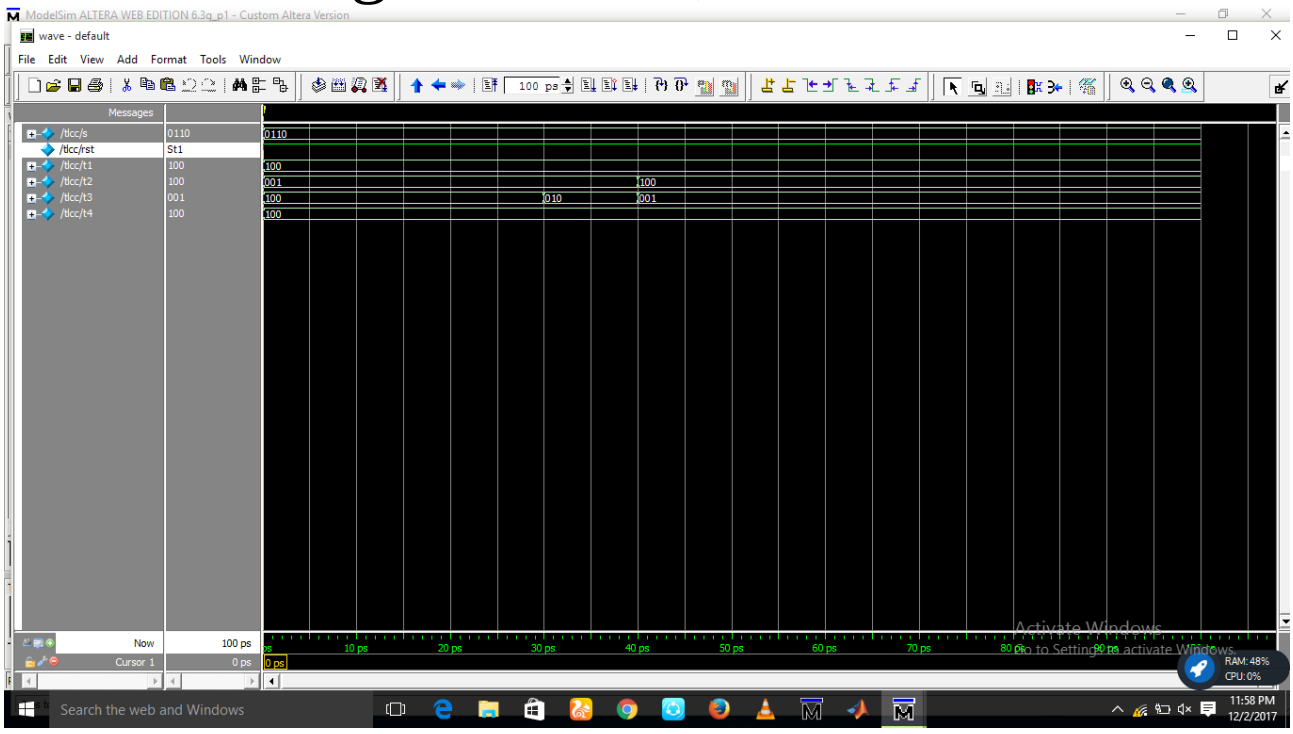

Fig 7.S=0110,rst=1

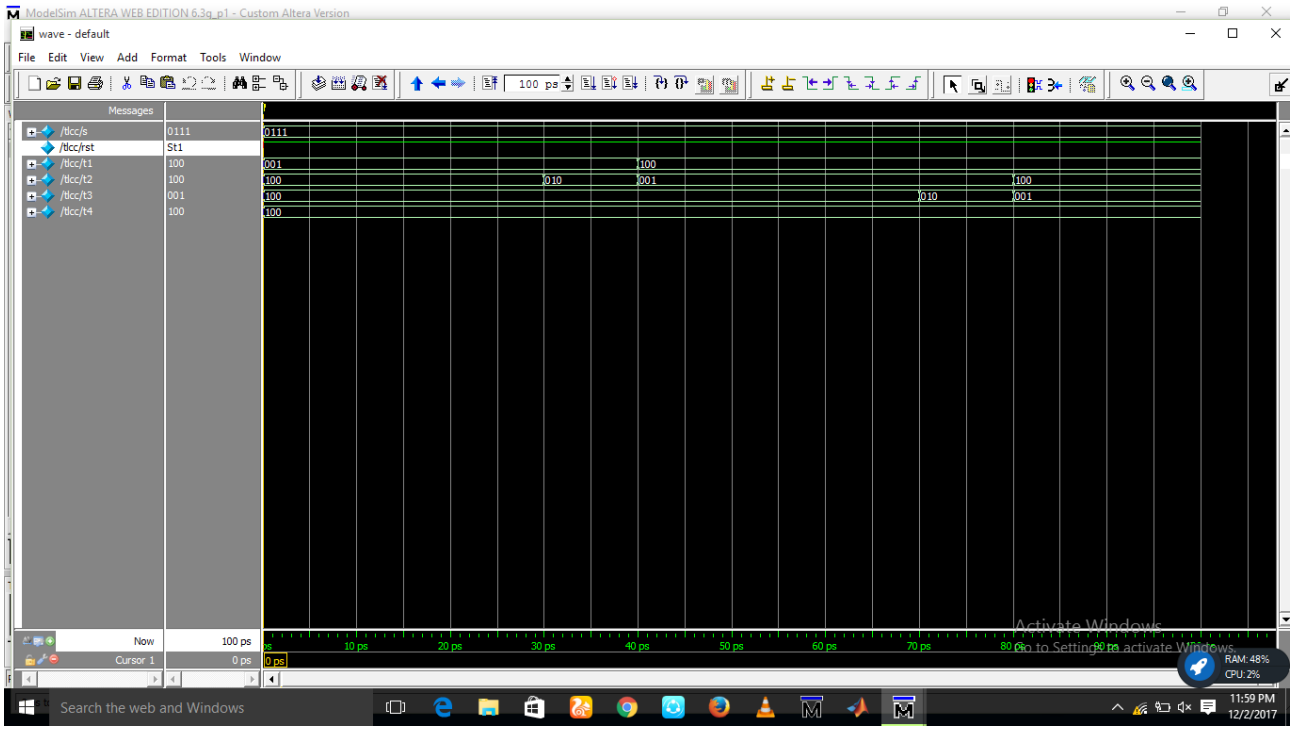

Fig 8.S=0111,rst=1

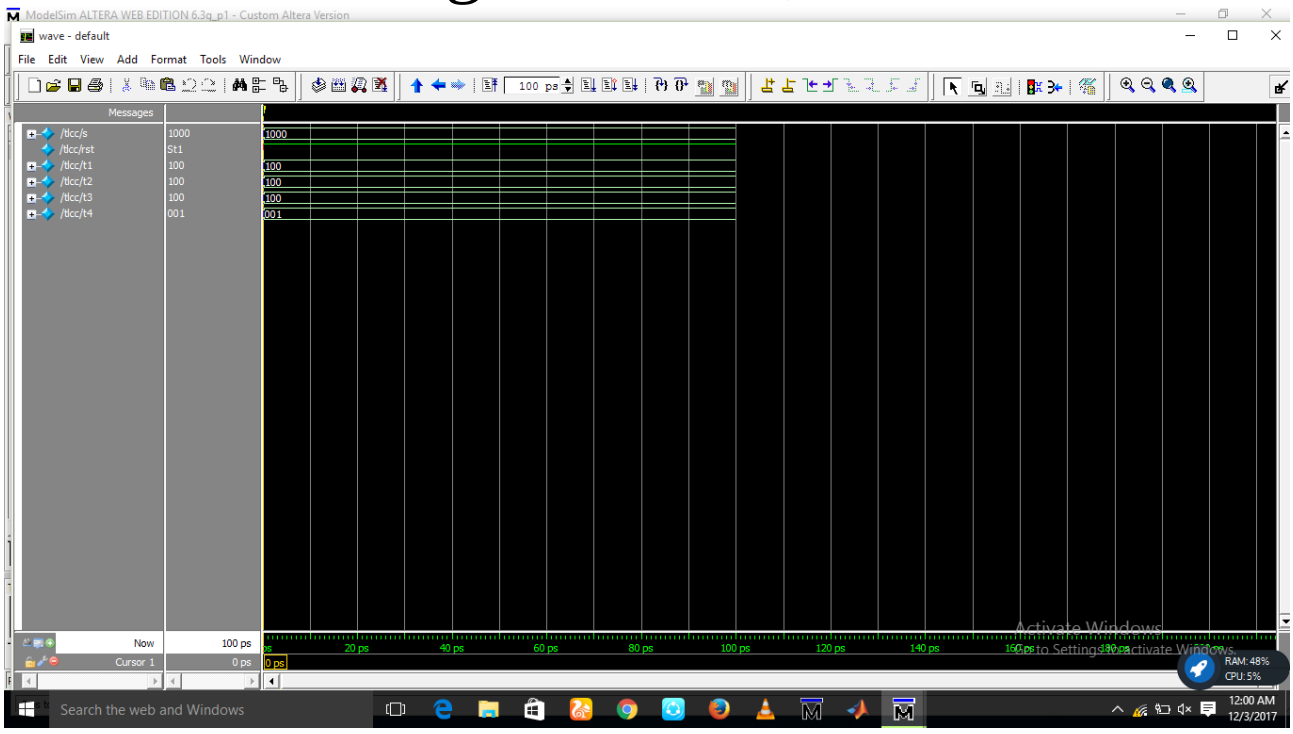

Fig 9.S=1000,rst=1

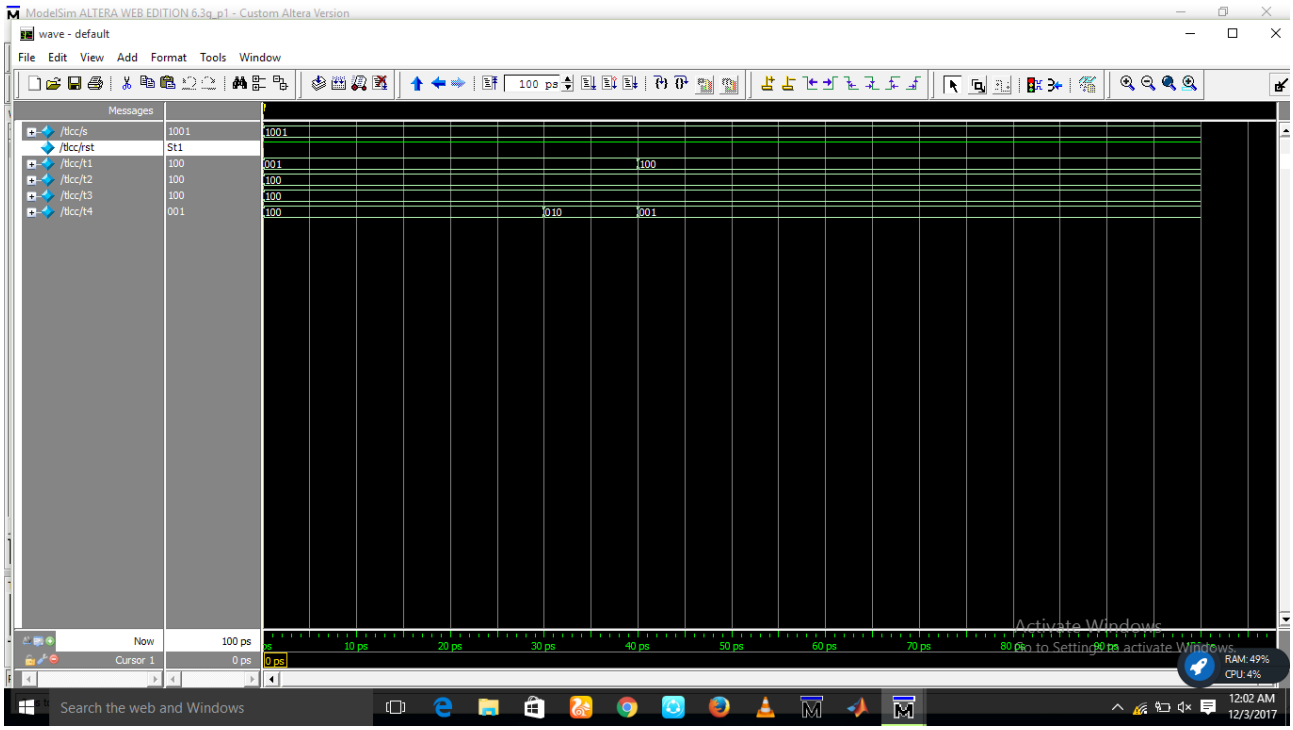

Fig 10.S=1001,rst=1

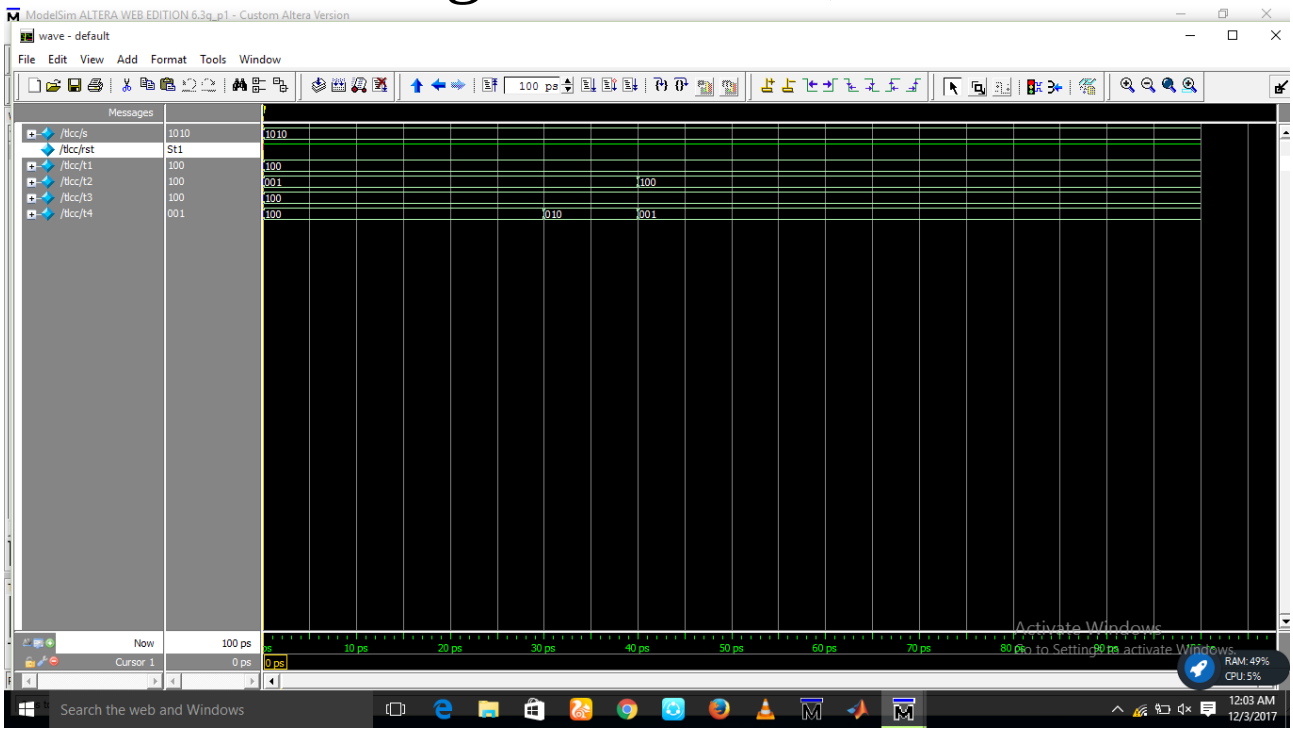

Fig 11.S=1010,rst=1

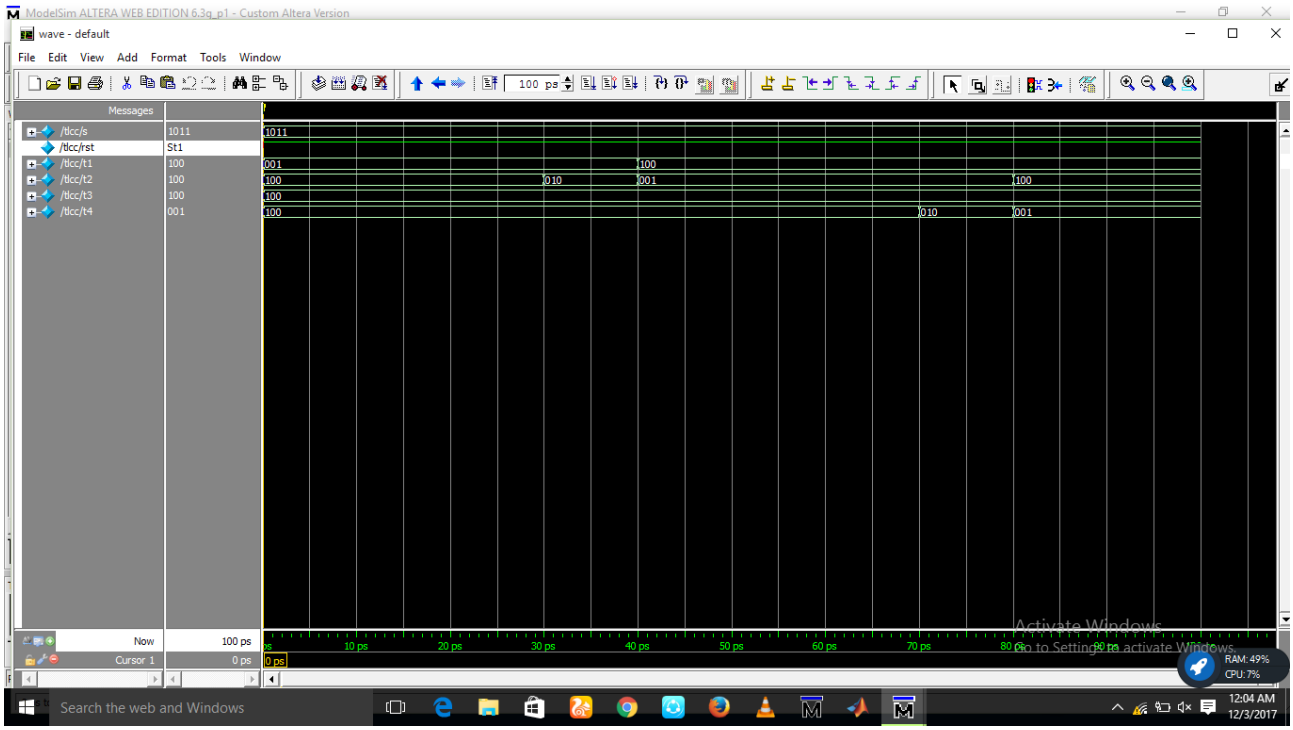

Fig 12.S=1011,rst=1

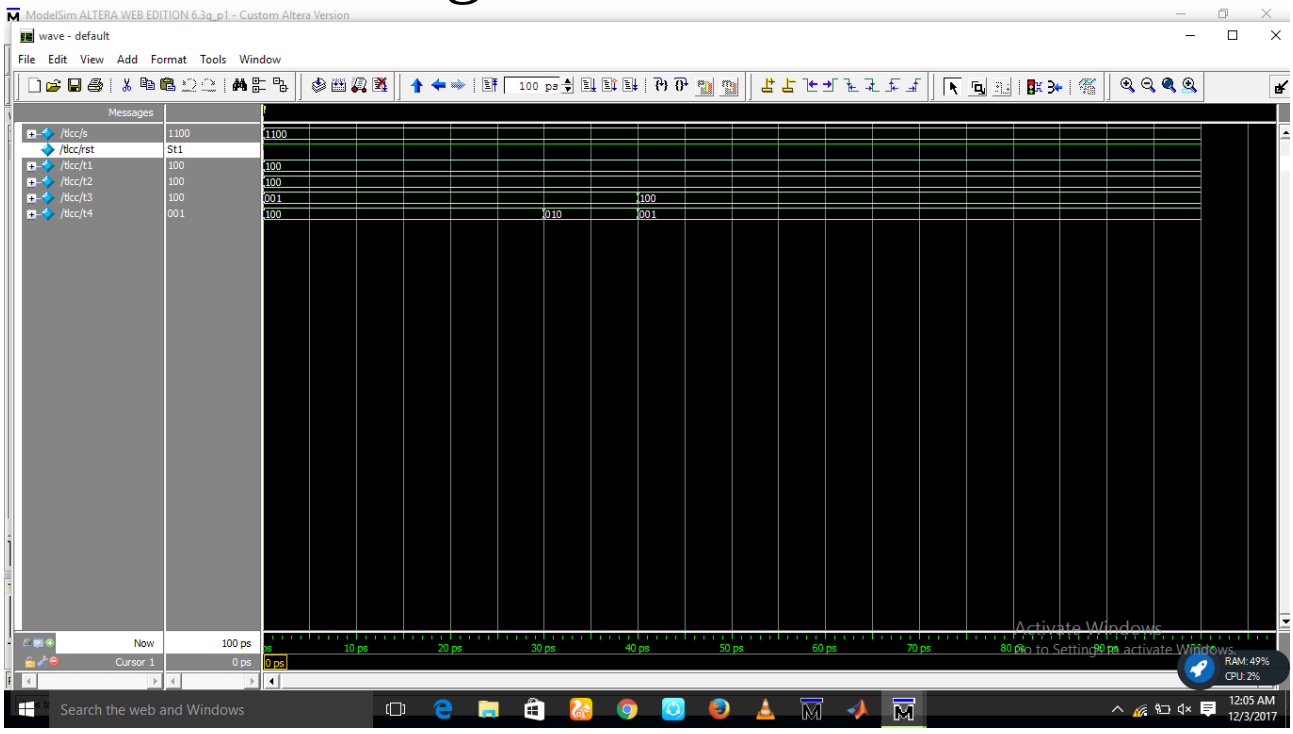

Fig 13.S=1100,rst=1

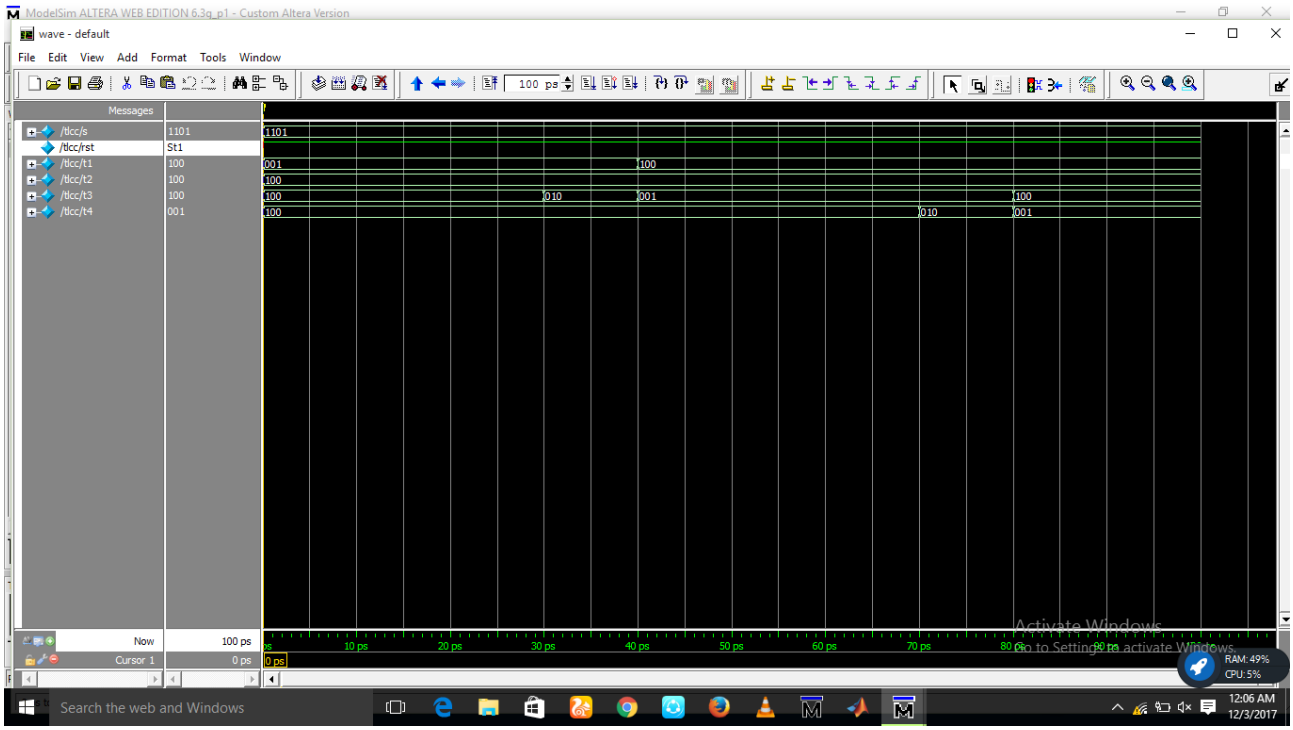

Fig 14.S=1101,rst=1

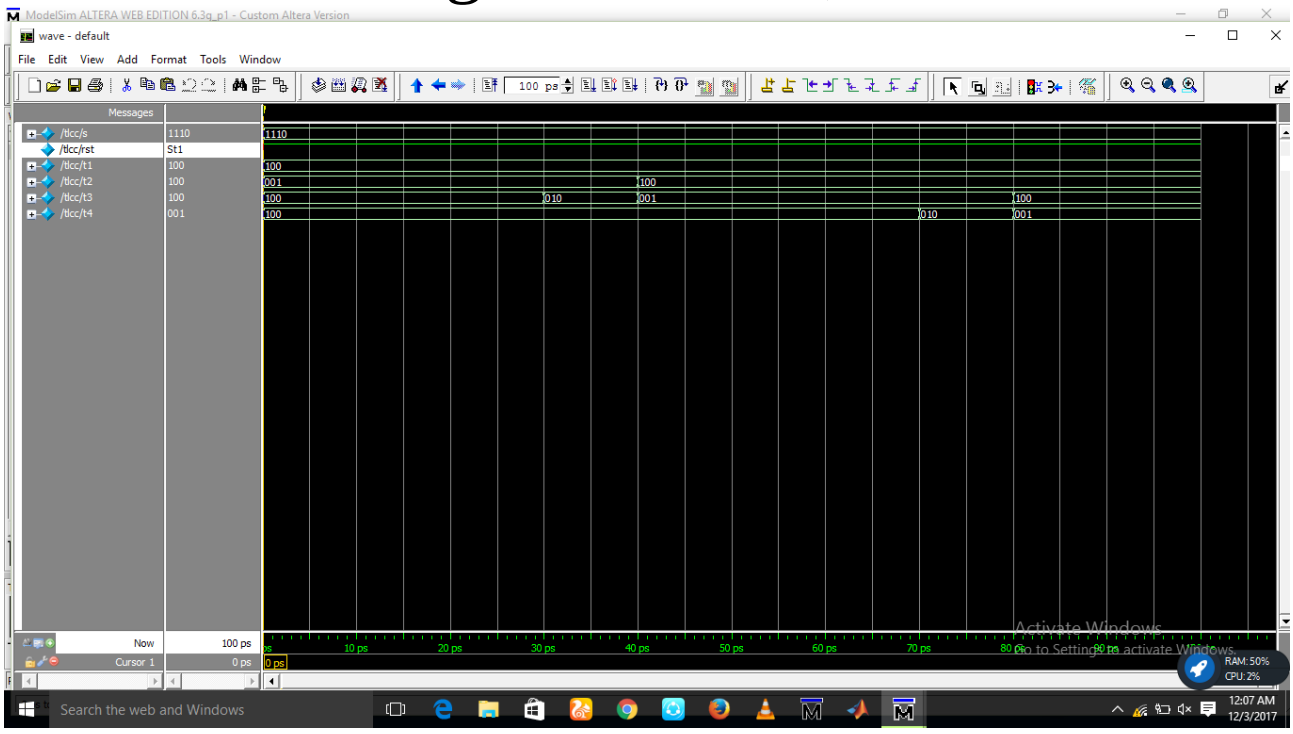

Fig 15.S=1110,rst=1

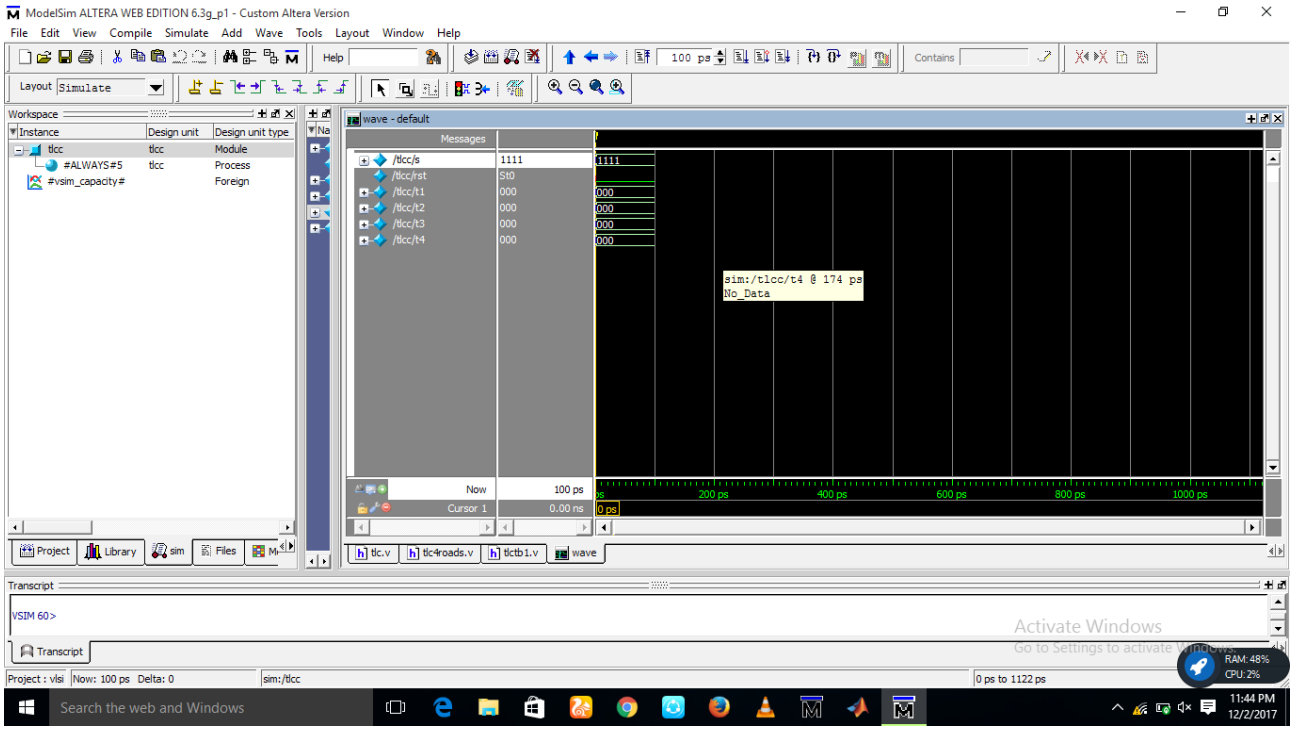

Fig 15.S=1111,rst=0

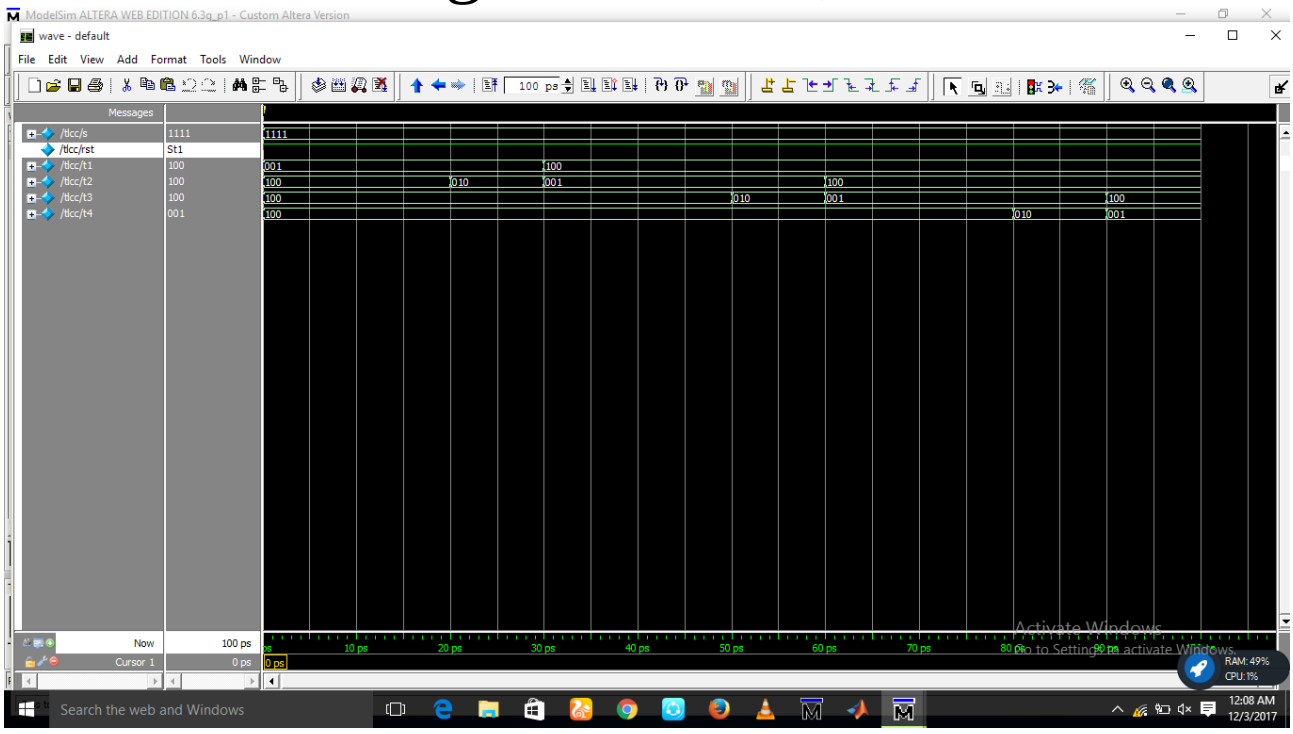

Fig 16.S=1111,rst=1