module main\_code(

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Inputs and Output \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

input wire Start,/\*This is our input Start that starts our FSM Module For Pattern Detection\*/

input wire Clock, /\*This is our main module Clock\*/

input wire Reset, /\*This is our main module Reset\*/

input wire [1:0]Memory\_Selector,/\*2 Bit Memory selector basically works as a switch that tells

which memory data should be transfers to pattern detection module\*/

output [10:0] Pattern\_Result /\*Pattern\_Result tells us about the number of time virus pattern\*/

/\*detected in the Given IP Memory selected using Memory\_Selector\*/

);

wire Enable = 0, Input\_in=0; /\*Assigning IP Memorys Enable and Inputs to Zero\*/

wire wire\_mem1; /\*Wire\_mem1 Connects IP Memory 1 "faseehu" output to Memory\_Selector 1st Pin\*/

wire wire\_mem2; /\*Wire\_mem2 Connects IP Memory 2 "danyala" output to Memory\_Selector 2nd Pin\*/

wire wire\_mem3; /\*Wire\_mem3 Connects IP Memory 3 "muzamils" output to Memory\_Selector 3rd Pin\*/

reg Selecting\_wire; /\*Selecting\_wire bascially connects output wires\*/

/\*of IP Blocks to Pattern Detection Module\*/

reg [12:0]Counter; /\*13 bit Counter that counts upto 8000 addresses

of an IP Memory Location and transfer Data\*/

initial begin

Counter = 1'b0; /\*\*\*\*\*\*\*\*\*\*\* Initializing Counter to zero \*\*\*\*\*\*\*\*\*\*\*/

end

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\*\*\* Always Block For Reset and Counter \*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

always@(posedge Clock,posedge Reset)

begin

if(Reset)

Counter=1'b0;

else if(Counter==13'b1111101000000) /\*Every Time Counter Reaches "8000" addresse it remains at that position\*/

Counter=13'b1111101000000; /\*8000 binary is equal to "1111101000000"\*/

else

Counter=Counter+1'b1; /\*Kept counting addresses and feeding data to Virus Detection module

until it reaches 8000 addresses\*/

end

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\*\*\* Memory Module Instantiation \*\*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

faseehu mem1 (

.clka(Clock), .wea(wea), .addra(Counter), .dina(Input\_in), .douta(wire\_mem1));

danyala mem2 (

.clka(Clock), .wea(wea), .addra(Counter), .dina(Input\_in), .douta(wire\_mem2));

muzamils mem3 (

.clka(Clock), .wea(wea), .addra(Counter), .dina(Input\_in), .douta(wire\_mem3) );

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\*\*\* FSM Module Instantiation \*\*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

cep first(.virus\_counter(Pattern\_Result),.Input(Selecting\_wire), .Clock(Clock), .Reset(Reset), .Start(Start));

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Memory Module Selection\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

always @\*

begin

case(Memory\_Selector)

/\*When we feed Memory\_Selector 2'b00 it connects "faseehu" IP Memory Block To Pattern Detection Code\*/

2'b00:

Selecting\_wire = wire\_mem1;

/\*When we feed Memory\_Selector 2'b01 it connects "danyala" IP Memory Block To Pattern Detection Code\*/

2'b01:

Selecting\_wire = wire\_mem2;

/\*When we feed Memory\_Selector 2'b10 it connects "muzamils" IP Memory Block To Pattern Detection Code\*/

2'b10:

Selecting\_wire = wire\_mem3;

/\*When we feed Memory\_Selector 2'b11 it connects "muzamils" IP Memory Block To Pattern Detection Code\*/

2'b11:

Selecting\_wire = wire\_mem3;

endcase

end

endmodule