**Testbench for Encryption:**

module tb\_aes();

reg [127:0] data\_in;

reg [127:0] key;

wire [127:0] data\_out;

AES\_encryption g1(.data\_out(data\_out),.data\_in(data\_in),.key(key));

initial begin

data\_in=128'h\_33333333\_bbbbbbbb\_aaaaaaaa\_99999999;

key = 128'h\_2b7e1516\_28aed2a6\_abf71588\_09cf4f3c;

#100;

$display("----------------------------------------");

$display("data sent (data\_in) is %h", data\_in);

$display("key: %h", key);

$display("encrypted Output: %h", data\_out);

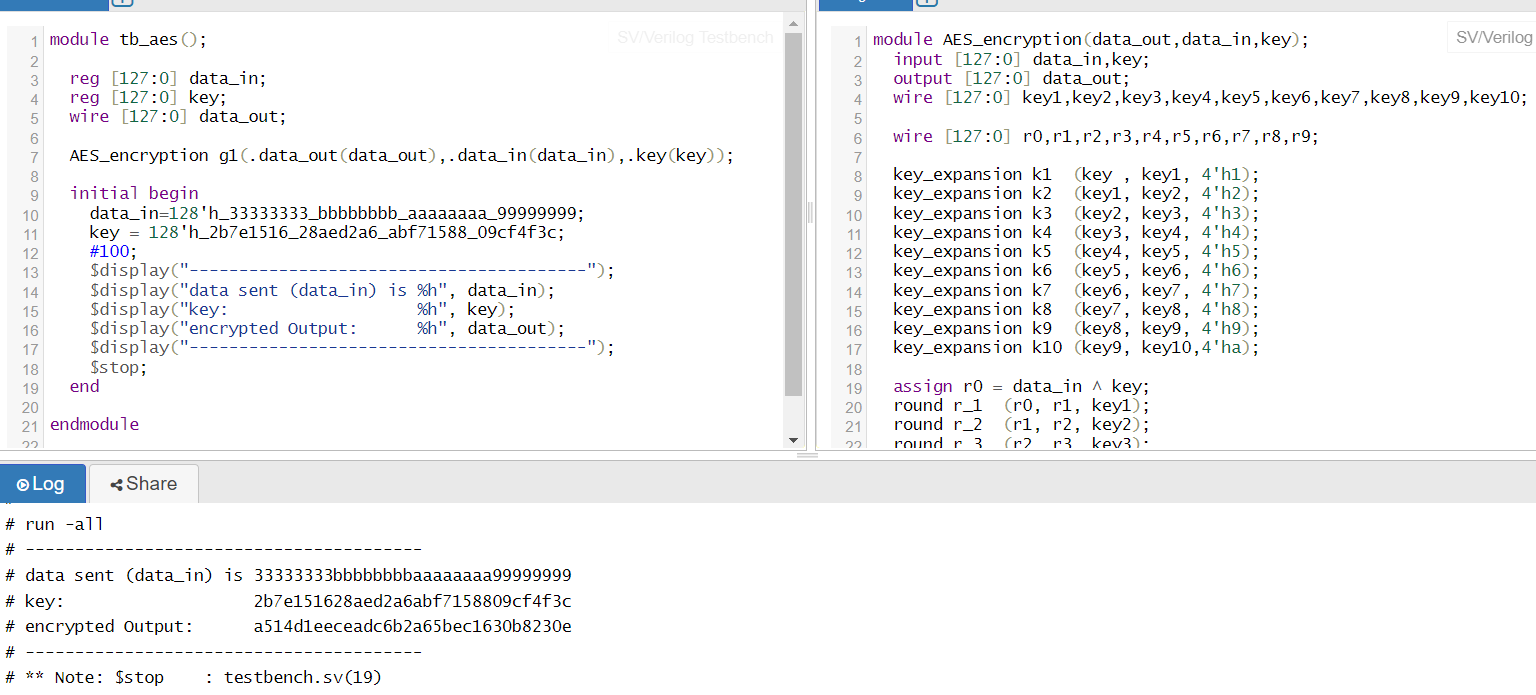
$display("----------------------------------------");

$stop;

end

endmodule

RESULTS:



**Testbench code for decryption:**

module tb\_aes();

reg [127:0] data\_in;

reg [127:0] key;

wire [127:0] data\_out;

AES\_decryption g3(.data\_out(data\_out),.data\_in(data\_in),.key(key));

initial begin

data\_in=128'ha514d1eeceadc6b2a65bec1630b8230e;//output at encryption stage

key = 128'h2b7e151628aed2a6abf7158809cf4f3c;

#100;

$display("------------------------------------------------------");

$display("encrypted data (data\_in) is %h", data\_in);

$display("key: %h", key);

$display("decrypted Output: %h", data\_out);

$display("------------------------------------------------------");

$stop;

end

Endmodule

RESULTS:

