30 DAYS OF VERILOG

AIM – TO IMPLEMENT BINARY TO GRAY CODE CONVERTER

Gray code is a binary code where each successive value differs from the previous value by only one bit.

STEPS FOR CONVERSION

Let's convert 1101 to Gray code

1. Take the first bit 1 and write it to the output: 1
2. XOR the second bit 1 with the previous bit 1 : 1 xor 1 =1. Write 0 to the output.
3. XOR the third bit 0 with the previous bit 1 : 0 xor 1 =1. Write 1 to the output.
4. XOR the fourth bit 1 with the previous bit 0 : 1 xor 0 =1. Write 1 to the output.

The Gray code representation of `1101` is `1101` in this case.

SCHEMATIC –
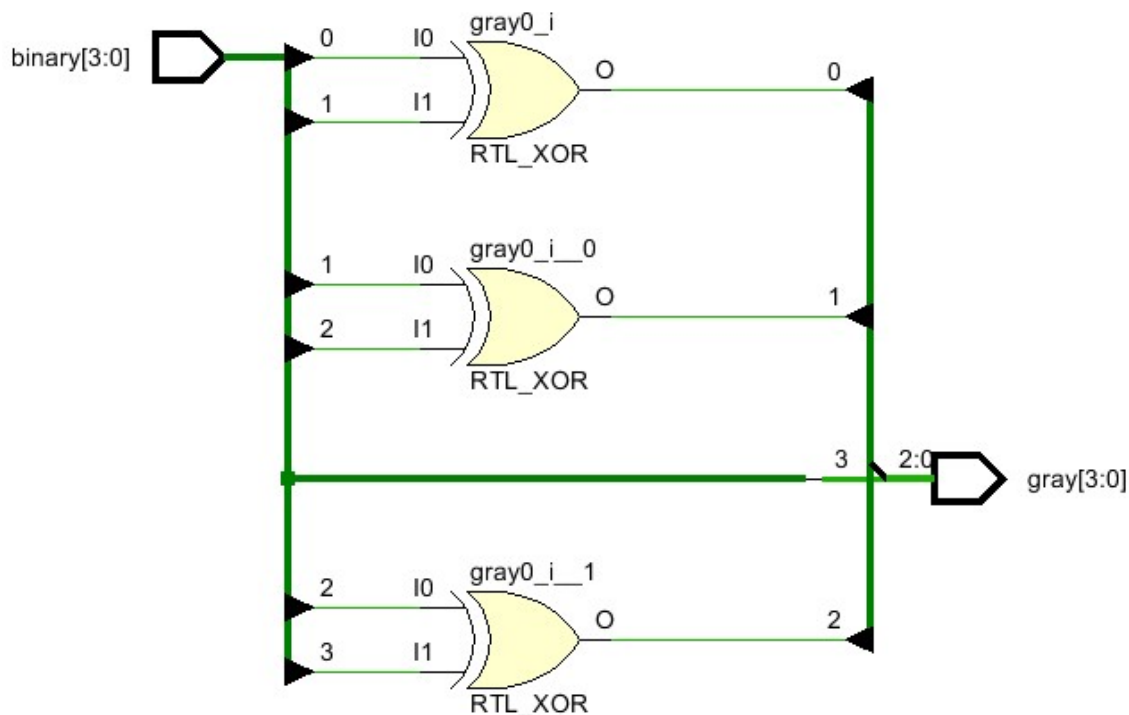
CODE –

```verilog
4   // Engineer:
5   //
6   // Create Date:     17:21:38 12/02/2017
7   // Design Name:
8   // Module Name:    bg6
9   // Project Name:
10  // Target Devices:
11  // Tool versions:
12  // Description:
13  //
14  // Dependencies:
15  //
16  // Revision:
17  // Revision 0.01 - File Created
18  // Additional Comments:
19  //
20  //////////////////////////////////////////////////////////////////////////////////
21  module bg6(
22      input [3:0] b,
23      output reg [3:0] g
24      );
25  always@(b)
26  begin
27  g[3]=b[3];
28  g[2]=b[3]^b[2];
29  g[1]=b[2]^b[1];
30  g[0]=b[1]^b[0];
31  end
```

WAVEFORM –