**RTL CHALLENGE**

**DAY – 25** :- Verilog Code for Implementation of Binary to Gray Converter.

**Software used**:- Xilinx Vivado(2023.1)

**Theory:-**

**1. Inputs: The input to the converter is a binary number.**

**2. Conversion Algorithm: To convert a binary number to Gray code, you typically perform XOR operations between successive bits of the binary number.**

**3. Process: Starting from the most significant bit (MSB) to the least significant bit (LSB), perform XOR operations between each bit and its immediate neighbor on the left.**

**For example:**

**• The MSB of the Gray code is the same as the MSB of the binary number.**

**• The next bit of the Gray code is the result of XORing the MSB and the second bit of the binary number.**

**• The subsequent bits of the Gray code are obtained by XORing the corresponding bits of the binary number and the Gray code.**

**4. Outputs: The output of the converter is the corresponding Gray code representation of the input binary number.**

**5. Example: Let's convert the binary number 1010 to Gray code:**

**• Binary: 1 0 1 0 • Gray: 1 (1 XOR 0) (0 XOR 1) (1 XOR 0) = 1101**

**6. Implementation: You can implement this conversion algorithm using XOR gates in hardware or by writing a program in software.**

**7. Expansion: The conversion process can be scaled up for larger binary numbers by applying XOR operations to each pair of corresponding bits.**



