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**Binary ,Gray Code Conversion**

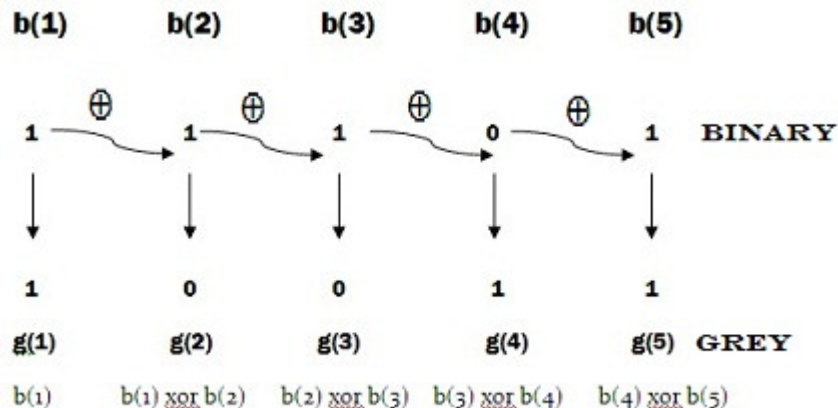
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**Binary and Gray Code Conversion**

This below worksheet help you to understand how to perform Binary to Grey code and Grey to Binary code conversion. The grey code is a type of distance code also known as cyclic codes. In unit distance code the bit patterns for two consecutive numbers will differ in one bit position.

Lets Consider The Binary number  $B_1 B_2 B_3 B_4 \dots B_n$  and the Gray code is  $G_1 G_2 G_3 G_4 \dots G_n$

1. Most significant bit ( $B_1$ ) is same as the most significant bit in Gray Code ( $B_1 = G_1$ )
2. To find next bit perform Ex-OR (Exclusive OR) between the Current binary bit and previous bit.  
 $G_n = B_n \text{ (Ex-OR) } B_{n-1}$
3. Look the below Image for Binary to Gray code Conversion

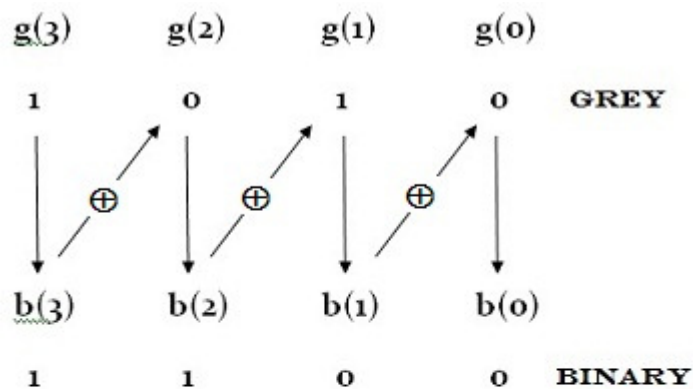


### Gray Code to Binary Conversion

Follow the below steps to convert Gray Code to Binary

1. Most significant bit ( $G_1$ ) is same as the most significant bit in Binary Code ( $G_1 = B_1$ )
  2. The next number can be obtain by taking Exclusive OR operation between the previous binary bit, and the current gray code bit and write down the value.
- Repeat the Above Step until you find  $B_n$

Look at the below example for Converting Binary to Gray Code.



i.e

$$b(3) = g(3)$$

$$b(2) = b(3) \oplus g(2)$$

$$b(1) = b(2) \oplus g(1)$$

$$b(0) = b(1) \oplus g(0)$$

When you try this calculation on your own, use this *binary - grey code converter* (<http://ncalculators.com/digital-computation/binary-gray-code-converter.htm>) to verify your answers.

### Similar Worksheets

Worksheet for Binary to Decimal, Hexa and Octal number conversion ([../math-worksheets/binary-to-decimal-hexa-octal-number-conversion.htm](http://math-worksheets.com/binary-to-decimal-hexa-octal-number-conversion.htm))

Worksheet for Decimal to Binary Conversion ([../math-worksheets/how-to-perform-decimal-to-binary-conversion.htm](http://math-worksheets.com/how-to-perform-decimal-to-binary-conversion.htm))

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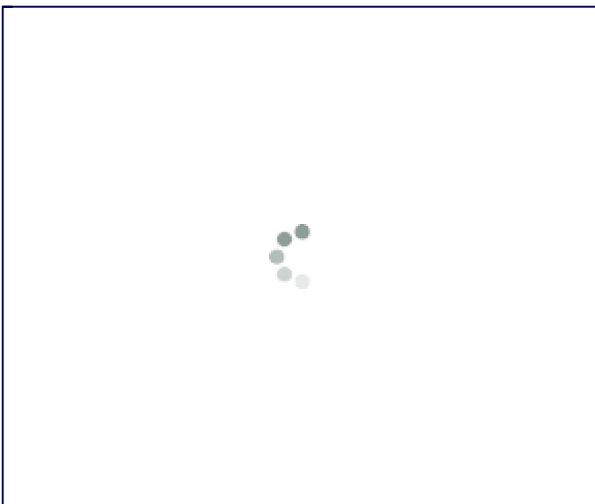
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