

Episode 7.05 - Flipping Bits using the Bitwise Inverse and Bitwise-XOR

(Transcript URL:

<https://intertainment.com/episode-7-05-flipping-bits-using-the-bitwise-inverse-and-bitwise-xor/>)

Show Description: Inverting or flipping the bits of an integer is the third and last method of "bit bashing" we will discuss. There are two ways to invert bits: either flip all of them at once or use a mask to identify which bits to flip and which to leave alone.

Try it Yourself

All of the code presented in this worksheet can be executed in a JavaScript-enabled browser. No compiler or other software development tool is needed. There are two ways to do this:

- Copy the code into a text editor such as Notepad (Windows) or TextEdit (Mac), and save the file with the extension `.html`. Locate the file on your computer and open it in a browser. Some tablets and smartphones allow you to store a text file to the file system and open it in a browser, but the process is more complicated.
- Alternatively, you can use a web-based tutorial service such as https://www.w3schools.com/js/tryit.asp?filename=tryjs_myfirst. Replace the code in their editor window with the code shown below, and then run it.

Podcast Timestamp	Supporting Details
1:42	<p>Using a Bitwise-OR to Determine Number of Bits in an Integer</p> <p>The code below shows how we can determine how many bits JavaScript uses for an integer, minus the single leading zero.</p> <pre><!DOCTYPE html> <html> <head> <title>Determining Integer Size using JavaScript - intermation.com</title> </head> <body> <p>The most positive integer is <script> document.write(((~0)>>>1).toString(2)); </script> </p> </body> </html></pre> <p>Expected Output</p> <p>The most positive integer is 111111111111111111111111111111</p>

Podcast Timestamp	Supporting Details
3:10	<p style="text-align: center;"><i>Using toString() to Display Integers in Different Bases</i></p> <p>The code below shows how we can use the argument of the toString() function to change the base in which an integer value is displayed.</p> <pre> <!DOCTYPE html> <html> <head> <title>Displaying Integer Bases with toString() - intermation.com</title> </head> <body> <p> <script> var value = 27437; document.write("
Value in base 16: " + value.toString(16)); document.write("
Value in base 10: " + value.toString(10)); document.write("
Value in base 8: " + value.toString(8)); document.write("
Value in base 2: " + value.toString(2)); </script> </p> </body> </html> </pre> <p style="text-align: center;"><i>Expected Output</i></p> <p style="text-align: center;">Value in base 16: 6b2d Value in base 10: 27437 Value in base 8: 65455 Value in base 2: 110101100101101</p>
5:45	<p style="text-align: center;"><i>Inverting the Transparency of an ARGB-Formatted Value</i></p> <pre> var OpaqueLavenderARGB = 0xFFE6E6FA; var TransparentLavenderARGB = 0xFF000000 ^ OpaqueLavenderARGB; </pre>
7:49	<p style="text-align: center;"><i>Inverting Bits 2 and 3 of the Integer DashboardLights</i></p> <pre> DashboardLights ^= 0x0c; </pre>