


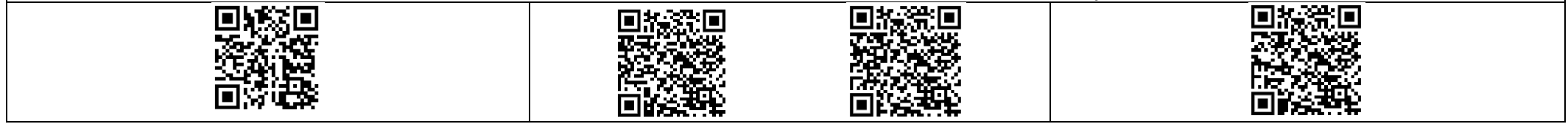
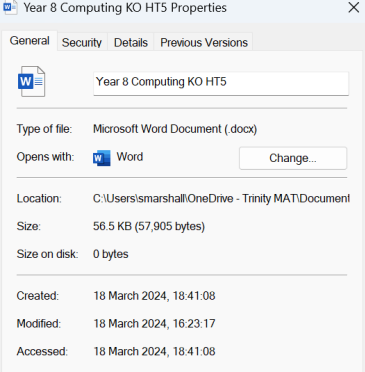


Computer Science	CPU and Binary Pt.2	Year 9	Term 5
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Week 1: Web Design Recap	Week 2: CPU Instructions and Logic Gates	Week 3: Binary addition and overflow																																
<p>Dreamweaver is a desktop web development application. It will let you create brand new websites from scratch, or use templates.</p>	<p>The CPU is the brain of the computer. It is made up of millions of individual circuits known as transistors.</p>	<p>We can convert a binary number to decimal using a binary conversion table:</p> <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <tr> <td style="text-align: center;">128</td> <td style="text-align: center;">64</td> <td style="text-align: center;">32</td> <td style="text-align: center;">16</td> <td style="text-align: center;">8</td> <td style="text-align: center;">4</td> <td style="text-align: center;">2</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="height: 20px;"></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	128	64	32	16	8	4	2	1																								
128	64	32	16	8	4	2	1																											
<p>Hyperlinks are how we can link together different web pages, different documents, or even just different parts of the same pages.</p>	<p>These transistors are all pieced together to work in different ways. These are called logic gates.</p> <div style="text-align: center; margin: 10px 0;">    </div>	<p>To calculate a decimal number from this table, we look at which numbers have a 1 underneath them:</p> <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <tr> <td style="text-align: center;">128</td> <td style="text-align: center;">64</td> <td style="text-align: center;">32</td> <td style="text-align: center;">16</td> <td style="text-align: center;">8</td> <td style="text-align: center;">4</td> <td style="text-align: center;">2</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> </tr> </table> <p>128 + 2 = 130. 1000010 = 130</p>	128	64	32	16	8	4	2	1	1	0	0	0	0	0	1	0																
128	64	32	16	8	4	2	1																											
1	0	0	0	0	0	1	0																											
<p>HTML is the code that we use to format web pages and create the basic structures of them.</p>	<p>When a logic gate gives an output, or is turned ON, we use the number 1 to represent this.</p>	<p>You can actually add to binary numbers together in what is called binary addition.</p>																																
<p>When we want to break up our web pages, we can use something called divisions.</p> <p>Divisions are useful, as they let you create individual parts of a page, each of which can be then formatted separately.</p>	<p>When a logic gate gives no output, or is turned OFF, we use the number 0 to represent this.</p>	<p>It works by using long addition that you will have used in Maths:</p> <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <tr> <td style="text-align: center;">0</td><td style="text-align: center;">1</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td><td style="text-align: center;">0</td><td style="text-align: center;">1</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">1</td><td style="text-align: center;">0</td><td style="text-align: center;">0</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td><td style="text-align: center;">0</td> </tr> <tr> <td colspan="8" style="text-align: right; border: none;">+</td> </tr> <tr> <td style="text-align: center;">1</td><td style="text-align: center;">1</td><td style="text-align: center;">1</td><td style="text-align: center;">1</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td> </tr> </table> <p style="text-align: center; margin-top: 5px;">Remember to carry the 1s!</p>	0	1	1	0	0	1	1	0	1	0	0	1	0	1	0	0	+								1	1	1	1	1	0	1	0
0	1	1	0	0	1	1	0																											
1	0	0	1	0	1	0	0																											
+																																		
1	1	1	1	1	0	1	0																											
<p>Tags are the specific individual pieces of HTML code.</p> <p>Examples include: <code><html></html></code> <code><body></body></code> <code><head></head></code></p>	<p>We can create numbers by creating a string of binary numbers, also known as a binary sequence.</p>	<p>Sometimes the carried digits end up running past the Bytes of data that you are adding together, and you end up with an extra binary digit:</p> <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <tr> <td style="text-align: center;">1</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td><td style="text-align: center;">0</td><td style="text-align: center;">1</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td><td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: center;">1</td><td style="text-align: center;">0</td><td style="text-align: center;">0</td><td style="text-align: center;">0</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td><td style="text-align: center;">0</td><td style="text-align: center;">0</td> </tr> <tr> <td colspan="8" style="text-align: right; border: none;">+</td> </tr> <tr> <td style="text-align: center;">1</td><td style="text-align: center;">0</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td> </tr> </table>	1	1	0	0	1	1	0	1	1	0	0	0	1	0	0	0	+								1	0	1	0	1	0	1	0
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1	0	0	0	1	0	0	0																											
+																																		
1	0	1	0	1	0	1	0																											
<p>CSS stands for Cascading Style Sheets. They are a piece of code that we can load alongside our HTML code in order to format the pages.</p>		<p>This extra digit would create an error, as the computer would expect to only have 8 binary digits in the answer. This is called an overflow error.</p>																																

Extension QR Codes – Follow the links to find out information on screens, resolution, pixels and more.



Week 4: Binary shifts	Week 5 & 6: Assessment Prep	Week 7: Metadata																																		
<p>As well as adding binary, we can move a binary digit left or right. This is called a binary shift.</p>	<p>SDLC is the software development life cycle. It is the cycle that all software goes through when it is being created.</p>	<p>File data is the actual contents of a file. If you are working on a Word document it would be the individual words. If you were working on an image it would be the pixels that make up the picture.</p>																																		
<p>We move binary shifts one place to the left, or one place to the right. This means we move the binary numbers in the binary conversion table all one to the left, or all one to the right.</p>	<p>When two or more computers are connected together to share data and hardware it is called a network. Networks are important as they allow us to easily share resources with one another.</p>	<p>We need other important data about a file though: what are the dimensions of the page/document? What fonts are used? What character set. This data is called metadata.</p>																																		
<p>This is a binary shift one space to the left. You can see that the number has actually been multiplied by two:</p> <table border="1" data-bbox="129 544 618 611"> <tr><td>128</td><td>64</td><td>32</td><td>16</td><td>8</td><td>4</td><td>2</td><td>1</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td></tr> </table> <p style="text-align: right;">40</p> <table border="1" data-bbox="69 624 618 691"> <tr><td>256</td><td>128</td><td>64</td><td>32</td><td>16</td><td>8</td><td>4</td><td>2</td><td>1</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> </table> <p style="text-align: right;">80</p>	128	64	32	16	8	4	2	1	0	0	1	0	1	0	0	0	256	128	64	32	16	8	4	2	1	0	0	1	0	1	0	0	0	0	<p>The Internet is a global network of networks that communicate using the internetworking protocol (IP)</p>	<p>You can see a lot of the metadata for a file by right-clicking on it and selecting properties:</p> 
128	64	32	16	8	4	2	1																													
0	0	1	0	1	0	0	0																													
256	128	64	32	16	8	4	2	1																												
0	0	1	0	1	0	0	0	0																												
<p>This is a binary shift one space to the right. You can see that the number has actually been divided by two:</p> <table border="1" data-bbox="118 770 618 837"> <tr><td>128</td><td>64</td><td>32</td><td>16</td><td>8</td><td>4</td><td>2</td><td>1</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td></tr> </table> <p style="text-align: right;">40</p> <table border="1" data-bbox="181 857 618 924"> <tr><td>64</td><td>32</td><td>16</td><td>8</td><td>4</td><td>2</td><td>1</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td></tr> </table> <p style="text-align: right;">20</p>	128	64	32	16	8	4	2	1	0	0	1	0	1	0	0	0	64	32	16	8	4	2	1	0	0	1	0	1	0	0	<p>The World Wide Web, or WWW, is a global connection of web pages that are all linked together using hyperlinks.</p>					
128	64	32	16	8	4	2	1																													
0	0	1	0	1	0	0	0																													
64	32	16	8	4	2	1																														
0	0	1	0	1	0	0																														
<p>So a binary shift to the left is the same as multiplication.</p>	<p>Computers are devices that take instructions, process them, then output them.</p>																																			
<p>And a binary shift to the right is the same as division.</p>	<p>There are many different types of computer, all of which are designed for different tasks. Smartphones for example are designed to be used to make contact with people and use apps and games. A desktop computer however is more powerful and can be used for more advanced work.</p>	<p>Metadata also contains information such as the person who create the file, the person who last saved it, even the time and date of each change.</p>																																		
	<p>You can also change some of the metadata of a file, though this is not recommended unless you know what you are doing.</p>																																			
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