Crash Course Computer Science #4: Representing Numbers and Letters with Binary

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| --- | --- | --- | --- |
| Name: |  | Date: |  |

# Instructions

Watch *Crash Course Computer Science #4: Representing Numbers and Letters with Binary* on YouTube first. Then answer the following questions. Try to answer the question without looking at the video, but re-watch the video or parts of it if you cannot remember the answer.

1. How many possible values are there in Base-Ten Notation?
2. 9
3. 10
4. 3
5. 2
6. In decimal notation, the number places are: ones, tens, hundreds, thousands, ten-thousands, etc. What are the first 5 places in the binary notation?
	* + 1. \_\_\_\_\_\_\_\_
			2. \_\_\_\_\_\_\_\_
			3. \_\_\_\_\_\_\_\_
			4. \_\_\_\_\_\_\_\_
			5. \_\_\_\_\_\_\_\_
7. Convert the binary number 1100101 to decimal:

\_\_\_\_\_\_\_\_\_\_\_

1. Convert the binary number 1001111 to decimal:

\_\_\_\_\_\_\_\_\_\_\_\_

1. Convert the number 498 to binary:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Convert the number 211 to binary:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Add these two binary numbers together:

 10010

+ 11011

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What is the smallest unit of binary data called?
	1. Nibble
	2. Word
	3. Letter
	4. Bit
2. Complete the table below for prefix names:

|  |  |
| --- | --- |
| Size | Prefix |
| “million” |  |
| “billion” |  |
| “trillion” |  |

1. How are negative numbers represented in a binary number?

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1. What is a floating-point number?

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1. How are floating point numbers represented in binary?

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1. What was the original standard that dictated how letters could be encoded as digits?

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1. How big was the standard (in bits)?

\_\_\_\_\_\_\_\_\_\_

1. What was the limitation of this standard?

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1. What was the updated, internationally-compatible standard for encoding letters and symbols called?

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1. How large is this standard (in bits)?

\_\_\_\_\_\_\_\_\_\_

1. Using the table on the next page, write your name in binary:

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1. Complete the Truth Table for XOR:

|  |  |  |
| --- | --- | --- |
| INPUT A | INPUT B | OUTPUT |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

1. What is “XOR” short for? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What is the word that means, “using ideas to represent lower layers of detail”?

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1. Why is the concept of #11 important in Computer Science?

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