# Pair Exercise: Binary Numbers

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**Binary Numbers Lab**                **Name:**

- Form groups of two and solve the problem stated below.
- Each group member should work individually and compare results with their team members.

**binary problems.png**

**Ascii Table**

| Dec | Hex | Char | Dec | Hex | Char | Dec | Hex | Char | Dec | Hex | Char |
|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|
| 0 | 00 | Null | 32 | 20 | Space | 64 | 40 | @ | 96 | 60 | ` |
| 1 | 01 | Start of heading | 33 | 21 | ! | 65 | 41 | A | 97 | 61 | a |
| 2 | 02 | Start of text | 34 | 22 | " | 66 | 42 | B | 98 | 62 | b |
| 3 | 03 | End of text | 35 | 23 | # | 67 | 43 | C | 99 | 63 | c |
| 4 | 04 | End of transmit | 36 | 24 | $ | 68 | 44 | D | 100 | 64 | d |
| 5 | 05 | Enquiry | 37 | 25 | % | 69 | 45 | E | 101 | 65 | e |
| 6 | 06 | Acknowledge | 38 | 26 | & | 70 | 46 | F | 102 | 66 | f |
| 7 | 07 | Audible bell | 39 | 27 | ' | 71 | 47 | G | 103 | 67 | g |
| 8 | 08 | Backspace | 40 | 28 | ( | 72 | 48 | H | 104 | 68 | h |
| 9 | 09 | Horizontal tab | 41 | 29 | ) | 73 | 49 | I | 105 | 69 | i |
| 10 | 0A | Line feed | 42 | 2A | * | 74 | 4A | J | 106 | 6A | j |
| 11 | 0B | Vertical tab | 43 | 2B | + | 75 | 4B | K | 107 | 6B | k |
| 12 | 0C | Form feed | 44 | 2C | , | 76 | 4C | L | 108 | 6C | l |
| 13 | 0D | Carriage return | 45 | 2D | − | 77 | 4D | M | 109 | 6D | m |
| 14 | 0E | Shift out | 46 | 2E | . | 78 | 4E | N | 110 | 6E | n |
| 15 | 0F | Shift in | 47 | 2F | / | 79 | 4F | O | 111 | 6F | o |
| 16 | 10 | Data link escape | 48 | 30 | 0 | 80 | 50 | P | 112 | 70 | p |
| 17 | 11 | Device control 1 | 49 | 31 | 1 | 81 | 51 | Q | 113 | 71 | q |
| 18 | 12 | Device control 2 | 50 | 32 | 2 | 82 | 52 | R | 114 | 72 | r |
| 19 | 13 | Device control 3 | 51 | 33 | 3 | 83 | 53 | S | 115 | 73 | s |
| 20 | 14 | Device control 4 | 52 | 34 | 4 | 84 | 54 | T | 116 | 74 | t |
| 21 | 15 | Neg. acknowledge | 53 | 35 | 5 | 85 | 55 | U | 117 | 75 | u |
| 22 | 16 | Synchronous idle | 54 | 36 | 6 | 86 | 56 | V | 118 | 76 | v |
| 23 | 17 | End trans. block | 55 | 37 | 7 | 87 | 57 | W | 119 | 77 | w |
| 24 | 18 | Cancel | 56 | 38 | 8 | 88 | 58 | X | 120 | 78 | x |
| 25 | 19 | End of medium | 57 | 39 | 9 | 89 | 59 | Y | 121 | 79 | y |
| 26 | 1A | Substitution | 58 | 3A | : | 90 | 5A | Z | 122 | 7A | z |
| 27 | 1B | Escape | 59 | 3B | ; | 91 | 5B | [ | 123 | 7B | { |
| 28 | 1C | File separator | 60 | 3C | < | 92 | 5C | \ | 124 | 7C | | |
| 29 | 1D | Group separator | 61 | 3D | = | 93 | 5D | ] | 125 | 7D | } |
| 30 | 1E | Record separator | 62 | 3E | > | 94 | 5E | ^ | 126 | 7E | ~ |
| 31 | 1F | Unit separator | 63 | 3F | ? | 95 | 5F | _ | 127 | 7F | □ |

## Find the Punchline!

For each row in the table below find the resulting decimal value. Use the ASCII table above to find the corresponding letter for that decimal value. After all letters have been discovered, finish the following joke using your result:

*Two bytes meet. The first byte asks, "Are you ill?" The second byte replies, _____.*

| Binary | Decimal | Char |
|---|---|---|
| 01101110<br>& 10100010 | | |
| 01001110 | | |
| 11001001<br>^ 10100110 | | |
| 00001011 << 2 | | |
| 10101010<br>^ 10001010 | | |
| 11010100 >>> 1 | | |
| 01100001<br>\| 00110101 | | |
| 01110011 | | |
| ~10001011 | | |
| 00000001 << 5 | | |
| 01100110 | | |
| 00110011<br>+ 00110010 | | |
| 01110011<br>^ 00010110 | | |
| 00101000<br>\| 01100100 | | |

| Binary | Decimal | Char |
|---|---|---|
| 01101001 | | |
| 00101100<br>\| 01000110 | | |
| 01111111<br>& 11100111 | | |
| 00000100 << 3 | | |
| 01100001 | | |
| 01000000 >> 1 | | |
| ~10011101 | | |
| 01101001 | | |
| 01100010<br>+ 00010010 | | |
| 10100010<br>& 01110001 | | |
| 11000001<br>^ 10101110 | | |
| 01000101<br>+ 00100001 | | |
| ~10011001 | | |
| 00101110 | | |
| 10001000 >>> 2 | | |

**Submission:**   To submit this assignment you can place your answers for the binary column ONLY in the text entry box below, upload a photo of your completed work, or upload a file(word doc, notepad, textpad, etc) that contains the work.  You do not need to fill out the Decimal or Char columns.

**Points**   10

**Submitting**   a text entry box or a file upload

| Due | For | Available from | Until |
|---|---|---|---|

| Due | For | Available from | Until |
|-----|-----|----------------|-------|
| Apr 12 | Everyone | - | - |

+ **Rubric**