
Problem 3. Write each of the following in base-2, base-8, base-10, and base-16 (use the subscript to indicate what base you are using). For example:

$$10_{10} = 1010_2 = 12_8 = 10_{10} = A_{16}$$

(a) 11_{10}

(b) 100110_2

(c) FF_{16}

Problem 4. Taken off.

Problem 5. *Simplify, in base-16:*

(a) $9FC + 4$

(b) $2143 * 4$

(c) $100 - 2$

Problem 6. *Simplify, in base-8:*

(a) $3 * (7 + 2)$

(b) $7*6$

(c) $-362 + 3126$

Problem 7. The basic standard way to encode letters is the ASCII format. The chart below tells you how each letter is represented, in base-16:

| ASCII Chart | | | | | | | | | | | | | | | | |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|----|----|-----|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
| 0 | NUL | SOH | STX | ETX | EOT | ENQ | ACK | BEL | BS | HT | LF | VT | FF | CR | SO | SI |
| 1 | DLE | DC1 | DC2 | DC3 | DC4 | NAK | SYN | ETB | CAN | EM | SUB | ESC | FS | GS | RS | US |
| 2 | SP | ! | " | # | \$ | % | & | ' | (|) | * | + | , | - | . | / |
| 3 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | : | ; | < | = | > | ? |
| 4 | @ | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| 5 | P | Q | R | S | T | U | V | W | X | Y | Z | [| \ |] | ^ | _ |
| 6 | ` | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o |
| 7 | p | q | r | s | t | u | v | w | x | y | z | { | | } | ~ | DEL |

For example, the letter *A* is represented by $41_{16} = 65_{10}$, while the letter *a* is represented by $61_{16} = 97_{10}$. The first two rows are special characters, mostly not in use. “SP” means the space character “ ”.

(a) Write the following ASCII message using the correct letters:

$48\ 45\ 4C\ 4C\ 4F\ 20\ 57\ 4F\ 52\ 4C\ 44\ 21$

(b) Write the following in ASCII code:

“Hello world!”

(c) Taken off.