

CS315 2025F Lab04 Exam Problems Solutions

Question 1 - Hex to Decimal

Convert the hexadecimal number 0x3FA to decimal. Show your work.

A-10 B-11 C-12 D-13 E-14 F-15

$$3 \times (16^2) + 15 \times (16^1) + 10 \times (16^0)$$
$$3 \times 256 + 15 \times 16 + 10$$
$$768 + 240 + 10 = \boxed{1018}$$

$$\begin{array}{r} 11 \\ 256 \\ \times 3 \\ \hline 768 \end{array} \quad \begin{array}{r} 3 \\ 16 \\ \times 15 \\ \hline 190 \\ 160 \\ \hline 240 \end{array}$$

Question 2 - Binary to Decimal

Convert the binary number 0b10110 to decimal. Show your work.

$$1 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 0 \times 2^0$$
$$16 + 0 + 4 + 2 + 0 = \boxed{22}$$

Question 3 - Decimal to Binary

Convert the decimal number 231 to binary. Show your work.

① $231 \% 2 = 1$ ② $115 \% 2 = 1$ ③ $57 \% 2 = 1$ ④ $28 \% 2 = 0$
 $231 / 2 = 115$ $115 / 2 = 57$ $57 / 2 = 28$ $28 / 2 = 14$
⑤ $14 \% 2 = 0$ ⑥ $7 \% 2 = 1$ ⑦ $3 \% 2 = 1$ ⑧ $1 \% 2 = 1$
 $14 / 2 = 7$ $7 / 2 = 3$ $3 / 2 = 1$ $1 / 2 = 0$

DONE

ANS: 0b11100111

Check: $128 + 64 + 32 + 4 + 2 + 1 = 231$

Question 4 - Bad string_to_int()

Consider the following incorrect implementation of string_to_int():

```
int string_to_int(char *s) {  
    int result = 0;  
    for (int i = 0; s[i] != '\0'; i++) {  
        result = result * 10 + s[i];  
    }  
    return result;  
}
```

This is the ASCII code. We need to convert the ASCII code to an int: $result = result * 10 + (s[i] - '0');$