

Assignment 2

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August 2022

1. C expression that yields a word consisting of the least significant byte of x and the remaining bytes of y , given 2 unsigned ints x and y :

$$(x \& 0x000000FF) | (y \& 0xFFFFFFFF00)$$

where, $(x \& 0x000000FF)$ gives the LSB of x and $(y \& 0xFFFFFFFF00)$ gives all the bytes other than LSB combining which gives the required answer.

2. C expression that evaluates to 1 when below condition is true and 0 otherwise

A. Any bit of x equals 0 (i.e., all values of x other than when x is all 1s i.e., $0xFFFFFFFF$)

$$!(x == 0xFFFFFFFF)$$

B. Any bit in the LSB of x equals 1 (i.e., all values of x where the LSB is not 0 as $(0 \&\& 1)$ is 0 and 1 otherwise)

$$(x \& 0x000000FF) \&\& 1$$

3. IEEE 754 approximation for π has hexadecimal representation of 0x40490FDB and for 22.0/7.0 it is 0x40492492, XNOR of which is 0x00002b49 (i.e., $\frac{0}{s} \cdot \frac{00000000}{e} \cdot \frac{00000000010101101001001}{f}$). Hence the bit position at which π differs from 22.0/7.0 is the 10th bit in f (i.e., 10th bit after the decimal)