

CS240 Supplemental Practice – Bits

1) Conversions – Convert the following numbers to the base given in the question mark

a. $10001111_2 = ?_{10}$

b. $127_{10} = ?_{16}$

c. $0xFA = ?_{10}$

d. $10001111\ 01010000\ 10101011_2 = ?_{16}$

e. $10111111_2 = ?_{10}$

f. $0x23 = ?_{10}$

2) In class, we discussed an example called shift and mask that extracted the 2nd most significant byte from a 32-bit integer. Write a function in C that can extract any of the four bytes where the most significant byte is byte 3 and the least significant byte is byte 0. The function header has been provided to you where `number` is a 32-bit integer and `byteNum` is the byte to be extracted:

```
int getByte(int number, int byteNum) {  
  
  
  
  
  
  
  
  
  
}
```

3) Provide an example number in hex where this expression to extract the most significant byte could lead to an erroneous result: `(number && 0xFF000000) >> 24`. Explain how such an error could occur and whether it matters whether the shift is logical or arithmetic.