

CS5541 - Computer Systems

C Code from Assembly Exercise

For a function with prototype
`long decode2(long x, long y, long z);`
GCC generates the following code:

```
1  decode2:
2      subq    %rdx, %rsi
3      imulq   %rsi, %rdi
4      movq    %rsi, %rax
5      salq    $63, %rax
6      sarq    $63, %rax
7      xorq    %rdi, %rax
8      ret
```

Parameters x, y, and z are passed in registers %rdi, %rsi, and %rdx. The code stores the return value in register %rax.

Write C code for `decode2` that will have an effect equivalent to the assembly code shown.

```
long decode2(long x, long y, long z)
{
    long t1 = y - z;
    long t2 = x * t1;
    long t3 = (t1 << 63) >> 63;
    long t4 = t3 ^ t2;

    return t4;
}
```