CIS 2107. Quiz 5b Solutions. Name:

The quiz is out of 15 points. There are 2 pages.

1. **Move and Load Effective Address Instructions** What value would be stored in register %ebx after each of the following operations?

   - **(a) 1 point**  
     \[
     \text{movl 0x10C, %ebx}
     \]
     (a) \text{0x19}
   
   - **(b) 1 point**  
     \[
     \text{movl $0x10C, %ebx}
     \]
     (b) \text{0x10C}
   
   - **(c) 1 point**  
     \[
     \text{movl %eax, %ebx}
     \]
     (c) \text{0x100}
   
   - **(d) 1 point**  
     \[
     \text{movl (%eax), %ebx}
     \]
     (d) \text{0x2C}
   
   - **(e) 1 point**  
     \[
     \text{movl 4(%eax), %ebx}
     \]
     (e) \text{0x87}
   
   - **(f) 1 point**  
     \[
     \text{leal 4(%eax), %ebx}
     \]
     (f) \text{0x104}
   
   - **(g) 1 point**  
     \[
     \text{movl 8(%eax, %ecx, 4), %ebx}
     \]
     (g) \text{0x19}
   
   - **(h) 1 point**  
     \[
     \text{leal 8(%eax, %ecx, 4), %ebx}
     \]
     (h) \text{0x10C}
   
   - **(i) 1 point**  
     \[
     \text{leal 8(, %ecx, 4), %ebx}
     \]
     (i) \text{12}
2. Consider the following C code.

```c
int fb(int A[], int thresh, int cap) {
    int i, count=0;
    for (i=0; i<cap; i++) {
        if (A[i]>=thresh) {
            count++;
        }
    }
    return count;
}
```

which, when compiled is translated to the following assembly:

```assembly
.type fb, @function

fb:
pushl %ebp
movl %esp, %ebp

.../* several other lines here */

...movl %ebp, %esp
popl %ebp
ret
```

(a) We see the function is returning a count. Where exactly is this stored so that it can later be read by the caller?

(a) **EAX/RAX**

(b) During most of `fb`, i.e., after the mov instruction in the 2nd line of the function, but before the pop instruction at the end, the value stored in ebp is 0xFFFFD500. If it can be determined based on the information given, what is stored at each of the given addresses. If it cannot be determined, write can’t tell?

i. 0xFFFFD500?

ii. 0xFFFFD504?

iii. 0xFFFFD508?

iv. 0xFFFFD50C?

v. 0xFFFFD510?