

1 . (20分) 假设%rax、%rbx的初始值都是0. 请据汇编代码将???填写完整.
 (1)_____. (2)_____. (3)_____. (4)_____.

	%rax	%rbx
movabsq \$0x0123456789ABCDEF, %rax		
---->	0x0123456789ABCDEF	0x00000000000000000
mov(5) %ax, %bx		
---->	0x0123456789ABCDEF	(1) ????????????????
movs(6) %bx, %rbx		
---->	0x0123456789ABCDEF	(2) ????????????????
mov(7) %ebx, %eax		
---->	(3) ????????????????	(2) ????????????????
Movabsq \$0x123456789ABCDEF, %rax		
---->	0x0123456789ABCDEF	(2) ????????????????
cltq		
---->	(4) ????????????????	(2) ????????????????

并补全mov/movs指令

(5)_____ (6)_____ (7)_____

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2.  unsigned long int_sqrt(unsigned long x)
    {
        unsigned long b, m, y = 0;

        if (x <= 1)
            return x;

        m = 1UL << (BITS_PER_LONG - 2);
        while (m != 0) {
            b = y + m;
            y >>= 1;

            if (x >= b) {
                x -= b;
                y += m;
            }
            m >>= 2;
        }

        return y;
    }

```

1) 在 64 位的机器上 BITS_PER_LONG 的定义为 long 类型的二进制位数，它是多少位？

2) 填写下面反汇编中的缺失的内容：

<int_sqrt>:

```
4004c4:    push    %rbp
4004c5:    mov     %rsp,%rbp
4004c8:    mov     %rdi,-0x28(%rbp)

4004cc:    movq    (1),-0x8(%rbp)
4004d4:    cmpq    $0x1,-0x28(%rbp)

4004d9:    ja      (2) <int_sqrt+??>
4004db:    mov     -0x28(%rbp),%rax

4004df:    jmp     (3) <int_sqrt+??>
4004e1:    movl    $0x0,-0x10(%rbp)

4004e8:    movl    (4),-0xc(%rbp)

4004ef:    jmp     (5) <int_sqrt+??>
4004f1:    mov     -0x10(%rbp),%rax
4004f5:    mov     -0x8(%rbp),%rdx

4004f9:    lea     (6),%rax
4004fd:    mov     %rax,-0x18(%rbp)
400501:    shrq    -0x8(%rbp)
400505:    mov     -0x28(%rbp),%rax
400509:    cmp     -0x18(%rbp),%rax

40050d:    jb      (7) <int_sqrt+??>
40050f:    mov     -0x18(%rbp),%rax
400513:    sub     %rax,-0x28(%rbp)
400517:    mov     -0x10(%rbp),%rax
40051b:    add     %rax,-0x8(%rbp)
40051f:    shrq    (8),-0x10(%rbp)
400524:    cmpq    $0x0,-0x10(%rbp)
400529:    jne     (9) <int_sqrt+??>
40052b:    mov     -0x8(%rbp),(10)
40052f:    leaveq
400530:    retq
```

} return %rax

8. 将下列汇编代码翻译成 C 代码

<pre> func: movl \$1, %eax jmp .L2 .L4: testb \$1, %sil je .L3 imulq %rdi, %rax .L3: sarq %rsi imulq %rdi, %rdi .L2: testq %rsi, %rsi jg .L4 rep ret </pre>	<pre> // a in %rdi, b in %rsi long func(long a, long b) { long ans = _____; while (_____) { if (_____) ans = _____; b = _____; a = _____; } return ans; } </pre>
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