Homework2

BY 唐志鹏 SA23011068

3.58

```
long decode(long x, long y, long z) {
    long tmp = y - z;
    return (tmp * x) ^ (tmp << 63 >> 63);
}
```

3.60

- A
  - x的值存在%rdi，n的值存在%cl，result的值存在%rax，mask的值存在%rdx
- B
  - result初始值是0，mask初始值是1
- C
  - mask的测试条件是不为0
- D
  - mask被左移n位
- E
  - result与mask&x的结果取或
- F

```
long loop(long x, int n) {
    long result = 0;
    long mask;
    for(mask = 1; mask!=0; mask <<= n) {
        result |= (mask & x);
    }
    return result;
}
```

3.63

```
long switch_prob(long x, long n) {
    long result = x;
    switch(n) {
        case 60:
        case 62:
            result = 8 * x;
            break;
        case 63:
            result = x >> 3;
            break;
        case 64:
```

```
            result = (x << 4) - x;
            x = result;
        case 65:
            x *= x;
        default:
            result = 0x4b + x;
    }
    return result;
}
```

- `sub $0x3c, %rsi`，说明做switch跳转表的值要是n-60
- `cmp $0x5, %rsi`，跳转表的上限是5，超过就跳转0x4005c3
- 跳转表的地址是0x4006f8+8*（n-60）
  - n-60=0：0x00000000004005a1
  - n-60=1：0x00000000004005c3
  - n-60=2：0x00000000004005a1
  - n-60=3：0x00000000004005aa
  - n-60=4：0x00000000004005b2
  - n-60=5：0x00000000004005bf

3.69

```
%ecx = (*bp + 0x120)    说明last的偏移量是0x120=288
%ecx存了first和last，也就是n
%rax = 5*i
%rax = 8*5*i + *bp ，也就是*ap
%rdx = (8*5*i + *bp + 8)，也就是ap->idx
%rcx = n
(8+8 + 8*5*i + *bp  + 8*ap->idx) = n
```

- *ap的地址是40*i+8，last的地址是288，那么CNT就是7，一个a_struct的空间是40

```
struct a_struct {
    long idx;
    long x[4];
}
```

3.70

- A
  - e1.p：0
  - e1.y：8
  - e2.x：0
  - e2.next：8
- B：总共16字节
- C

```
void proc(union ele *up) {
    up->e2.x = *(up->e2.next->e1.p) - up->e2.next->e1.y;
}
```