CS5541 - Computer Systems
Machine Code Control Exercise

For a C function `switcher` with the general structure:

```c
void switcher(long a, long b, long c, long *dest)
{
    long val;
    switch(a) {
    case _____:               /* Case A */
        c = _____;
        /* Fall through */
    case _____:               /* Case B */
        val = _____;
        break;
    case _____:               /* Case C */
    case _____:               /* Case D */
        val = _____;
        break;
    case _____:               /* Case E */
        val = _____;
        break;
    default:
        val = _____;
    }
    *dest = val;
}
```

GCC generates the assembly code and jump table on the next page. Fill in the missing parts of the C code. Except for the ordering of case labels C and D, there is only one way to fit the different cases into the template.

```
void switcher(long a, long b, long c, long *dest)
a in %rdi, b in %rsi, c in %rdx, d in %rcx

switcher:
    cmpq        $7, %rdi
    ja          .L2
    jmp         *.L4(,%rdi,8)
    .section    .rodata
.L7:
    xorq        $15, %rsi
    movq        %rsi, %rdx
.L3:
    leaq        112(%rdx), %rdi
    jmp         .L6
.L5:
    leaq        (%rdx,%rsi), %rdi
    salq        $2, %rdi
    jmp         .L6
.L2:
    movq        %rsi, %rdi
.L6:
    movq        %rdi, (%rcx)
    ret


Jump Table:

.L4:
    .quad       .L3
    .quad       .L2
    .quad       .L5
    .quad       .L2
    .quad       .L6
    .quad       .L7
    .quad       .L2
    .quad       .L5
```