CS5541 - Computer Systems
Machine Code Control Exercise

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

```
void switcher(long a, long b, long c, long *dest)
{
     long val;
     switch(a) {
     case 5:              /* Case A */
          c = b ^ 15;
          /* Fall through */
     case 0:              /* Case B */
          val = c + 112;
          break;
     case 2:              /* Case C */
     case 7:              /* Case D */
          val = (c + b) << 2;
          break;
     case 4:              /* Case E */
          val = a;
          break;
     default:
          val = b;
     }
     *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, dest 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
```