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//
// Ezekiel Kim
// Lab 12
// Program to find the string length of a string.
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//
        .global String_length // program starting address

        .data

        .text

String_length:
        str     x1,     [sp,    #-16]!  // Store x1 on the stack
        str     x2,     [sp,    #-16]!  // Store x2 on the stack
        str     x19,    [sp,    #-16]!  // Store x19 on the stack
        str     x20,    [sp,    #-16]!  // Store x19 on the stack
        str     x21,    [sp,    #-16]!  // Store x19 on the stack
        str     x22,    [sp,    #-16]!  // Store x19 on the stack
        str     x23,    [sp,    #-16]!  // Store x19 on the stack
        str     x24,    [sp,    #-16]!  // Store x19 on the stack
        str     x25,    [sp,    #-16]!  // Store x19 on the stack
        str     x26,    [sp,    #-16]!  // Store x19 on the stack
        str     x27,    [sp,    #-16]!  // Store x19 on the stack
        str     x28,    [sp,    #-16]!  // Store x19 on the stack
        str     x29,    [sp,    #-16]!  // Store x19 on the stack
        str     x30,    [sp,    #-16]!  // Store x19 on the stack

        mov     x1,     #0      // Initialize the counter

        loop:
        ldrb    w2,     [x0,    x1]     // load the byte at string address
        cmp     w2,     #0              // compare value to 0
        b.eq    end                     // if it is 0, end the program
        add     x1,     x1,     #1      // add to the index
        b       loop

        end:
        mov     x0,     x1              // Return the length of the string
        ldr     x30,    [sp],   #16     // Retrive x30 from stack
        ldr     x29,    [sp],   #16     // Retrive x29 from stack
        ldr     x28,    [sp],   #16     // Retrive x28 from stack
        ldr     x27,    [sp],   #16     // Retrive x27 from stack
        ldr     x26,    [sp],   #16     // Retrive x26 from stack
        ldr     x25,    [sp],   #16     // Retrive x25 from stack
        ldr     x24,    [sp],   #16     // Retrive x24 from stack
        ldr     x23,    [sp],   #16     // Retrive x23 from stack
        ldr     x22,    [sp],   #16     // Retrive x22 from stack
        ldr     x21,    [sp],   #16     // Retrive x21 from stack
        ldr     x20,    [sp],   #16     // Retrive x20 from stack
        ldr     x19,    [sp],   #16     // Retrive x19 from stack
        ldr     x2,     [sp],   #16     // Retrive x2 from stack
        ldr     x1,     [sp],   #16     // Retrive x1 from stack
        ret

        .end
```