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//
// Ezekiel Kim
// Lab 14
// Subroutine to find the factorial
// Ezekiel Kim
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//
.global fact // Provide program starting address

.data

.text

fact:
    stp    x29,    x30,    [sp, #-16]!    // Save x29 and x30 on the stack
    stp    x19,    x20,    [sp, #-16]!    // Save x19 and x20 on the stack

    cmp    x0,     #0      // Check if x0 is 0
    b.eq   return
    mov    x19,    x0      // Store x0 into x19
    sub    x0,     x0,     #1      // Subtract 1 from x0
    bl     fact          //
    mul    x0,     x19,    x0      // Return n * fact(n-1)
    bl     end

return:
    mov    x0,     #1      // Store 1 into x0
    bl     end

end:
    ldp    x19,    x20,    [sp],    #16    // Load back onto registers x19 and x20
    ldp    x29,    x30,    [sp],    #16    // Load back onto registers x29 and x30
    ret

.end
```