fact

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1 Nested procedures

```
int
fact (int n)
{
    if (n < 1)
        return (1);
    return (n * fact(n - 1));
}
```

```
fact:
    addi $sp, $sp, -8      # adjust stack for 2 items
    sw $ra, 4($sp)         # save the return address
    sw $a0, 0($sp)         # save the argument n

    slti $t0, $a0, 1       # test for n < 1
    beq $t0, $zero, L1     # if n >= 1, go to L1

    addi $v0 , $zero, 1    # return 1
    addi $sp, $sp, 8       # pop 2 items off stack
    jr $ra                 # return to caller

L1: addi $a0, $a0, -1      # n >= 1: argument gets (n - 1)
    jal fact               # call fact with (n -1)

    lw $a0, 0($sp)         # return from jal: restore argument n
    lw $ra, 4($sp)         # restore the return address
    addi $sp, $sp, 8       # adjust stack pointer to pop 2 items
    mul $v0, $a0, $v0      # return n * fact (n - 1)
    jr $ra                 # return to the caller
```