

## Ex2

```
unsigned f(unsigned n) return (n==0) ? 1 : 2*f(n-1);
int main() unsigned x; x = f(3); return 0;
nop // to get the CMD mode of logisim to work jmpi main
f: // stack: [retAddr] n ... retAddr: 0 n: 1 ldi a,n // a == 1 add a,d // a == 1+SP == n ld a,(a) // a == a == (n) ==
n and a,a // a = (a a), Z flag is affected // Z==1 iff a==0 jzi f_t hen//n == 0//n!= 0,n > 0//elseexpr//f(n-1)//pushn-
1//regAalreadyhasndeca//a == n-1decdst(d),a//pushn-1//pushretaddrdecldia,.5+st(d),a//pushretaddr//jmpifjmpif//cl
2 * f(n - 1)jmpif,etf_t hen : ldia,1//retvalof1
f_ret : ldb,(d)//b == retAddrincdjmpb
main: // [x] x: 0 dec d // we are done allocating for the local var ldi a,3 dec d st (d),a dec d ldi a,. 5 + st (d),a jmpi f inc
d ldi b,x // b == 0 add b,d // b == x st (b),a // x = f(3) inc d // dealloc x halt
```