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COAL Assignment #03

Question: Write a recursive function to calculate the Fibonacci of a number. The number is passed as a parameter via the stack and the calculated Fibonacci number is returned in the AX register. A local variable should be used to store the return value from the first recursive call. The Fibonacci function is defined as follows:

Fibonacci(0) = 0

Fibonacci(1) = 1

Fibonacci(n) = Fibonacci(n-1) + Fibonacci(n-2)

Solution:

Code:

```
[org 0x0100]
jmp begin

output: dw 0

begin:
mov ax, 5
push ax
call ComputeFib
```

```
add sp, 2
mov [output], ax
mov ax, 0x4c00
int 0x21

ComputeFib:
push bp
mov bp, sp
sub sp, 2
mov ax, [bp+4]
cmp ax, 1
jbe simple_case
sub ax, 1
push ax
call ComputeFib
add sp, 2
mov [bp-2], ax
mov ax, [bp+4]
sub ax, 2
push ax
call ComputeFib
add sp, 2
add ax, [bp-2]
```

```
jmp finalize

simple_case:
mov ax, [bp+4]
cmp ax, 1
je fib_one
mov ax, 0
jmp finalize

fib_one:
mov ax, 1

finalize:
mov sp, bp
pop bp
ret
```

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