

# Homework 3

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### Question 1

Implement the following C code in MIPS assembly. Show the contents of the stack after the function call to the function "compare" is made. Assume that the stack pointer is originally at address 0x7FFFFFFc.

**Solution:**

Address	Value (+0)	Value (+4)	Value (+8)	Value (+12)	Value (+16)	Value (+20)	Value (+24)	Value (+28)	Value (+32)
0x7ffffe0	0	0	0	0	0	0	0	4194316	0
0x7ffff000	0	0	0	0	0	0	0	0	0
0x7ffff020	0	0	0	0	0	0	0	0	0
0x7ffff040	0	0	0	0	0	0	0	0	0
0x7ffff060	0	0	0	0	0	0	0	0	0
0x7ffff080	0	0	0	0	0	0	0	0	0

### Question 2

Implement the following C code in the table in MIPS assembly. Suppose that fib\_iter was called with n = 4, show the contents of the stack after the function call to the function "fib\_iter" is made. Assume that the stack pointer is originally at address 0x7fffffc.

**Solution:**

Address	Value (+0)	Value (+4)	Value (+8)	Value (+12)	Value (+16)	Value (+20)	Value (+24)	Value (+28)	Value (+32)
0x7ffffc0	0	0	0	0	4194368	2	1	4194368	1
0x7ffff000	1	4194368	1	0	4194324	0	1	0	0
0x7ffff020	0	0	0	0	0	0	0	0	0
0x7ffff040	0	0	0	0	0	0	0	0	0
0x7ffff060	0	0	0	0	0	0	0	0	0

### Question 3

1. Translate function f into MIPS assembly code, using the MIPS calling convention. If you need to use register \$t0 through \$t7, use the lower-numbered registers first.
2. Right before your function f of Problem 3 returns, what do you know about contents of registers \$ra, and \$sp? Keep in mind that we know what the entire function f looks like, but for function func we only know its declaration.

**Solution:**

Address	Value (+0)	Value (+4)	Value (+8)	Value (+12)	Value (+16)	Value (+20)	Value (+24)	Value (+28)	Value (+32)
0x7ffffe0	0	0	0	0	0	0	30	4194320	0
0x7ffff000	0	0	0	0	0	0	0	0	0
0x7ffff020	0	0	0	0	0	0	0	0	0
0x7ffff040	0	0	0	0	0	0	0	0	0
0x7ffff060	0	0	0	0	0	0	0	0	0
0x7ffff080	0	0	0	0	0	0	0	0	0
0x7ffff0a0	0	0	0	0	0	0	0	0	0