```
mov rax, 4
mov [rsp + -8], rax
mov rax, 8
mov [rsp + -16], rax
mov rax, 12
mov [rsp + -24], rax
mov rax, 31
mov r8, [rsp + -24]
mov [rdi + 0], r8
mov [rdi + 8], rax
mov rax, rdi
or rax, 2
add rdi, 16
mov r8, [rsp + -16]
mov [rdi + 0], r8
mov [rdi + 8], rax
mov rax, rdi
or rax, 2
add rdi, 16
mov r8, [rsp + -8]
mov [rdi + 0], r8
mov [rdi + 8], rax
mov rax, rdi
or rax, 2
add rdi, 16
mov rax, [rax + 6]
```

```
(right (pair 1 (pair 2 (pair 3 false))))
```

Registers:

rax

r8

rdi 0

Tasks:

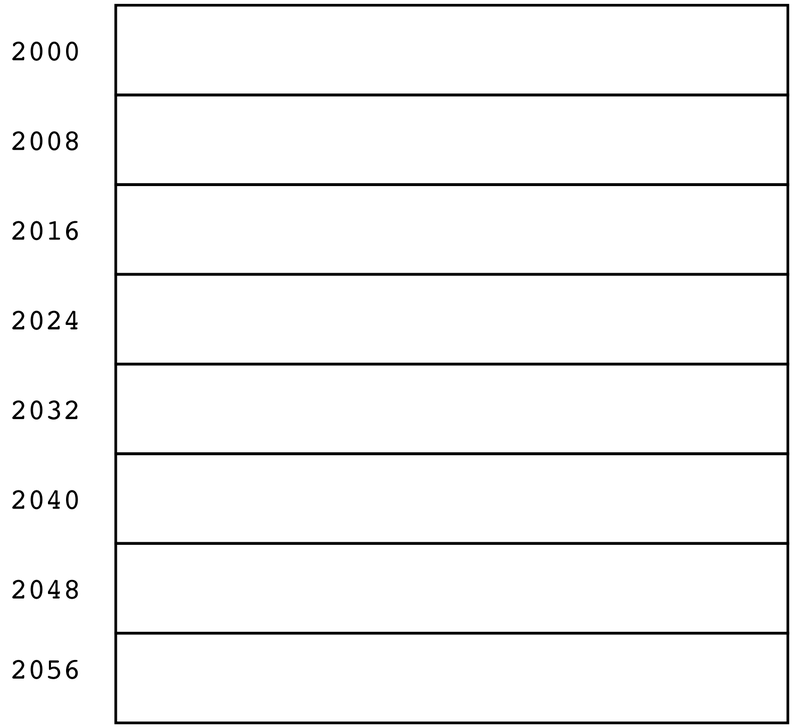
(1) Run through the assembly at the left, updating registers, heap, and stack as needed.

(2) Assuming mark-and-sweep GC begins right after the last instruction at the left, what will be the roots of GC?

---

(3) Now execute GC manually. What memory will be **marked**? In the **sweep**, what memory will be freed? (Mark on diagram.)

The heap:



The stack: