

Worksheet 4A

Quiz 1: Semantics of Blocks

Program

Result

```
(let (x 5)
  (set! x 10))
```

```
(let (x 10)
  (let (y (set! x (+ x 5)))
    (+ x y)))
```

```
(let (x 5)
  (block
    (set! x (+ x 100))
    x))
```

Quiz 2: Assembly for `set!` and `block`

Complete the assembly code for

Program

Assembly

```
(let (x 10)
  (let (y (set! x (+ x 1)))
    x))
```

```
mov rax, 20
mov [rbp - 8.1], rax
mov rax, [rbp - 8.1]
add rax, 2
```

```
(let (x 10)
  (block
    (set! x (+ x 1))
    x
  )
)
```

```
mov rax, 20
mov [rbp - 8.1], rax
mov rax, [rbp - 8.1]
add rax, 2
```

Quiz 3: Semantics of loop and break

Program

Result

```
(let (i 0)
  (loop
    (if (= i input)
      (break i)
      (set! i (+ i 1))))))
```

```
(let (res 0)
  (let (i 0)
    (loop
      (if (= i input)
          (break res)
          (block
            (set! res (+ res i))
            (set! i (+ i 1)))))))
```

Quiz 4: Assembly for loop and break

Lets *complete* the assembly code for

Program

```
(let (i 0)
  (loop
    (if (= i 5)
        (break 99)
        (set! i (+ i 1))))
```

Assembly

```
our_code_starts_here:
  mov rax, 0
  mov [rbp - 8*1], rax
```

```
_____

; < (= i 5) >
cmp rax, 1
je if_false_1
```

```
if_true_1:
_____
_____
_____
```

```
if_false_1:
; < set! i (+ i 1) >
```

```
if_exit_1:
_____
_____
```

Quiz 5: Your turn!

What is something you found confusing in today's lecture (or earlier)?