

Worksheet 9B

Quiz 1: Register Optimized Code

Program

Optimized Asm

```
(let ((a1 (+ 10 10))
      (a2 (* 2 a1))
      (a3 (* 3 a2)))
      (* 10 a3))
```

```
(let ((n (* 5 5))
      (m (* 6 6))
      (x (+ n 1))
      (y (+ m 1)))
      (+ x y))
```

```
(defn (f a)
  (let ((x (* a 2))
        (y (+ x 7)))
    y))
```

```
(defn (f a)
  (let ((x (* a 2))
        (y (+ x 7)))
    (g x y)))
```

; a --> [rbp + 16]

; a --> [rbp + 16]

Quiz 2: Conflict Graphs

Draw the **edges** between the **conflicting variables** for the code examples below

Program

Conflict Graph

```
(let ((a0 92))
      (a1 (+ a0 1))
      (a2 (+ a1 1))
      (a3 (+ a2 1))
      (a4 (+ a3 1))
      (a5 (+ a4 1)))
      a5)
```

```
a0      a1
a2      a3
a4      a5
```

```
(let ((n (* 5 5))
      (m (* 6 6))
      (x (+ n 1))
      (y (+ m 1)))
      (+ x y))
```

```
n      m
y      x
```

Quiz 3: *Live Variables*

Lets identify the live/conflicts in the quiz above: after *each semicolon* ; fill in the names of the variables **live** at that point in the program.

```

; LIVE Variables
;
(let (a0 92)
;
  (let (a1 (+ a0 1))
;
    (let (a2 (+ a1 1))
;
      (let (a3 (+ a2 1))
;
        (let (a4 (+ a3 1))
;
          (let (a5 (+ a4 1))
;
            a5))))))

```

```

; LIVE Variables
;
(let (n (* 5 5))
;
  (let (m (* 6 6))
;
    (let (x (+ n 1))
;
      (let (y (+ m 1))
;
        (+ x y))))))

```

Quiz 4: *Your turn!*

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