

## Worksheet 9A

### Quiz 1: Recursive Data

```
def range(i, j):
    if (j <= i): false else: (i, range(i+1, j))

def sum(l):
    if l == false: 0 else: l[0] + sum(l[1])

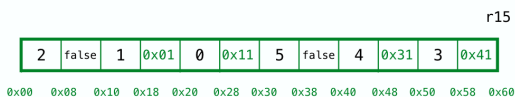
let t1 =
    let l1 = range(0, 3)
    in sum(l1)
, l = range(t1, t1 + 3)
in
(1000, l)
```

call range(3,6)



What is the value of `l` at the point indicated by the red arrow?

- a) 0x30
- b) 0x31
- c) 0x50
- d) 0x51
- e) 0x60



### Quiz 2: Live Cells

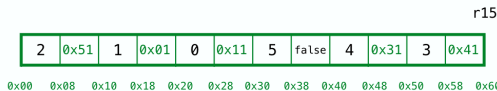
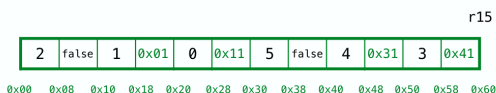
QUIZ: Which cells are "live" on the heap?

- (A) 0x00
- (B) 0x10
- (C) 0x20
- (D) 0x30
- (E) 0x40
- (F) 0x50



QUIZ: Which cells are "live" on the heap?

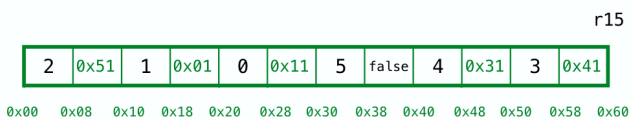
- (A) 0x00
- (B) 0x10
- (C) 0x20
- (D) 0x30
- (E) 0x40
- (F) 0x50



### Quiz 3: What should be printed?

QUIZ: What should `print(0x21)` show?

- (A) (0, (1, (2, false)))
- (B) (3, (4, (5, false)))
- (C) (0, (1, (2, (3, (4, (5, false))))))
- (D) (3, (4, (5, (0, (1, (2, false))))))
- (E) (2, (1, (0, (3, (4, (5, false))))))



## Quiz 4: Register Optimized Code

Program

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

Optimized Asm

```
(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))
```

```
; a --> [rbp + 16]
```

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

```
; a --> [rbp + 16]
```

## Quiz 5: Your turn!

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