6.035 Spring 2016 Test II

I) 1. A) mov -16(%rdi), %r10

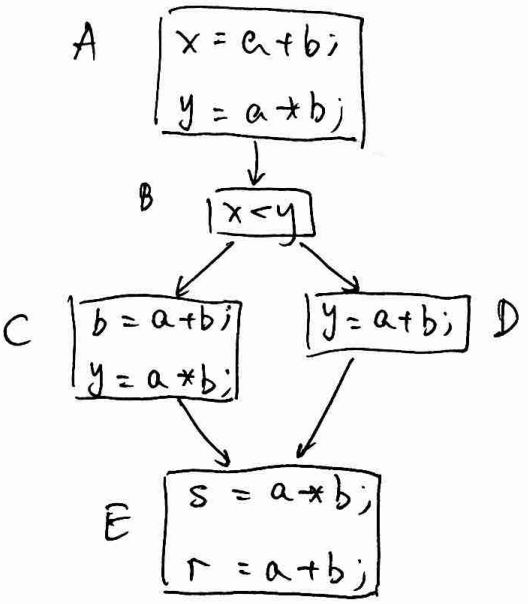
B) mov -8(%rdi), %r11

2.
```
mov -16(%rdi), %r10
mul %r10, %r10
mov -8(%rdi), %r11
mul %r11, %r11
add %r10, %r11
mov %r11, %rax
```

II) 3. A) $IN[b] = OUT[p_1] \cap \cdots \cap OUT[p_n]$

B) $OUT[b] = (IN[b] - KILL[b]) \cup GEN[b]$

4.



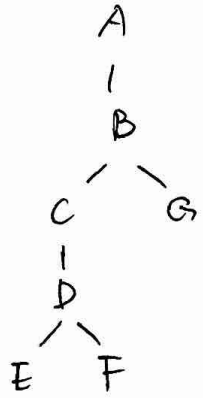
5.

b	GEN[b]	KILL[b]	IN[b]	OUT[b]
A	1 1 0	0 0 0	0 0 0	1 1 0
B	0 0 1	0 0 0	1 1 0	1 1 1
C	0 1 0	1 1 1	1 1 1	0 1 0
D	1 0 0	0 0 1	1 1 1	1 1 0
E	1 1 0	0 0 0	0 1 0	1 1 0

6. A) Yes. In blocks A and C, assign "t = y;" after "y = a*b;". In block E, replace "s = a*b;" with "s = t;"

B) No. In block C, variable b is updated after computing a+b.

III) 7.



8. 6 inner C

8 inner C

4 outer C (don't move)

IV) 9. No: live ranges overlap

Yes: could split live ranges by storing in memory

10. y (2,3) (4,5) (4,6) (7,5) (7,6)

t (6,7)

11. y w_{y_1} (2,3) w_{y_2} (4,5,6,7)

t w_t (6,7)

12. 

13. No: clique of size 3, not 2-colorable

Yes: assign y and t to the same register