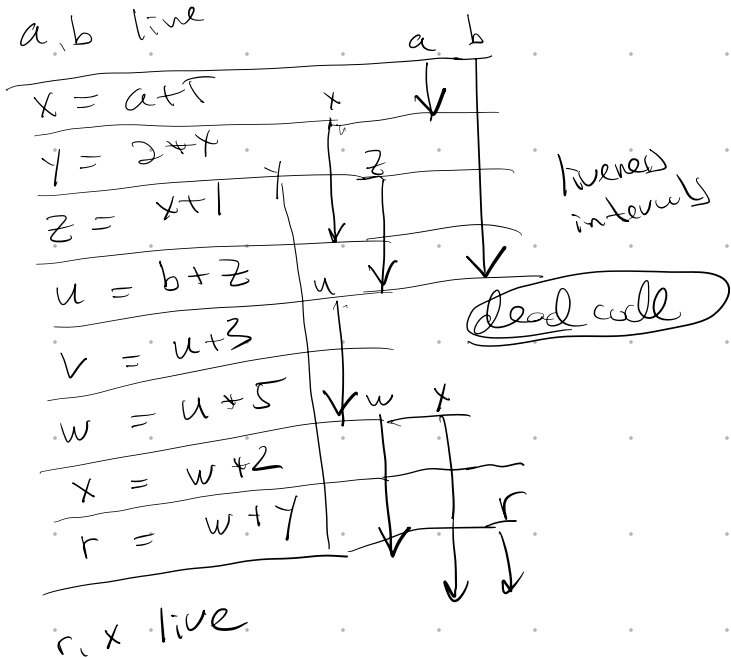
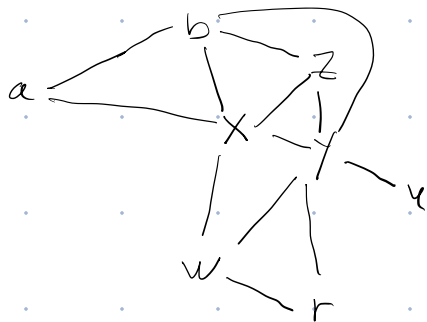


a, b live

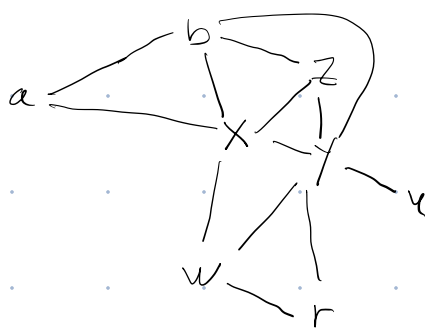


r, x live



Algorithm to color with $k=3$ colors

- (SIMPLIFY)**
- remove each node with $< k$ neighbours and push on a stack if we color the remaining graph then we can color that node
- For u, a, u, r have < 3 neighbours.

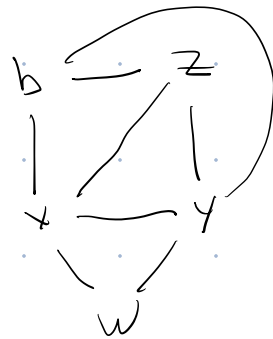


interference graph

Assume we have 3 registers. Can we "color" the nodes of the graph with 3 colors $R1, R2, R3$

So no edge connects nodes of the same color?

Stack a, u, r



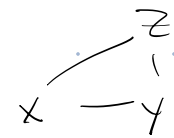
Now w has < 3 edges so push on stack

Stack a, u, r, w



(2) Spill each node has $\geq k$ edges
 So push one to put in memory
 say b

Memory b
 stack a u r v, (b)

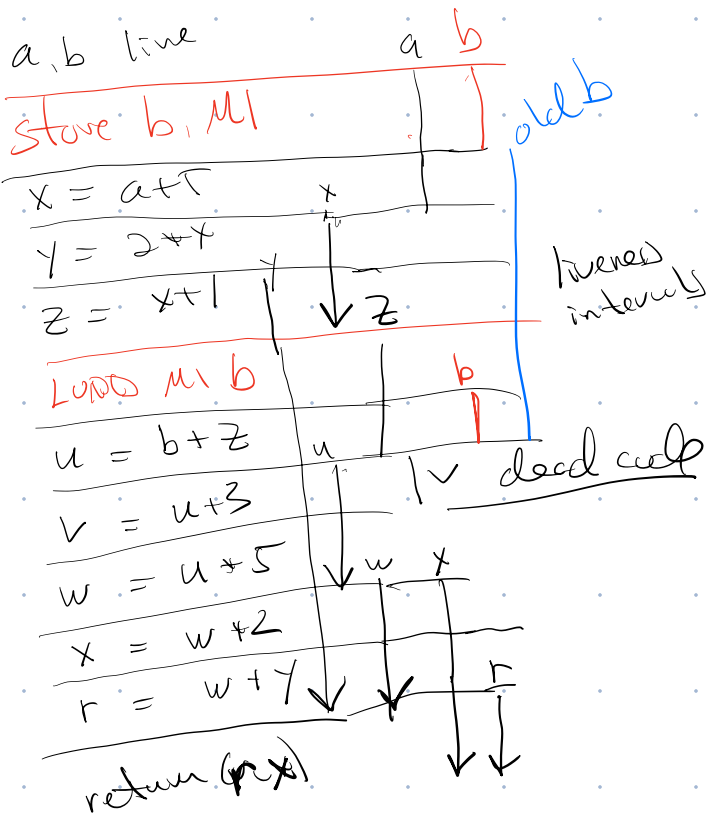
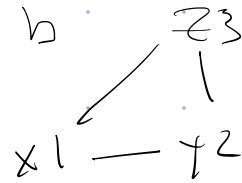


(3) Select Colors

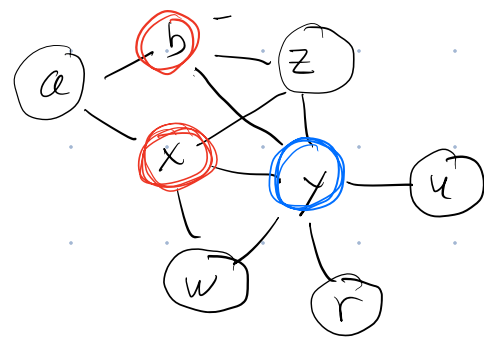
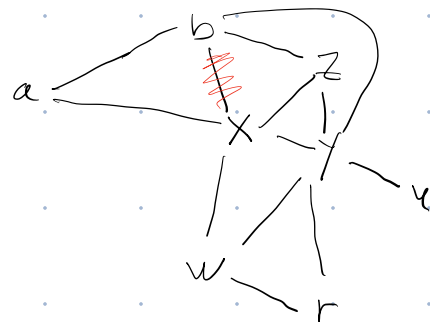
b has no register

So rewrite code to
 b stored in memory

and Start Over



statement graph



Stack
 simplify a, b, w, r, u, y, z

Rebuild graph from stack and

Select colors

R1 black
 R2 blue
 R3 red

Rewrite code with registers

a in R1

b in R3

Store R3, M1

R3 = R1 + 5

R2 = 2 * R3

R1 = R3 + 1

Load M1, R3

R1 = R3 + R1

dead code, delete

R1 = R1 * 5

R3 = R1 * 2

R1 = R1 + R2

return (r, x)

a, b live

store b, M1

x = a + 5

y = 2 * x

z = x + 1

Load M1, b

u = b + z

v = u + 3

w = u + 5

x = w + 2

r = w + y

a b

old b

liveness intervals

