

# Interference graph

Sunday, 13 February 2022 10:52 PM

①  $\text{mov } r, \$1, v$   $\{v\}$

②  $\text{mov } \$12, w$   $\{v, w\}$

③  $\text{mov } v, x$   $\{w, x\}$

④  $\text{add } \$7, x$   $\{w, x\}$

⑤  $\text{mov } x, y$   $\{w, x, y\}$

⑥  $\text{mov } x, z$   $\{w, x, y, z\}$

$\text{add } w, z$   $\{y, z\}$

$\text{mov } y, t$   $\{t, z\}$

$\text{neg } t$   $\{t, z\}$

$\text{mov } z, \%eax$   $\{t\}$

$\text{add } t, \%eax$   $\{t\}$

$\text{jmp}$   $\{t\}$

$L(R) = \{L(R+1) - w\} \cup R$

$t = 0$   
 $3 = 1$   
 $y = 2$   
 $x = 1$   
 $w = 0$   
 $v = 1$

$0 - rlx$   
 $1 - rlx$   
 $2 - rlx$

$\text{add } \%rdx, rlx$   
 $\text{mov } \%rdx, rlx$

written variables  
 $t \rightarrow \text{dest.}$   $(t, z)$

- ① movg: dest  $\Rightarrow$  {lv}, d  $\neq$  v
- ② addg:  
(atn) dest — {lv}, d  $\neq$  v
- ③ callg: caller  
saved  
reg — {lv}

# Graph color



{ 1b reg  
∞ mem

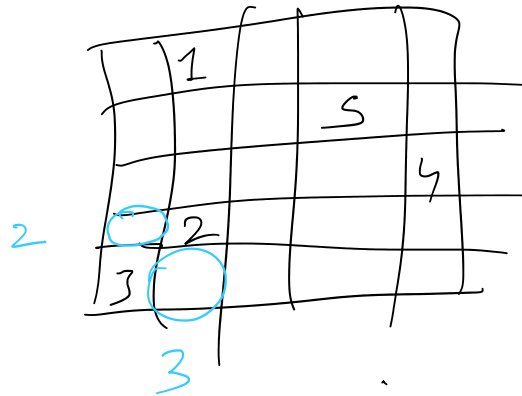
DSATUR, Brelay (1979)

## Saturation of a node

① degree?  $\times$

$V =$  list of variables

for  $v$  in  $V$

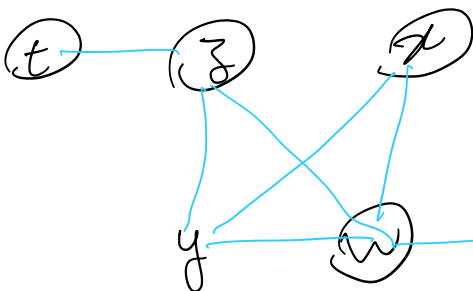


pick a node with maximal sat

find the lowest color possible,  $C$

$color[v] \leq C$

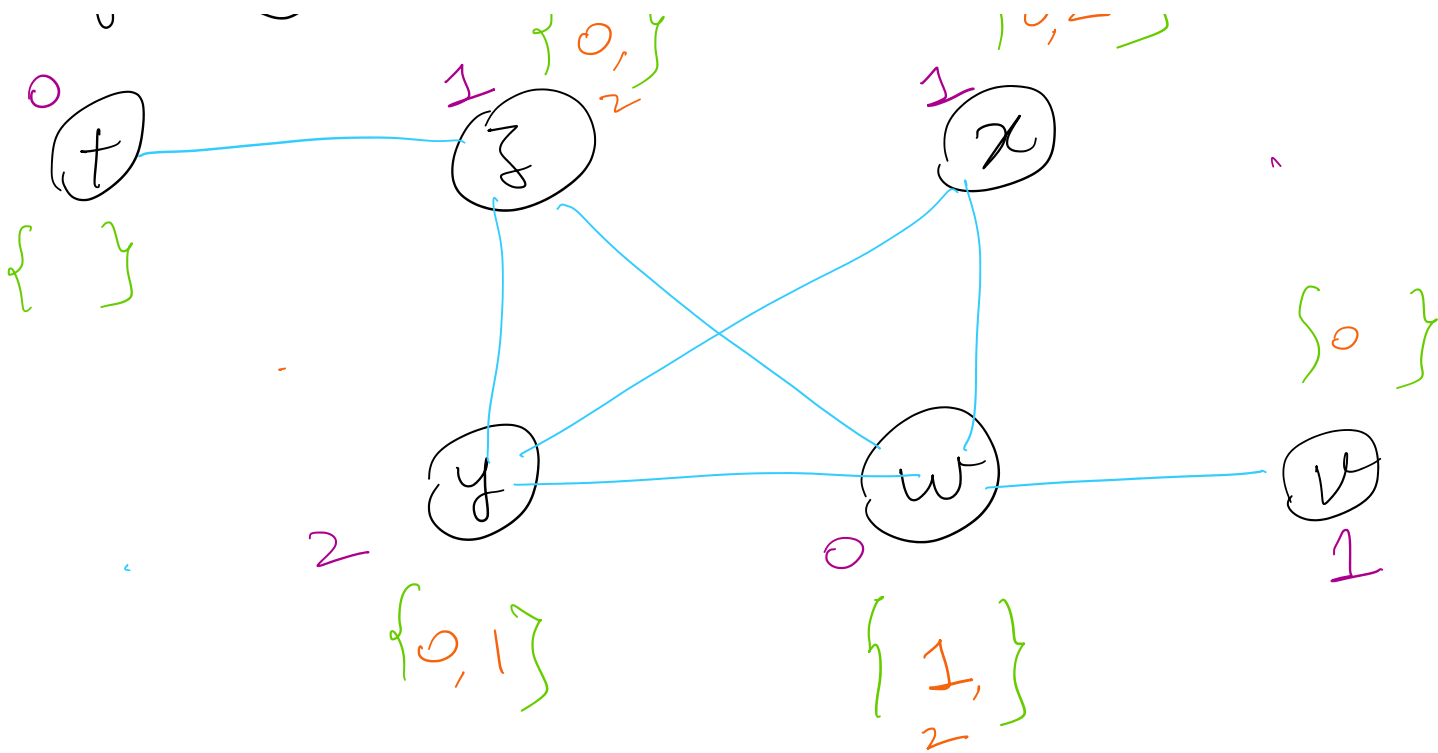
$W = \{w\} - v$



0

1 {0, 1, 2}

1 {0, 2}



raw pkg install graph

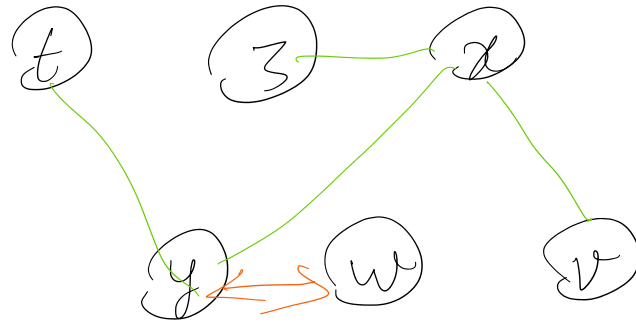
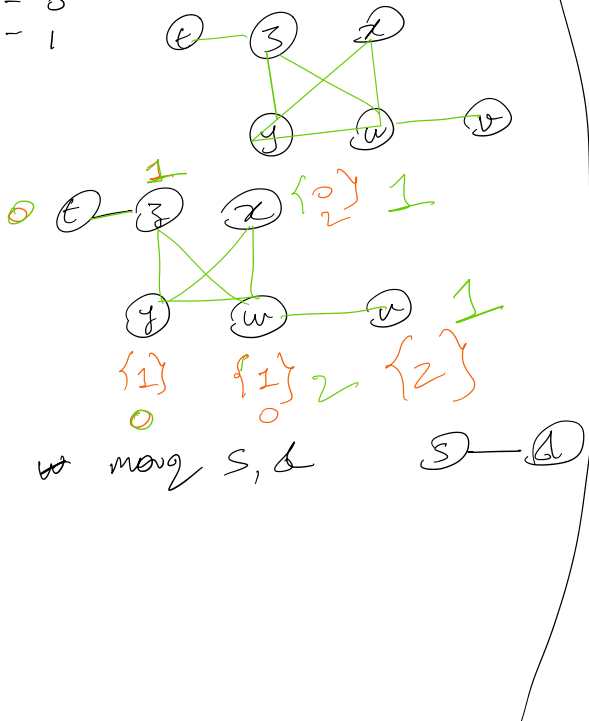
<u>16 regs</u>	<u>12</u>	<u>RSP</u>	<u>RBP</u> , <u>RAX</u>
0 - rbp		<u>R15</u>	
1 - rcx	13 -	-8(%rbp)	
2 - rsi	14 -	-16(%rbp)	
⋮		⋮	
12 - r14		⋮	

t = 0  
z = 1  
y = 2  
x = 1  
w = 0  
v = 1

movq y, t  
movq x, y  
movq x, z  
movq v, x

movq rdx, rdx

movq v, x  
movq x, y  
movq x, z  
movq y, t



DSATUR	MB
x	y
① Tie → x = 10 y = 6	

DSATUR → memory 3 m

MB → Register moves  
50 m

mov v, w