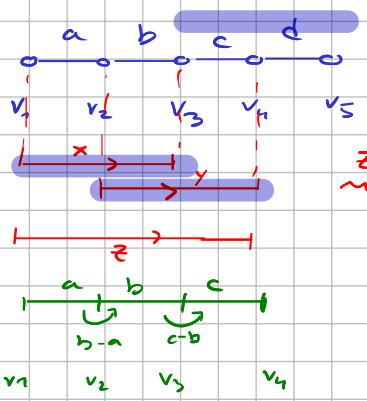


$z > y - x + 1$ → modif $z = y - x + 1$

$v_1 \to v_3$ $x = b - a + 1$

$v_2 \to v_4$ $y = c - b + 1$

$v_1 \to v_4$ $z = c - a + 1$

$\Big\{ z = y - x + 1$

$c - b = (b - a) - 1 + 1$

$D_{1,3} = 7$ $\quad D_{2,4} = 8$ $\quad D_{3,5} = 6$

(i) $(b-a) \bmod \Delta + 1 \leq 7$

$(c-b) \bmod \Delta + 1 \leq 8$

$(d-c) \bmod \Delta + 1 \leq 6$

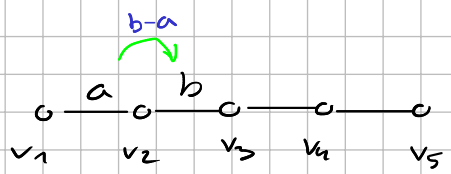
(i) $b < a$ $\quad \Delta + b - a + 1 \leq 7$

$b > a$ $\quad b - a + 1 \leq 7$

CHECK HOW TO MAKE 1 EQUATION

Symmetric D

WLOG $a < b$



$v_1 \to v_3 = b - a + 1$

$v_3 \to v_1 = a + \Delta - b + 1$

$b - a + 1 = a + \Delta - b + 1$

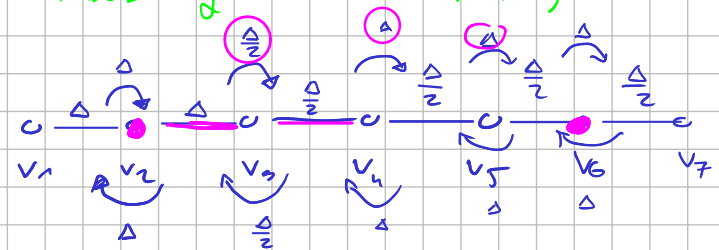
$2b - 2a = \Delta$

$2(b-a) = \Delta$

$\Delta \in \{\Delta, \frac{\Delta}{2}\}$

All labels equal or $\{\Delta, \frac{\Delta}{2}\}$.

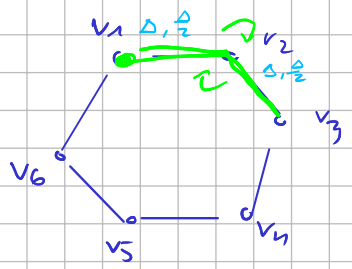
Δ = even



$v_2 \to v_6$: $\frac{\Delta}{2} + \Delta + \Delta + 1$ (via v_3, v_4, v_5)

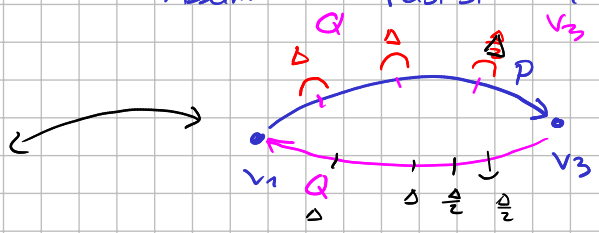
$v_6 \to v_1$: $\Delta + \Delta + \frac{\Delta}{2} + 1$ (via v_5, v_4, v_3)

$2^{|E|}$ labelings



Assume P fastest $v_1 \to v_3$

$v_3 \to v_1$



dur P = dur Q

Knowing $D_{i,j}$ gives us inf. how many $\Delta, \frac{\Delta}{2}$ are between $v_i \to v_j$

⇒ cycles, paths poly-time (check distance 2).