aaabb

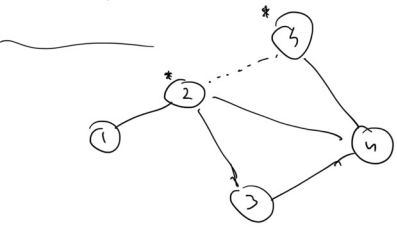
1: single letters
2: all pairs
3: ?

aaaaa a*10

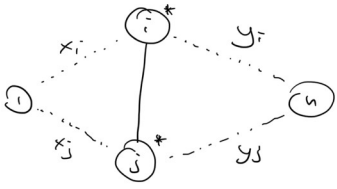
a: 5 a: 10
aa: 10 aa: 45
aaa: 4 aaa: 20

a*20

a: 20
aa: 200
aaa: 80



best to use existing road
otherwise connect $x \to y$



new path: $\min(x_i + y_j,\ x_j + y_i) + 1$

maximize $x_i + y_j$ s.t.

$x_i + y_j \le x_j + y_i$

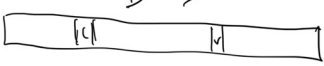
$x_i - y_i \le x_j - y_j$

$D_i \le D_j$

where $D_i = x_i - y_i$

sort by D

$D \to$



maximize $x_L + y_R$

compute prefix max x_L

1

$x = 1$
$y = 3$
$D = -2$

3

$x = 3$
$y = 1$
$D = -2$