

$S \Rightarrow "a a b d e c"$  pattern = "a b c"  
pattern frequency =  $\{a:1, b:1, c:1\}$

left = 0 right = 0  
min length = 7 (length of S, just give max no.)  
sub string str = 0

right = 0 left = 0 [a a b d e c]  
frequency =  $\{a:0, b:1, c:1\}$   
matched = 1

right = 1 left = 0 [a a b d e c]  
frequency =  $\{a:-1, b:1, c:1\}$   
matched = 1

right = 2 left = 0 [a a b d e c]  
frequency =  $\{a:-1, b:0, c:1\}$   
matched = 2

right = 3 left = 0 [a a b d e c]  
frequency =  $\{a:-1, b:0, c:1\}$   
matched = 2

matched = 2

right = 4 left = 0 [ a a b d e c ]

frequency = { a: -1, b: 0, c: 1 }

matched = 2

right = 5 left = 0 [ a a b d e c ]

frequency = { a: -1, b: 0, c: 0 }

matched = 3

matched = pattern length (3)

window will shrink

minlength = 6 [ a a b d e c ]

subStr Start = left  $\rightarrow$  0

left = 1

matched = 3

frequency = { a: 0, b: 0, c: 0 }

will shrink again (matched = pattern length)

minlength = 5 [ a a b d e c ]

subStr Start = left  $\rightarrow$  1

left = 2

matched = 2

frequency = {a: 1, b: 0, c: 0}

answer: s[subStrStart: minLength]

s[1:5]



s = a a b d e c

→ a b d e c

