





ab	aaabbb	aab	ba	abab	aa
ba	bb	baab	baa	ababaa	a

abab	aaabbb	aab	ba	ab	ab	aa
ababaa	bb	baab	baa	ba	ba	a

abab	aaabbb	aab	ba	ab	ab	aa
ababaa	bb	baab	baa	ba	ba	a

a
ab

baa
aab

then  $f(I)$  would be the *PCP* instance

$a^*$
$*a^*b$

$b^*a^*a^*$
$*a^*a^*b$

$*a^*$
$*a^*b$

$\$$
$*\$$

start	1	#
start <i>1</i>	1	#



$i$	
$1$	$i + 1$

$i$	
$\#$	$i + 1$

$$\begin{array}{c} i \\ i+k \end{array}$$

$$\begin{array}{c} i \\ i-k \end{array}$$

$i$	$i \quad 1$	$i \quad \#$
$i + 1$	$i + 2$	$i + 3$

start	1	#	2 halt	1
start 1	1	#	halt	1 2

start	1	#	3 <i>halt</i>	1	2
start 1	1	#	<i>halt</i>	1 2	# 3

1##|1#<sup>5</sup>|1<sup>3</sup>#<sup>3</sup>|1<sup>2</sup>#<sup>4</sup>|1<sup>3</sup>#<sup>4</sup>

asdf

start  start 1	1  1	#  #	7 halt  halt
1  1 2	2  # 3		
3  4	3 1  5	3 #  6	
4  7	5  3	6  3	











start	1	1	2	1	#
start 1	1 2	1	# 3	1	#
3 1	#	5	#		
5	#	3	#		
3 #	6				
6	3				
3	4	7 halt			
4	7	halt			

*start 11 21# 31# 5# 3# 6 3 4 7*

start	
start	1

start	
start	1

1	
1	2

start	
start	1

	1
1	2

start	1	1	2
start 1	1 2	1	# 3



start	1	1	2	1	#
start 1	1 2	1	# 3	1	#

start	1	1	2	1	#	
start 1	1 2	1	# 3	1	#	
3	1	#	#	4 1	#	#
# 4	1	#	#	3	#	#
3	#	#	#			
# 4	#	#	#			
4 #	#	#	4 #	#	4 #	4 halt
4	#	#	4	#	4	halt

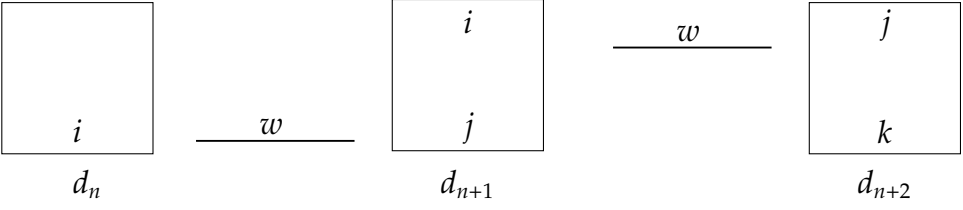
	$?$	$k$
$\dots$	$k$	$N + 1$

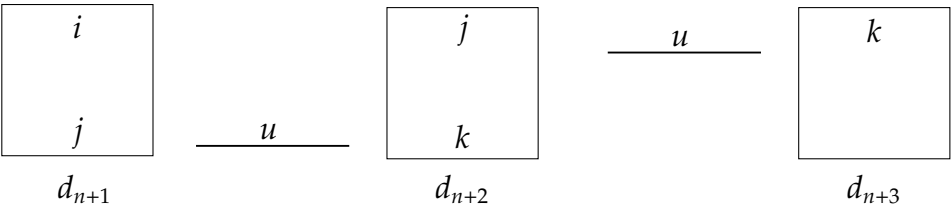
	$?$	$k$	$N + 1 \text{ } halt$
$\dots$	$k$	$N + 1$	$halt$

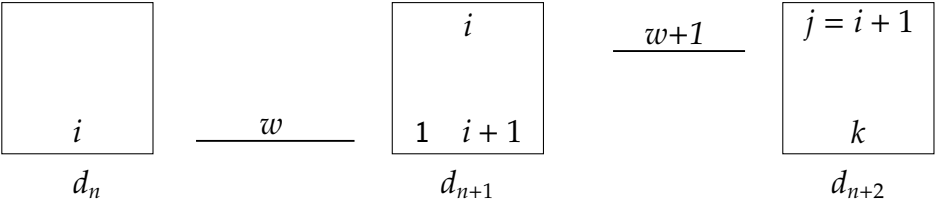
$n$
$1 \ n+1$

$n$	$1$
$n+2$	

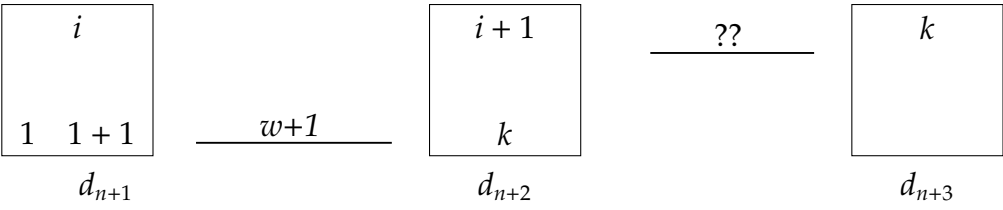
$n$	$\#$
$n+3$	

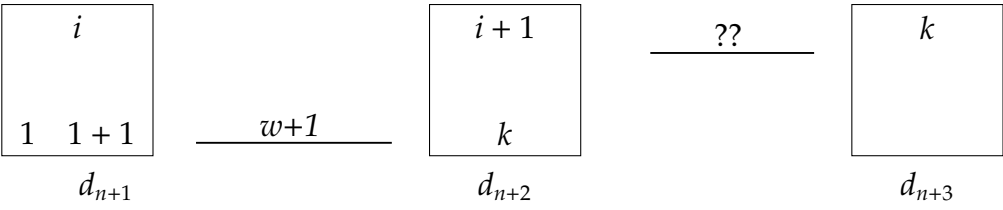


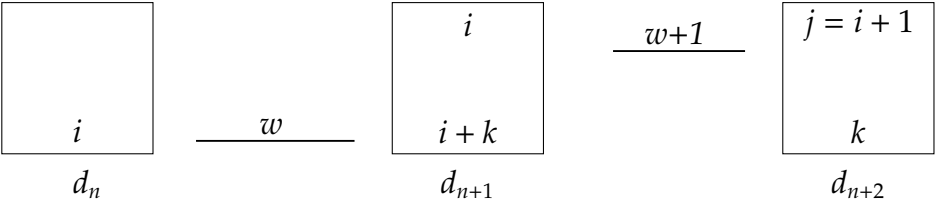






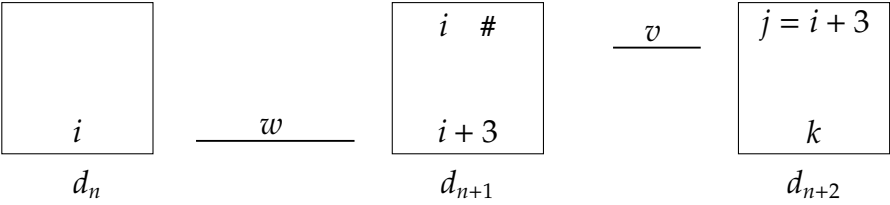


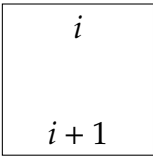


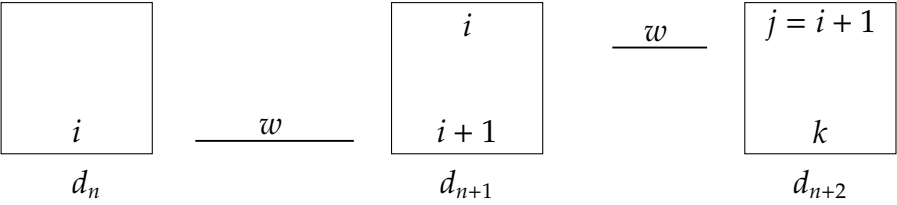


$i$	$1$
$i+2$	

$i$	$\#$
$i+3$	







start	1	#
start <i>1</i>	1	#



$i$	
$1$	$i + 1$

$i$	
$\#$	$i + 1$

$$\begin{array}{c} i \\ i+k \end{array}$$

$$\begin{array}{c} i \\ i-k \end{array}$$

$i$
$i + 1$

$i \quad 1$
$i + 2$

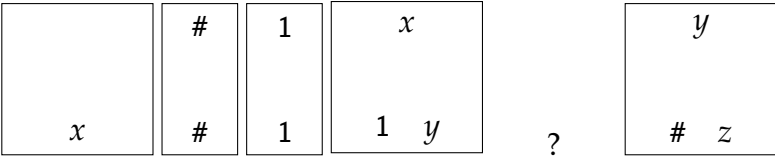
$i \quad \#$
$i + 3$



start	1	1	2	1	#
start 1	1 2	1	# 3	1	#
3	1	#	#	4 1	#
# 4	1	#	#	3	#
3	#	#	#		
# 4	#	#	#		
4 #	#	#	4 #	#	4 halt
4	#	#	4	#	4 halt

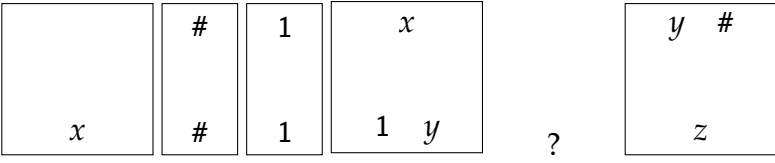
$n$
$1 \ n+1$

$n$ 1	$n$ #
next(n+2)	next(n+3)





	#	1	$x$	#	1	1	$y$
$x$	#	1	1 $y$	#	1	1	# $z$



	#	1	$x$ #		$y$
$x$	#	1	$y$	?	1 $z$