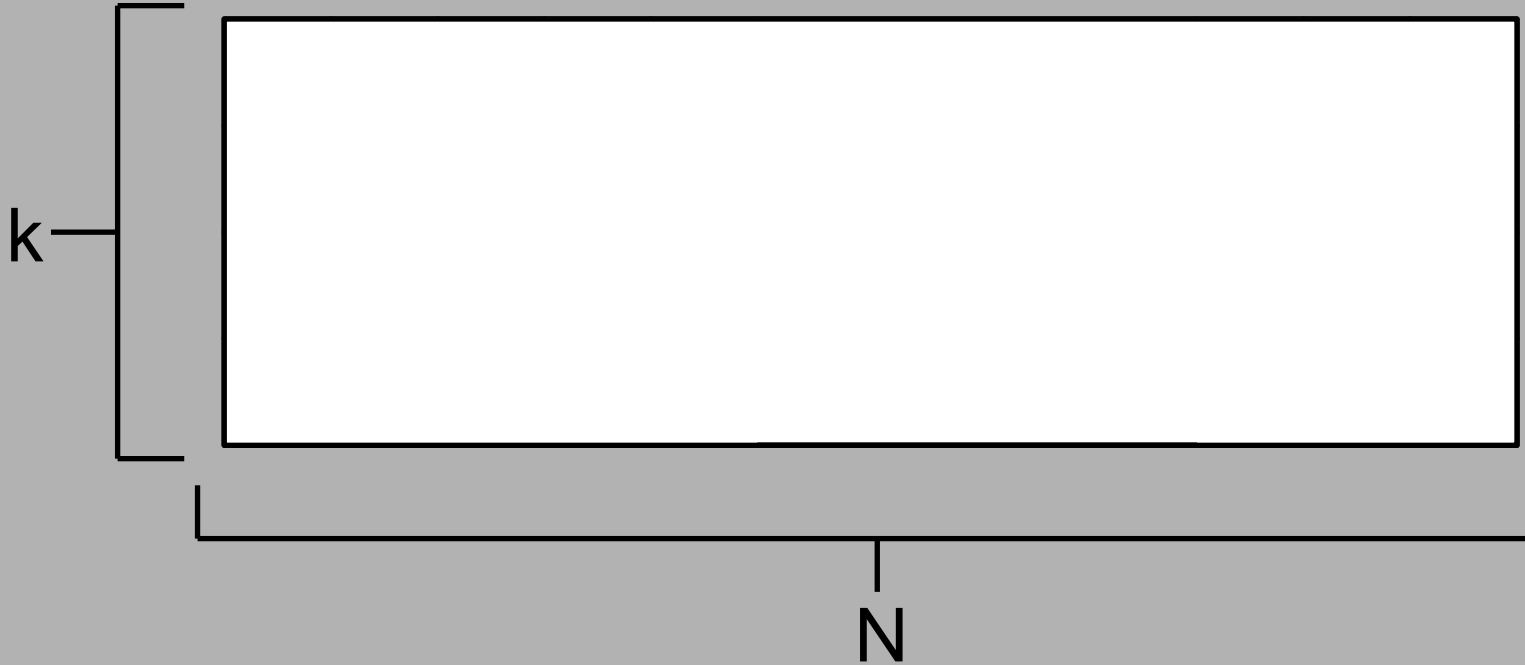


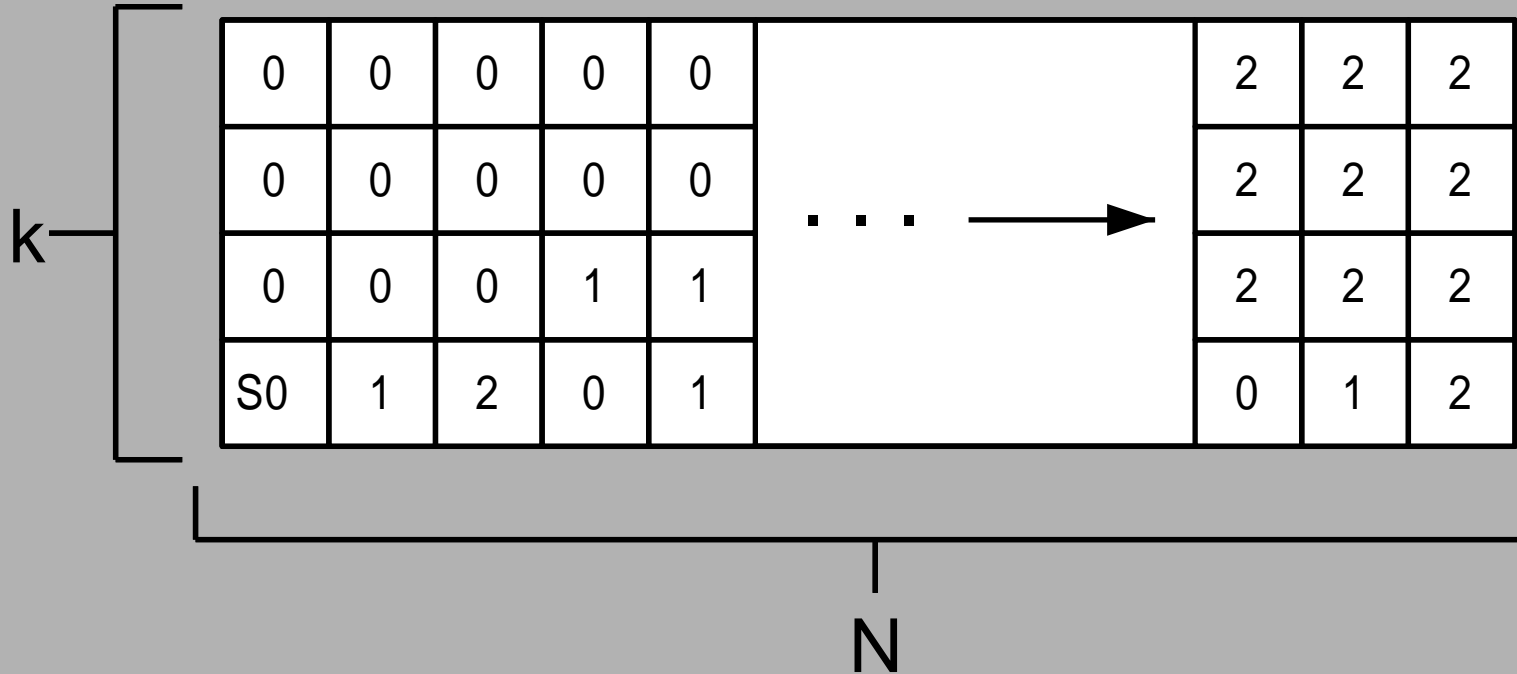
Building $k \times N$ Rectangles

k -digit, base $N^{(1/k)}$ counter:



Building $k \times N$ Rectangles

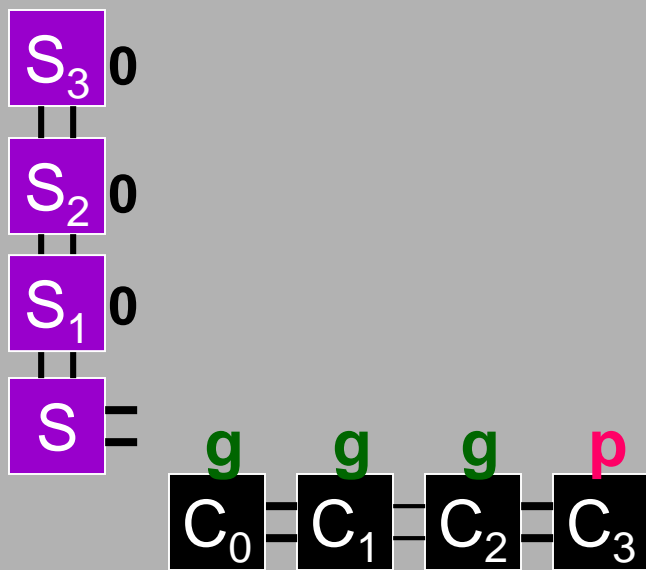
k -digit, base $N^{1/k}$ counter:



Tile Complexity: $O(k + N^{1/k})$

Build a 4 x 256 rectangle:

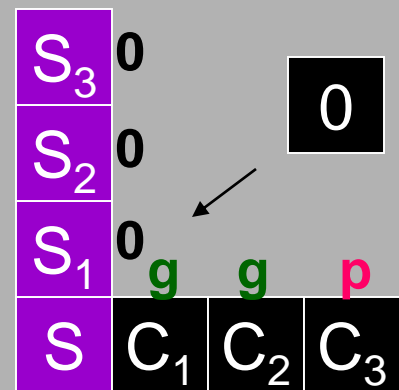
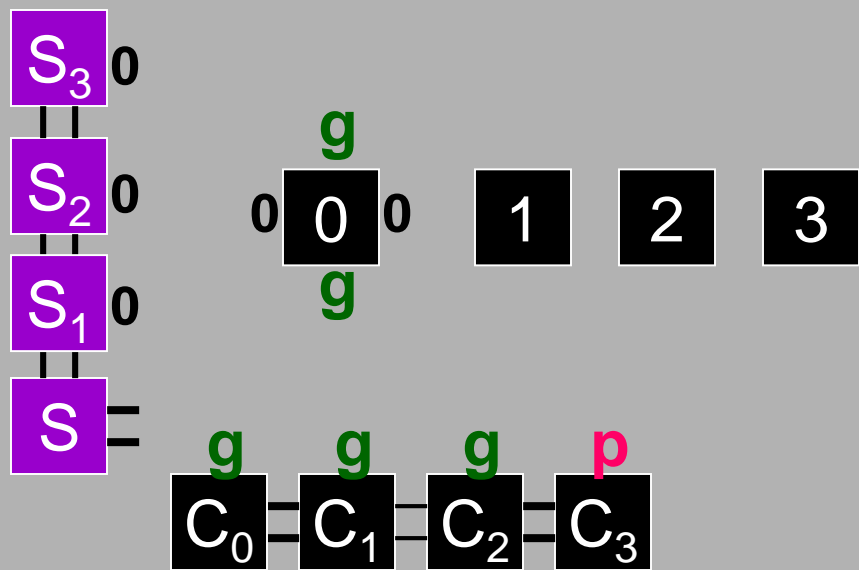
$t = 2$



S

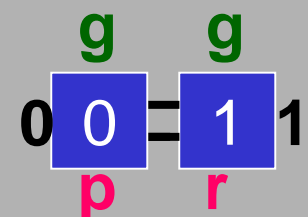
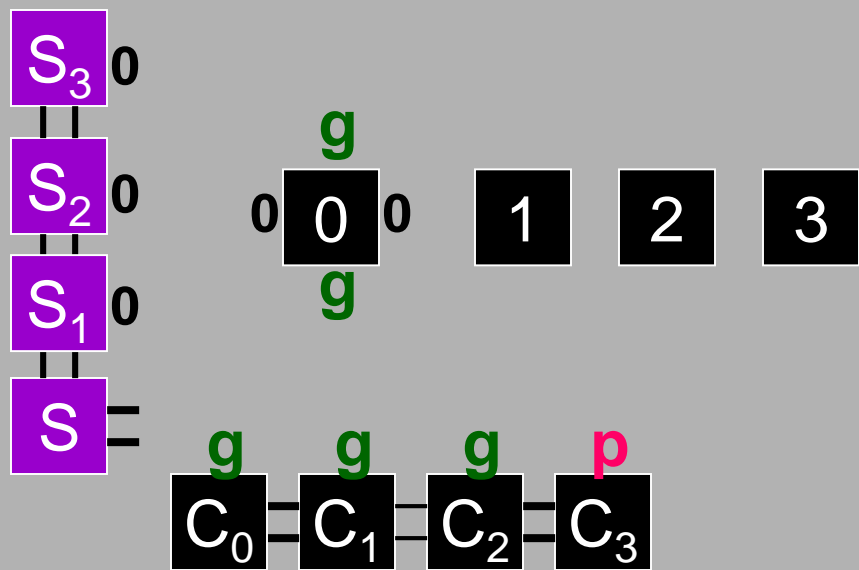
Build a 4 x 256 rectangle:

$t = 2$



Build a 4 x 256 rectangle:

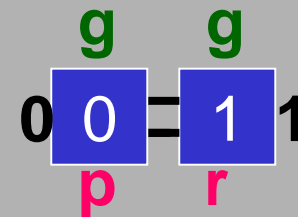
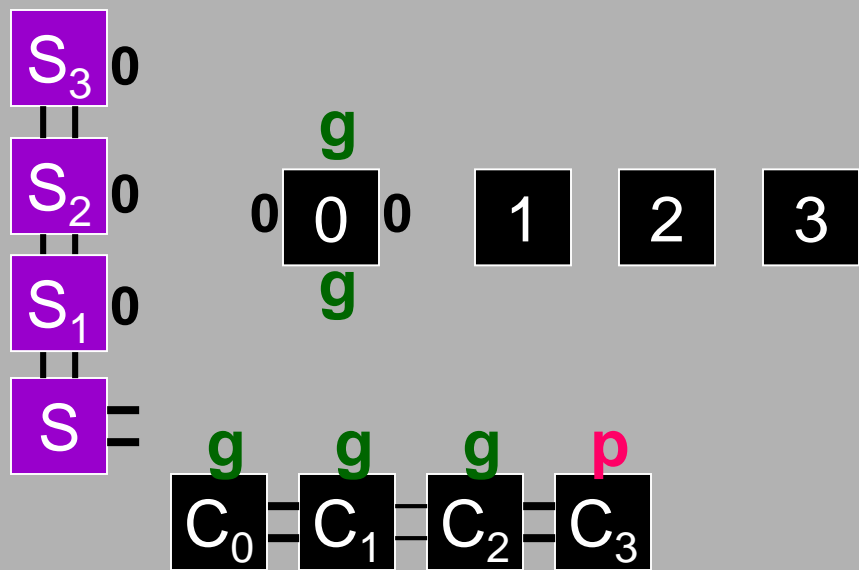
$t = 2$



S_3	0	0	
S_2	0	0	
S_1	0	0	
S	C_1	C_2	C_3

Build a 4 x 256 rectangle:

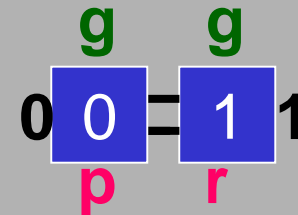
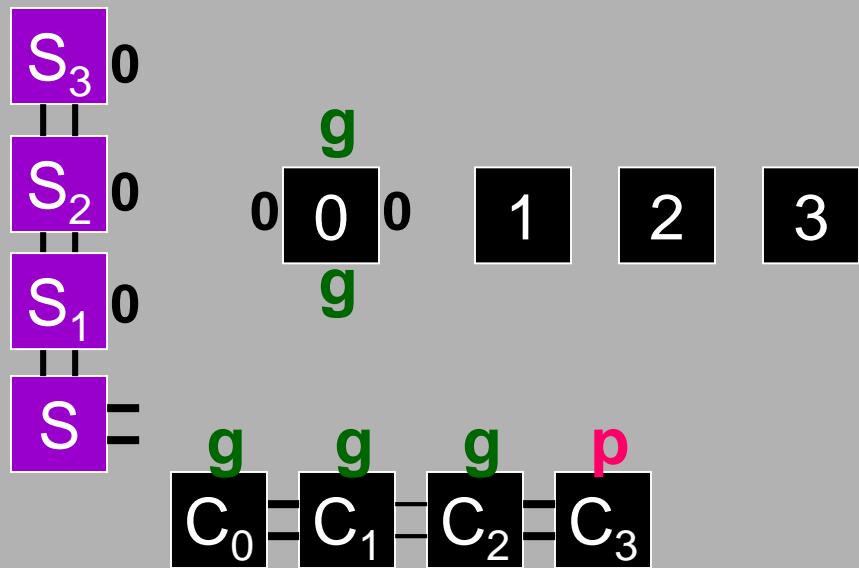
$t = 2$



S_3	0	0		
S_2	0	0		
S_1	0	0	0	1
S	C_1	C_2	C_3	

Build a 4 x 256 rectangle:

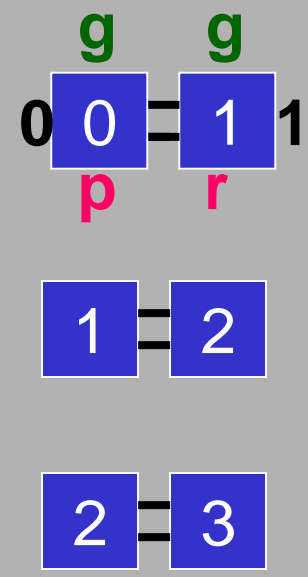
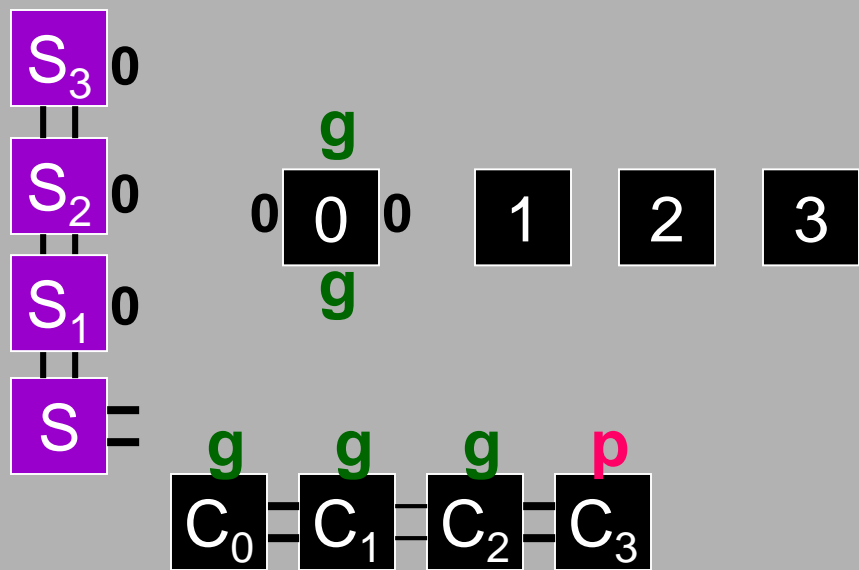
$t = 2$



S_3	0	0	0	0			
S_2	0	0	0	0			
S_1	0	0	0	1			
S	C_1	C_2	C_3	C_0	C_1	C_2	C_3

Build a 4 x 256 rectangle:

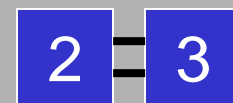
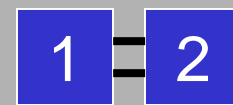
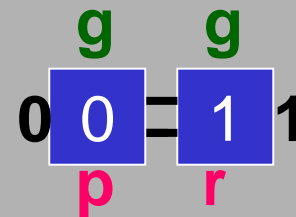
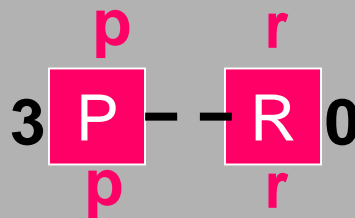
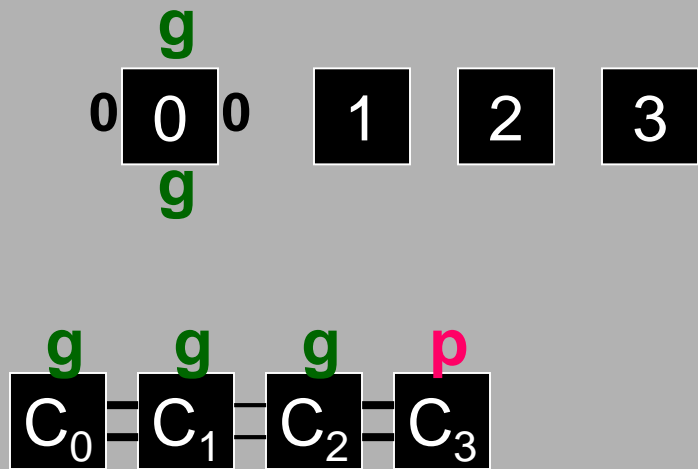
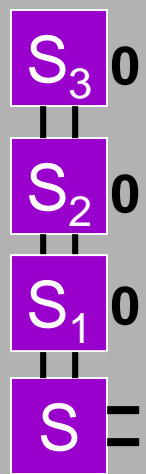
$t = 2$



S ₃	0	0	0	0	0	0	
S ₂	0	0	0	0	0	0	
S ₁	0	0	0	1	1	1	p
S	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃

Build a 4 x 256 rectangle:

t = 2

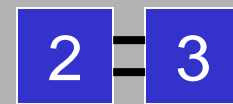
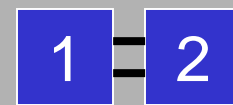
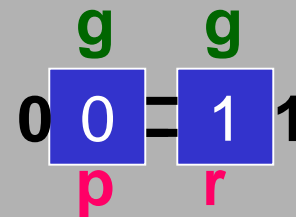
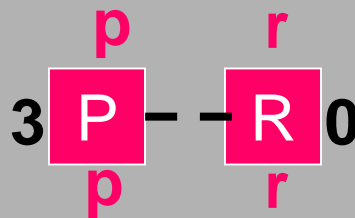
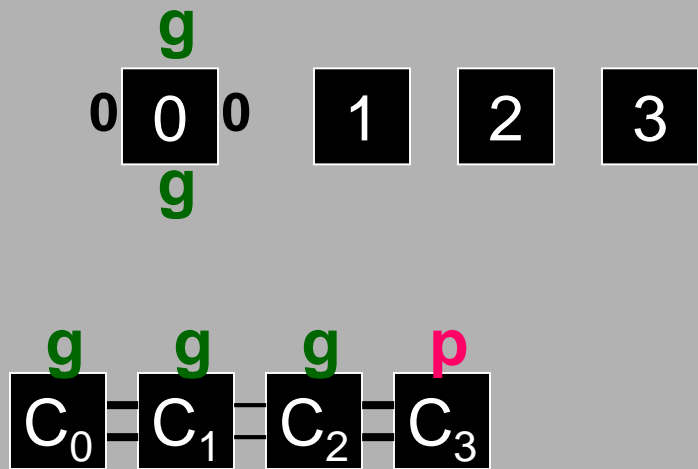
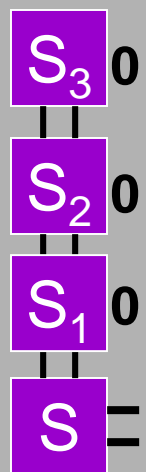


S ₃	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
S ₂	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
S ₁	0	0	0	1	1	1	1	2	2	2	2	3	3	3	
S	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃

p

Build a 4 x 256 rectangle:

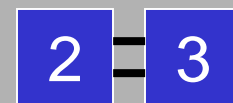
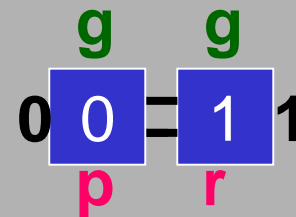
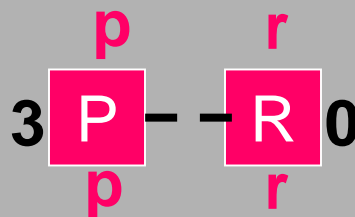
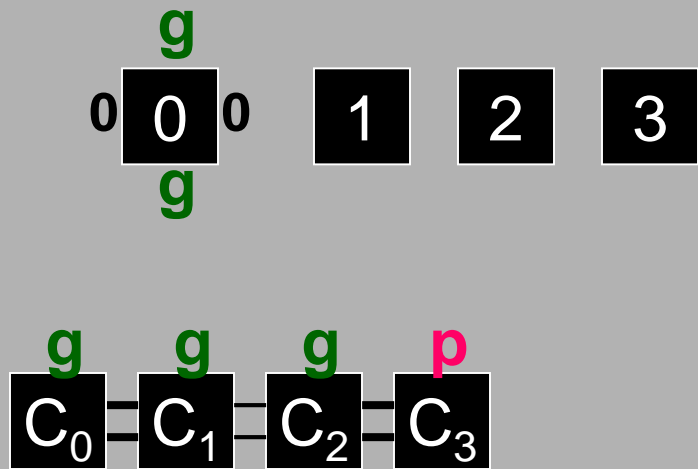
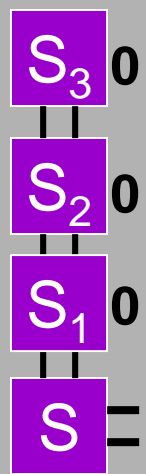
t = 2



S ₃	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S ₂	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S ₁	0	0	0	1	1	1	1	2	2	2	2	3	3	3	P
S	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃

Build a 4 x 256 rectangle:

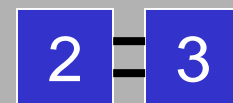
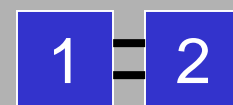
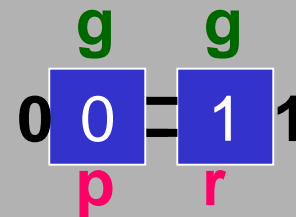
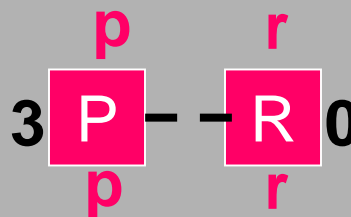
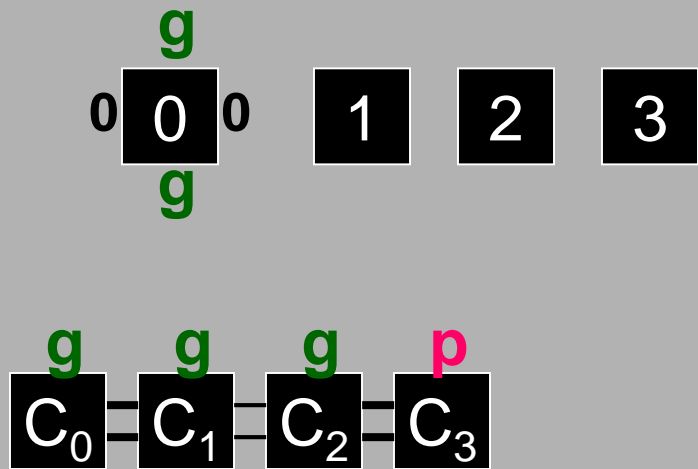
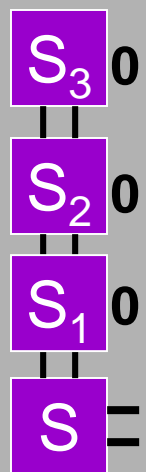
t = 2



S ₃	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
S ₂	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
S ₁	0	0	0	1	1	1	1	2	2	2	2	3	3	3	P	
S	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	

Build a 4 x 256 rectangle:

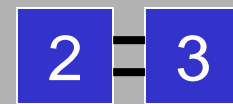
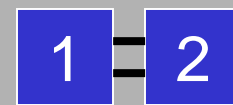
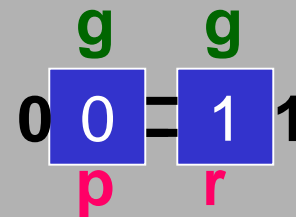
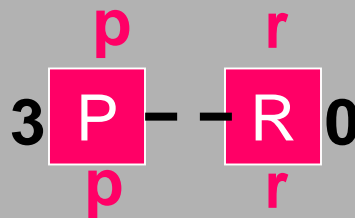
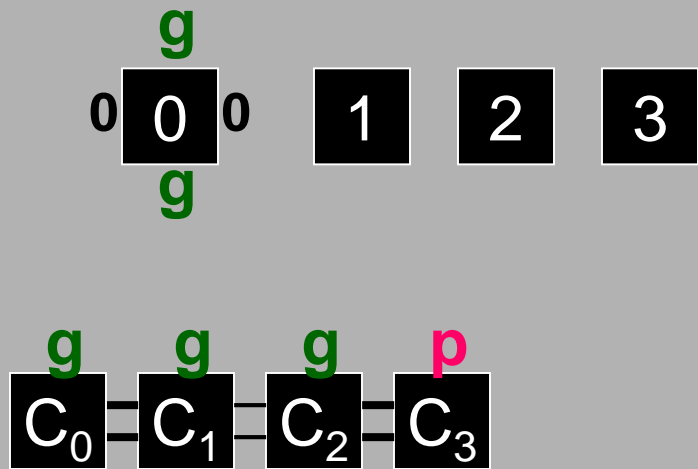
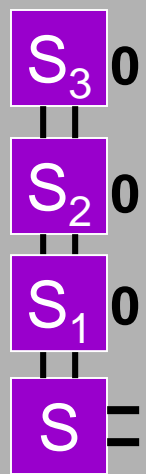
t = 2



S ₃	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S ₂	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
S ₁	0	0	0	1	1	1	1	2	2	2	2	3	3	3	P
S	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃

Build a 4 x 256 rectangle:

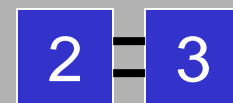
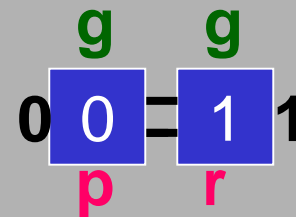
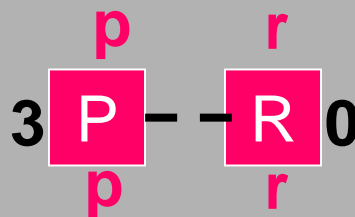
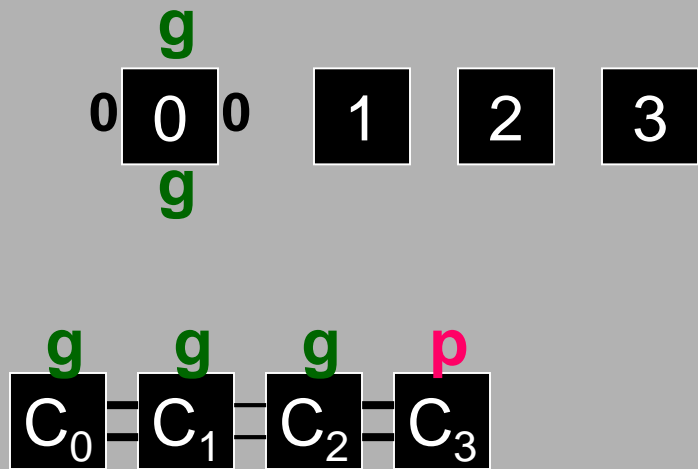
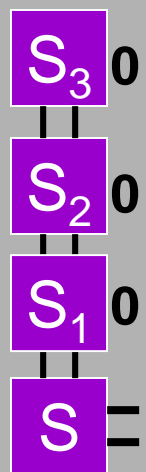
t = 2



S ₃	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
S ₂	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
S ₁	0	0	0	1	1	1	1	2	2	2	2	3	3	3	P	R			
S	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	...

Build a 4 x 256 rectangle:

t = 2

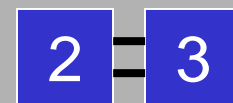
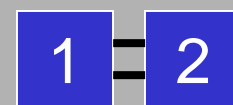
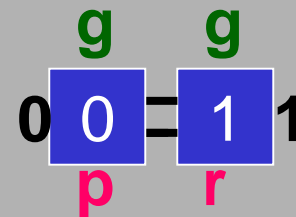
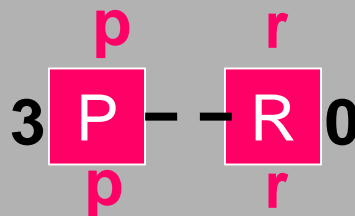
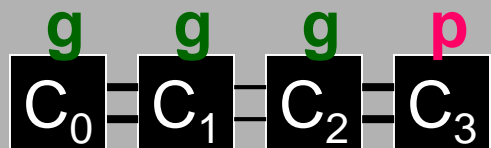
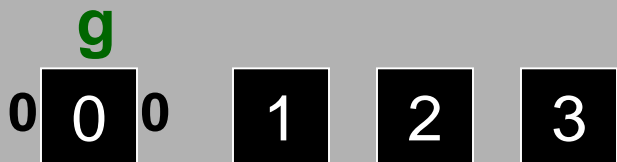
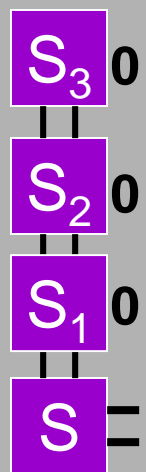


S ₃	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S ₂	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
S ₁	0	0	0	1	1	1	1	2	2	2	2	3	3	3	P	R	0	0
S	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂

...

Build a 4 x 256 rectangle:

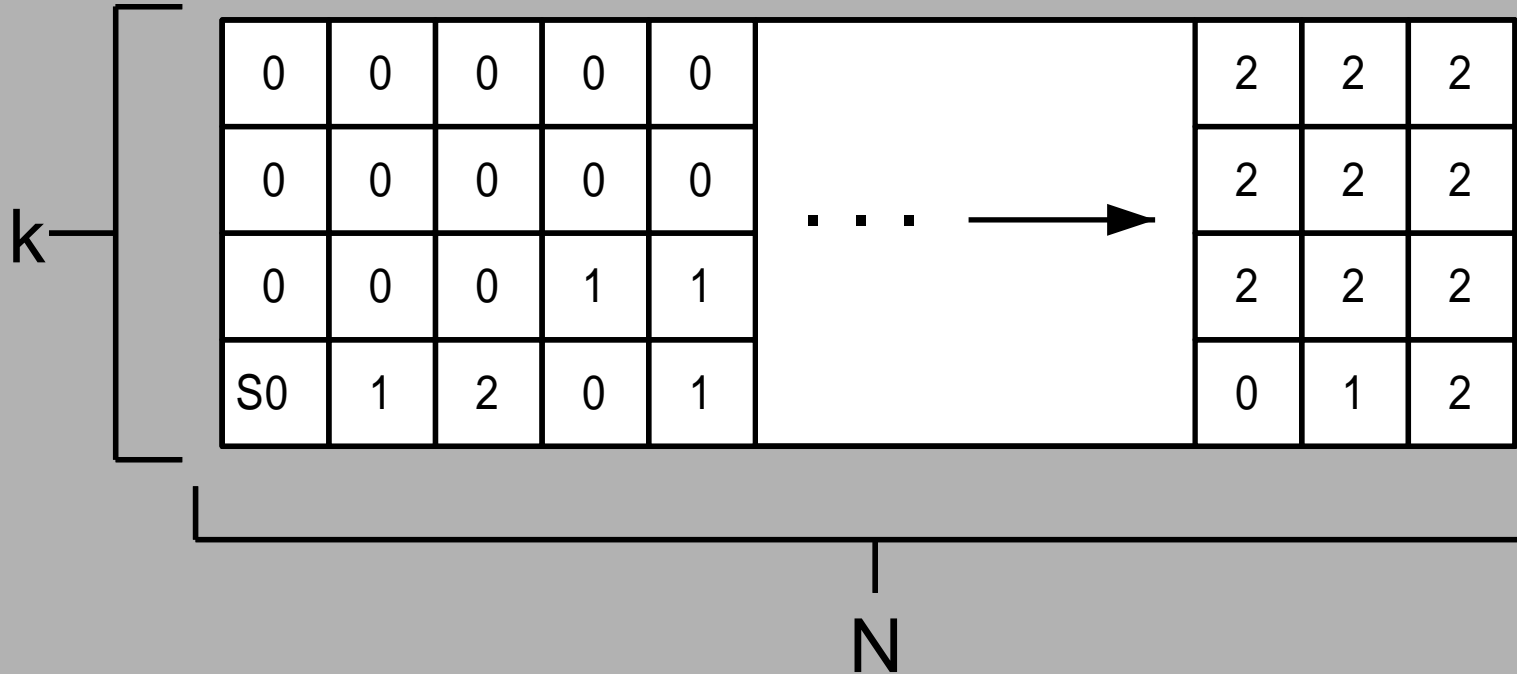
t = 2



3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	P
2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	P
3	3	P	R	0	0	0	1	1	1	1	2	2	2	2	3	3	3	3	P
C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	C ₀	C ₁	C ₂	C ₃	

Building $k \times N$ Rectangles

k -digit, base $N^{1/k}$ counter:



Tile Complexity: $O(k + N^{1/k})$

Lower bound: ?