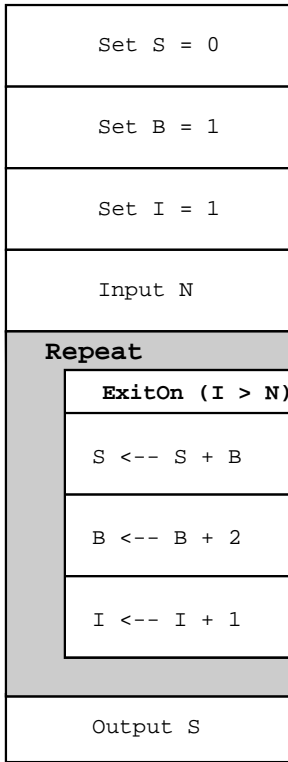


# SQUARE: Trace and Loop Invariance

## 1 ODD-SQUARE



### Trace of ODD-SQUARE (note 2D)

which computes the square S of any integer N by summing the first N odd integers

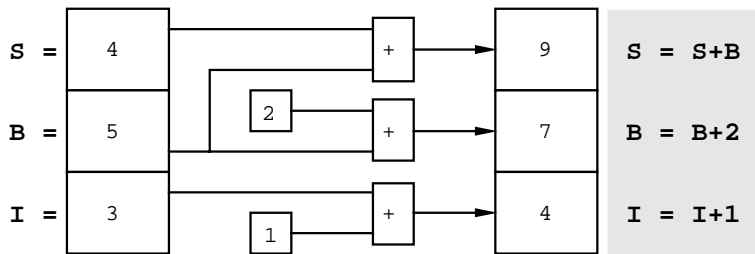
$$(6^2 = 1 + 3 + 5 + 7 + 9 + 11 = 36)$$

N =	6								
		1 > 6?	2 > 6?	3 > 6?	4 > 6?	5 > 6?	6 > 6?	7 > 6?	
		F	F	F	F	F	F	T	
S =	0	1	4	9	16	25	36		
B =	1	3	5	7	9	11	13		
I =	1	2	3	4	5	6	7		
									Output 36

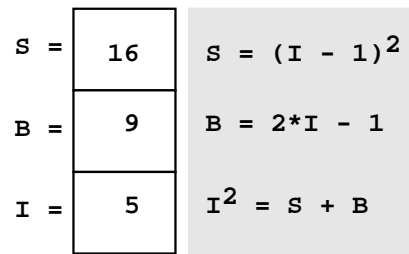
between any two steps

at every stage

## 2 HORIZONTAL VIEW



## 3 VERTICAL VIEW



## 4

S =	0	1	4	9	16	25	36
B =	1	3	5	7	9	11	13
I =	1	2	3	4	5	6	7

## 5

S =	0	1	4	9	16	25	36
B =	1	3	5	7	9	11	13
I =	1	2	3	4	5	6	7