Workshop One
Simple Arrays, Flowcharts and Playing Computer

SCC 120 Introduction to Data Structures

Q1: -14

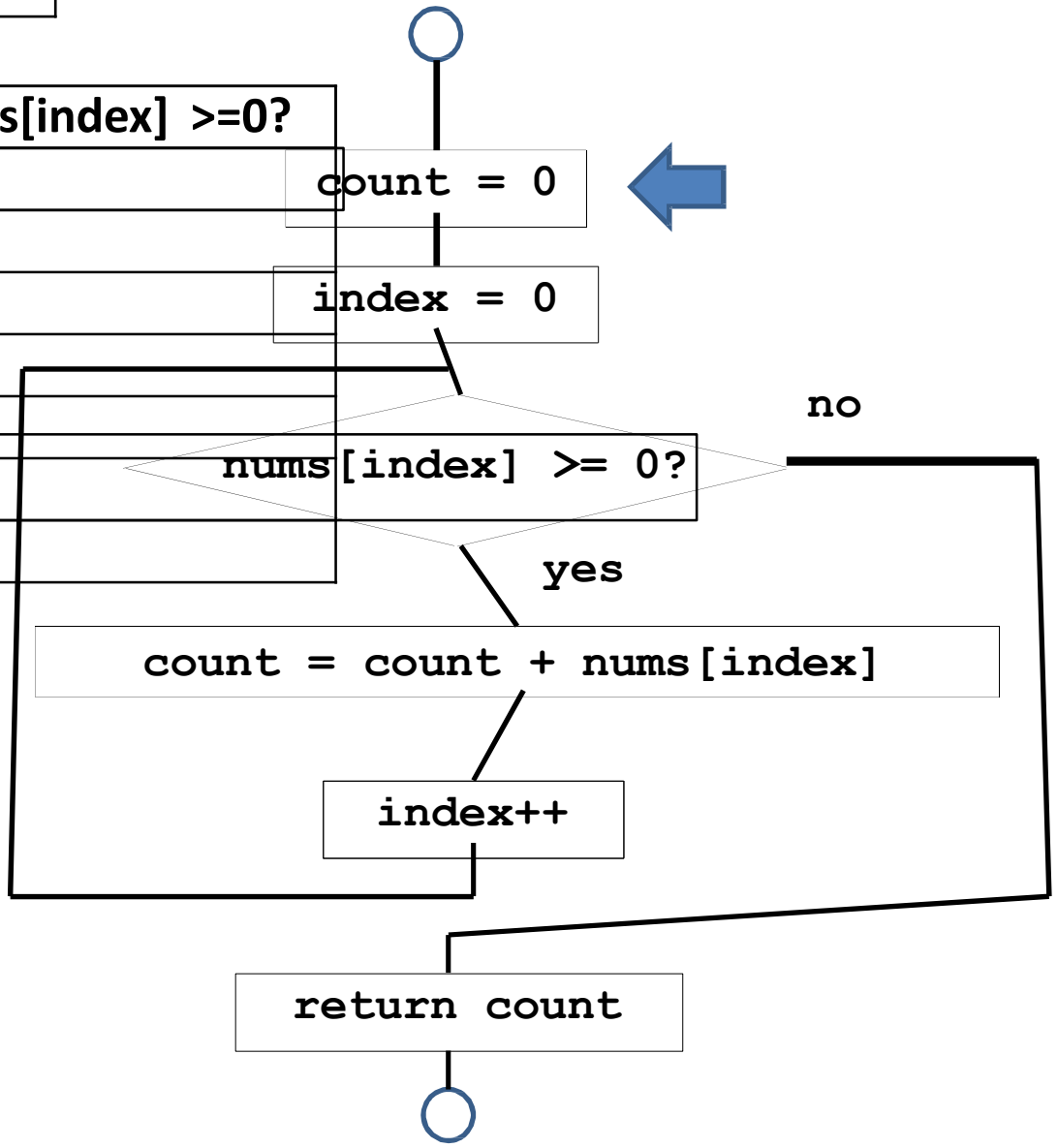
Q2: 11101100

Q3

EXERCISE ONE. WORKED EXAMPLE OF PLAYING COMPUTER

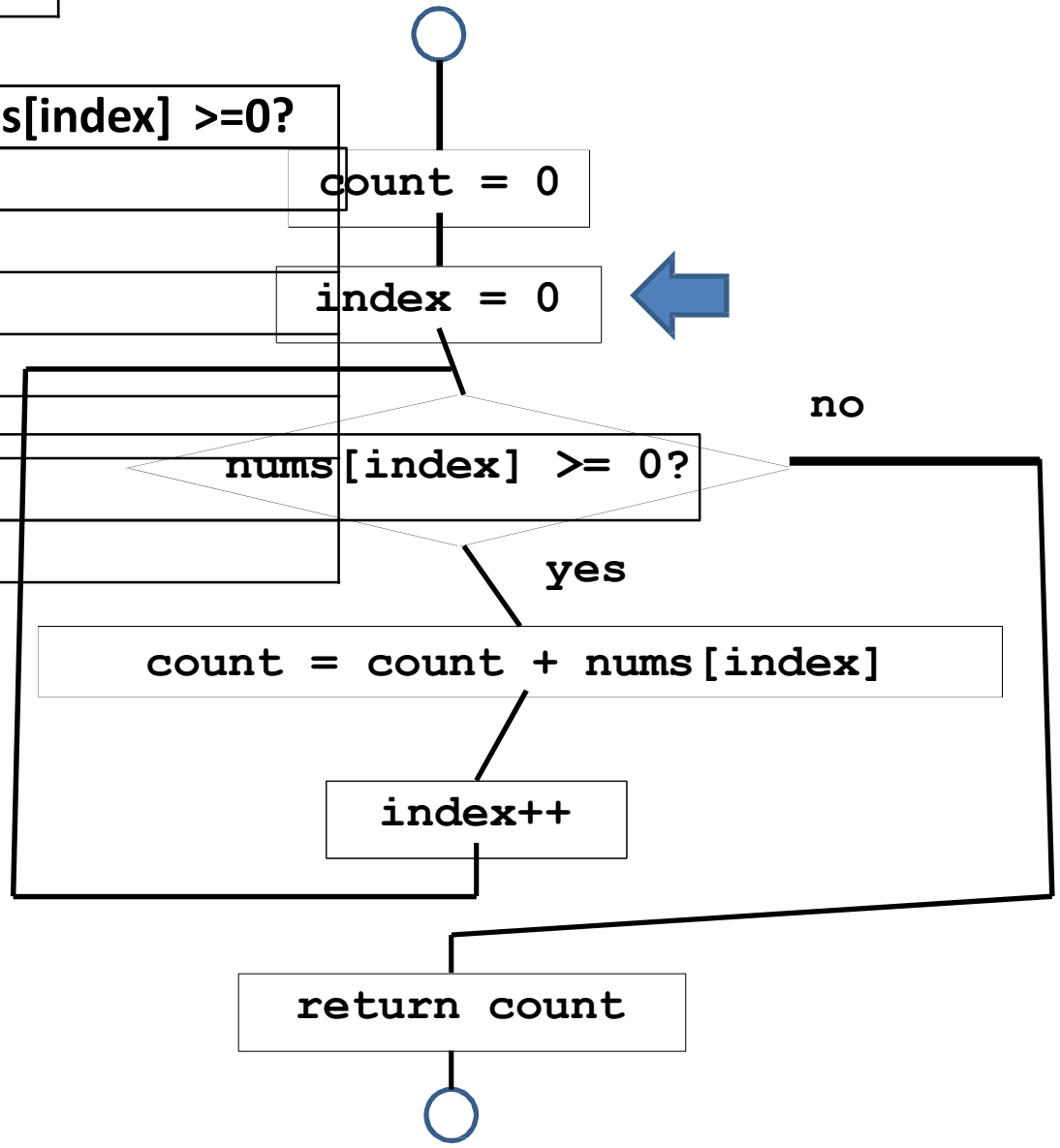
	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

count	index	nums[index]	nums[index] >=0?
0			



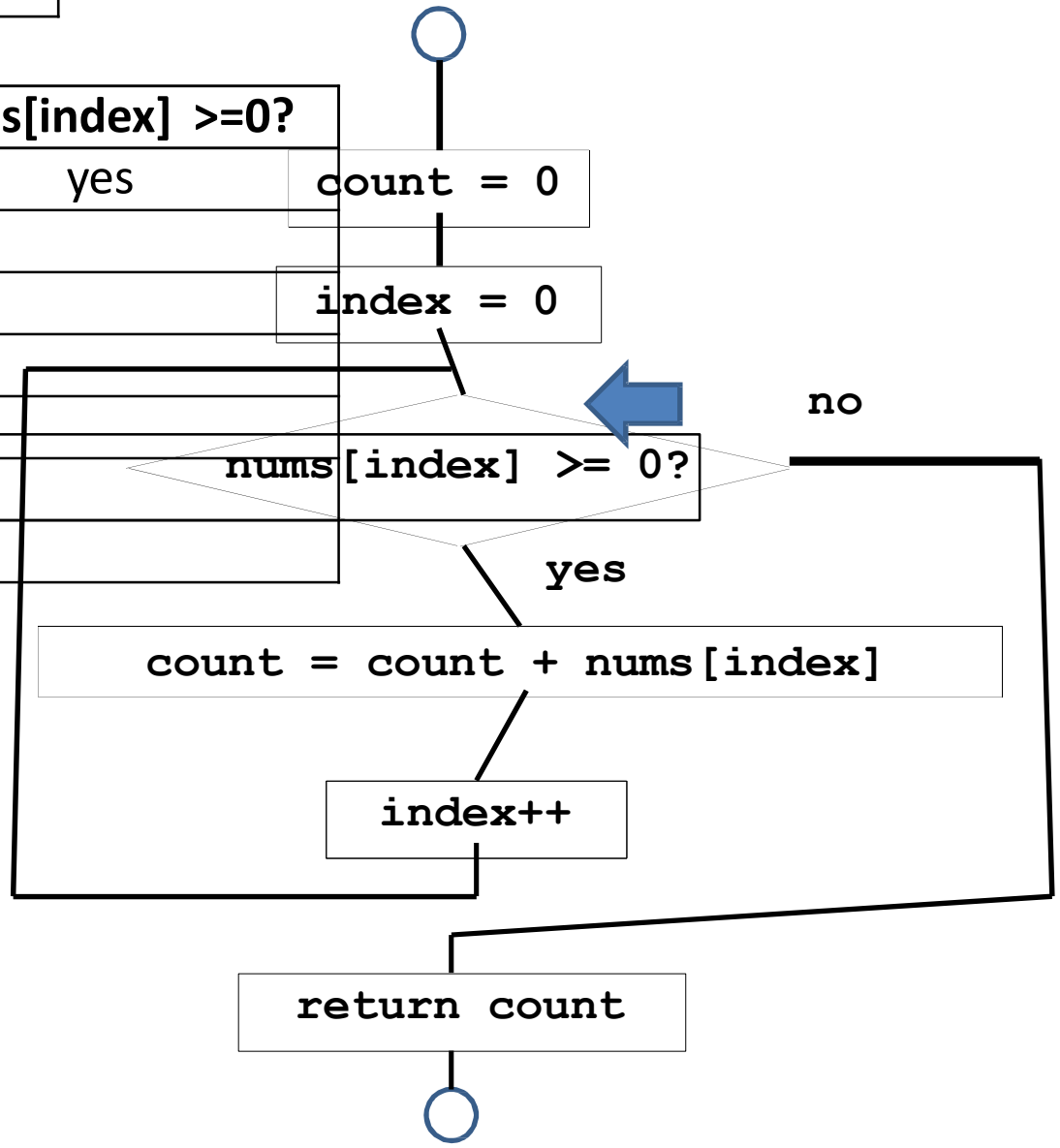
	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

count	index	nums[index]	nums[index] >=0?
0	0		



	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

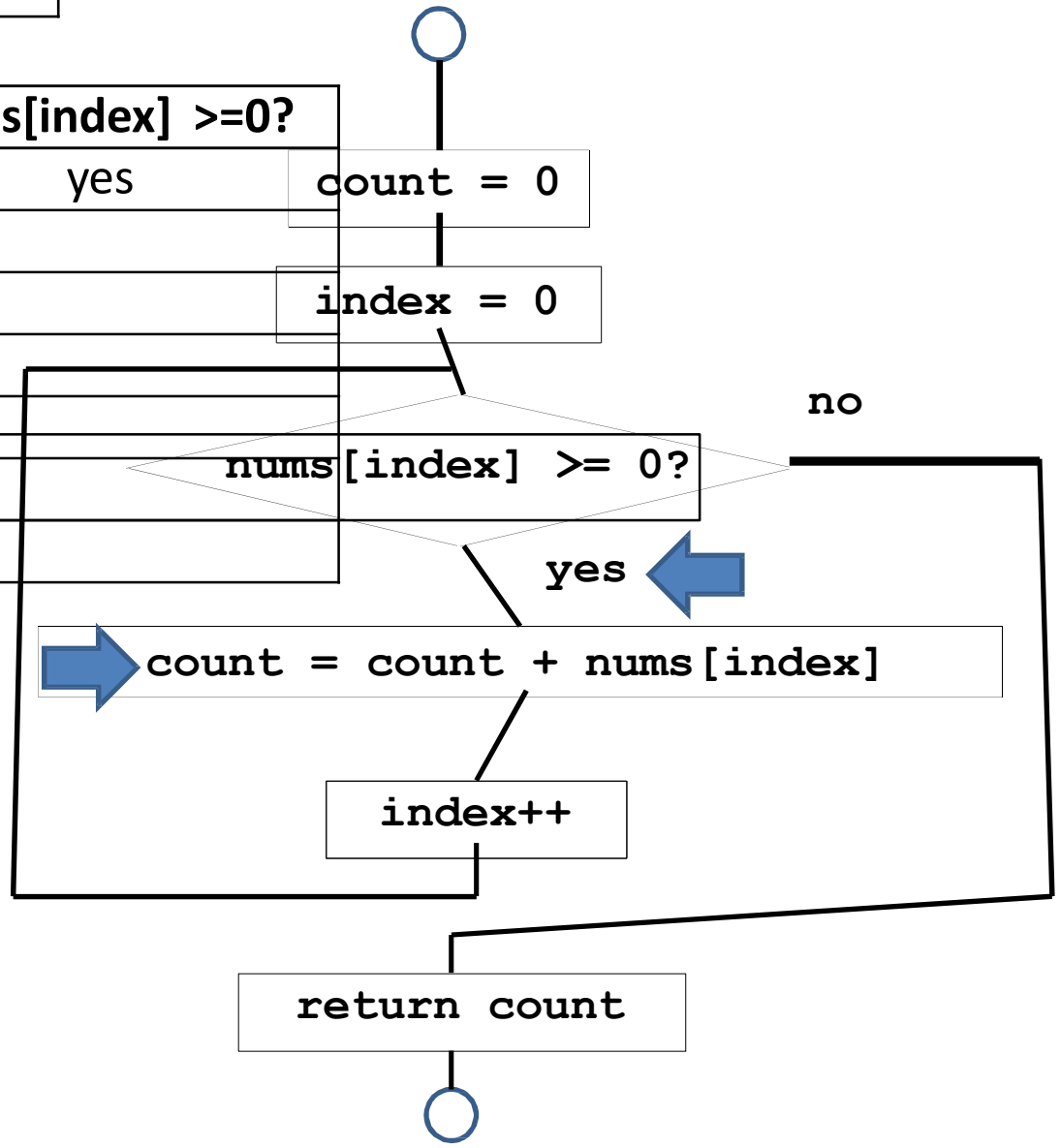
count	index	nums[index]	nums[index] >=0?
0	0	14	yes



nums[index] >= 0?
index = 0
nums[0] = 14
14 >= 0? yes

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

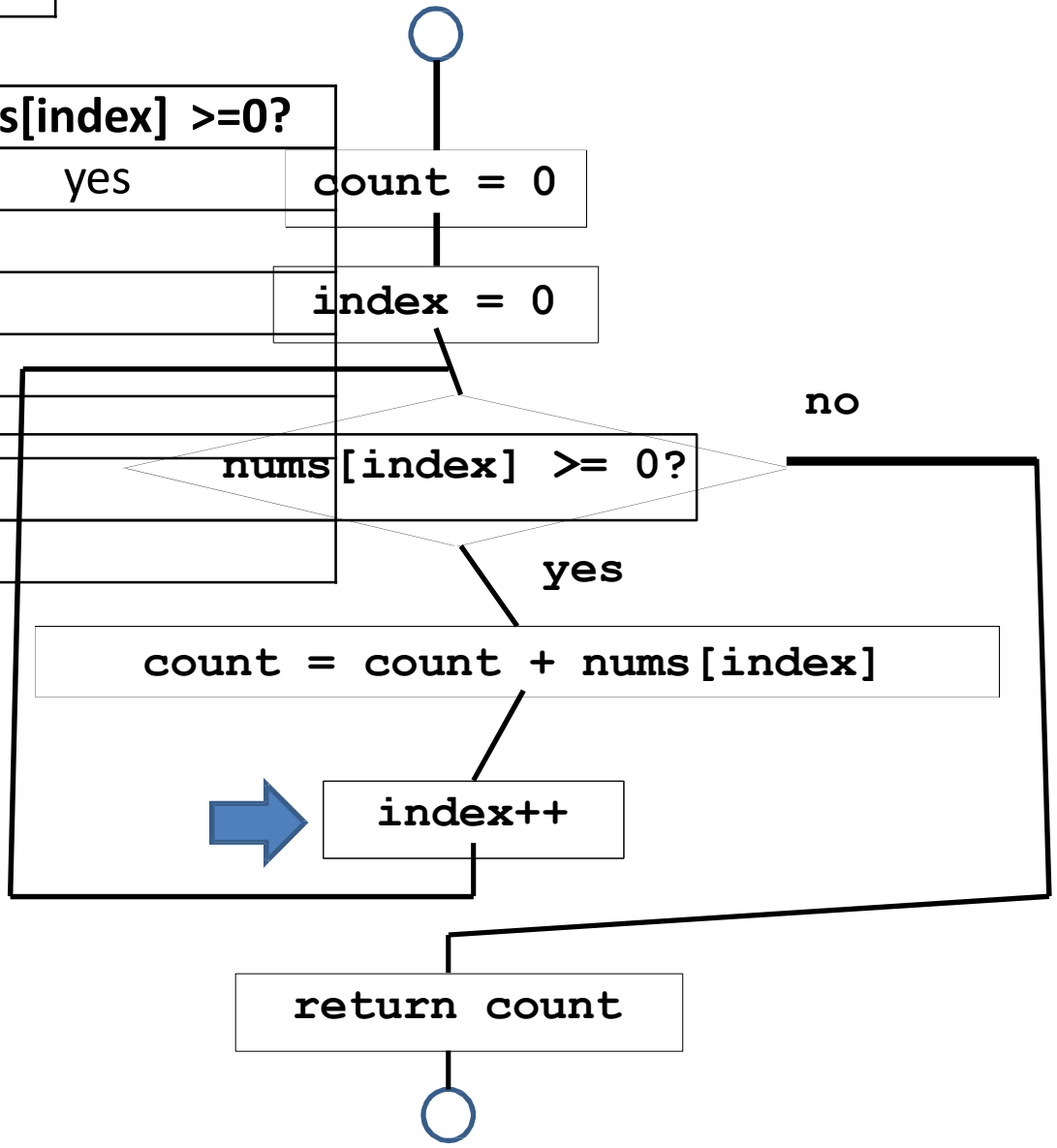
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14			



count = count + nums[index]
= 0 + nums[0]
= 0 + 14
= 14

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

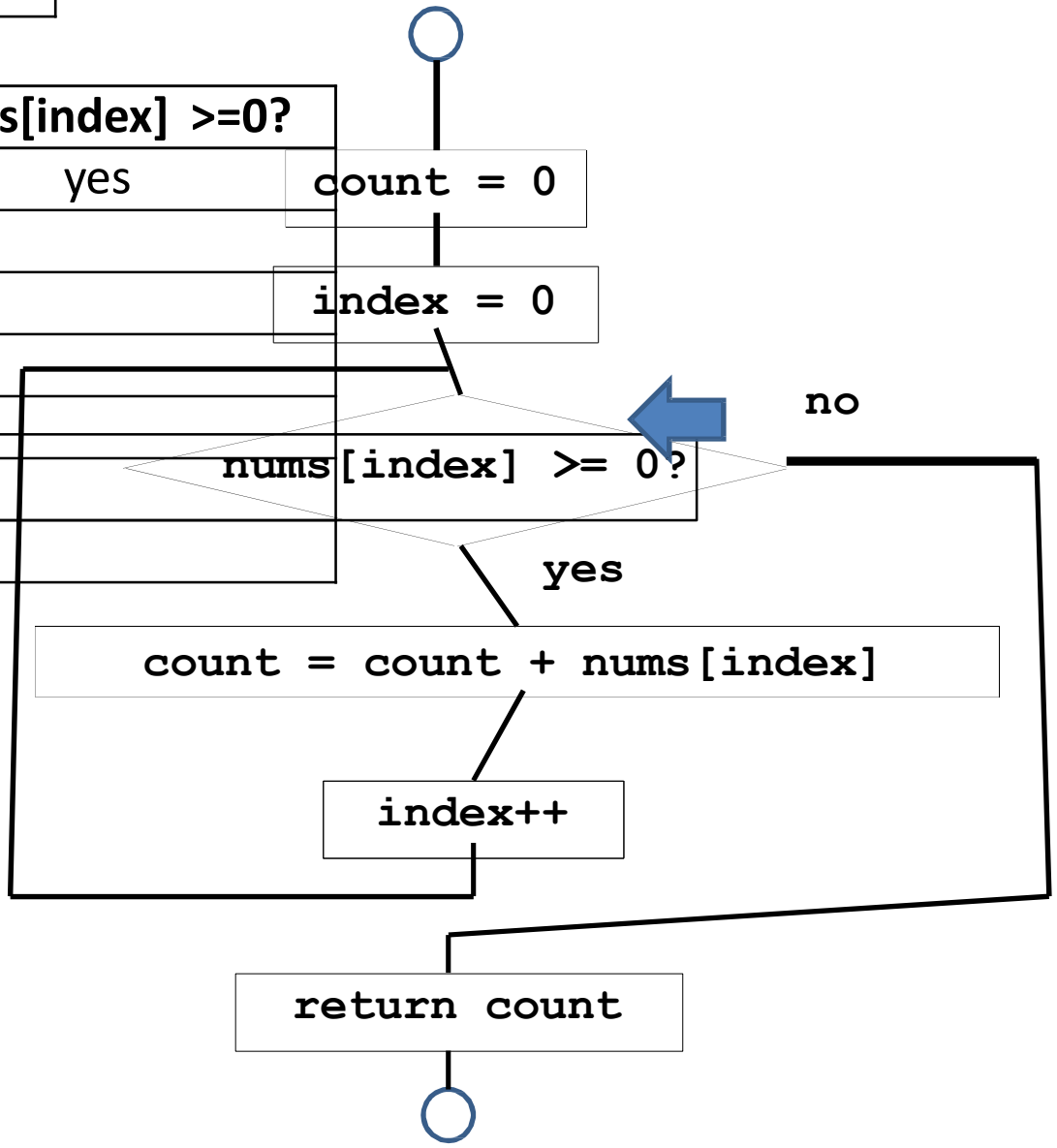
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1		



index = index + 1
= 0 + 1
= 1

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

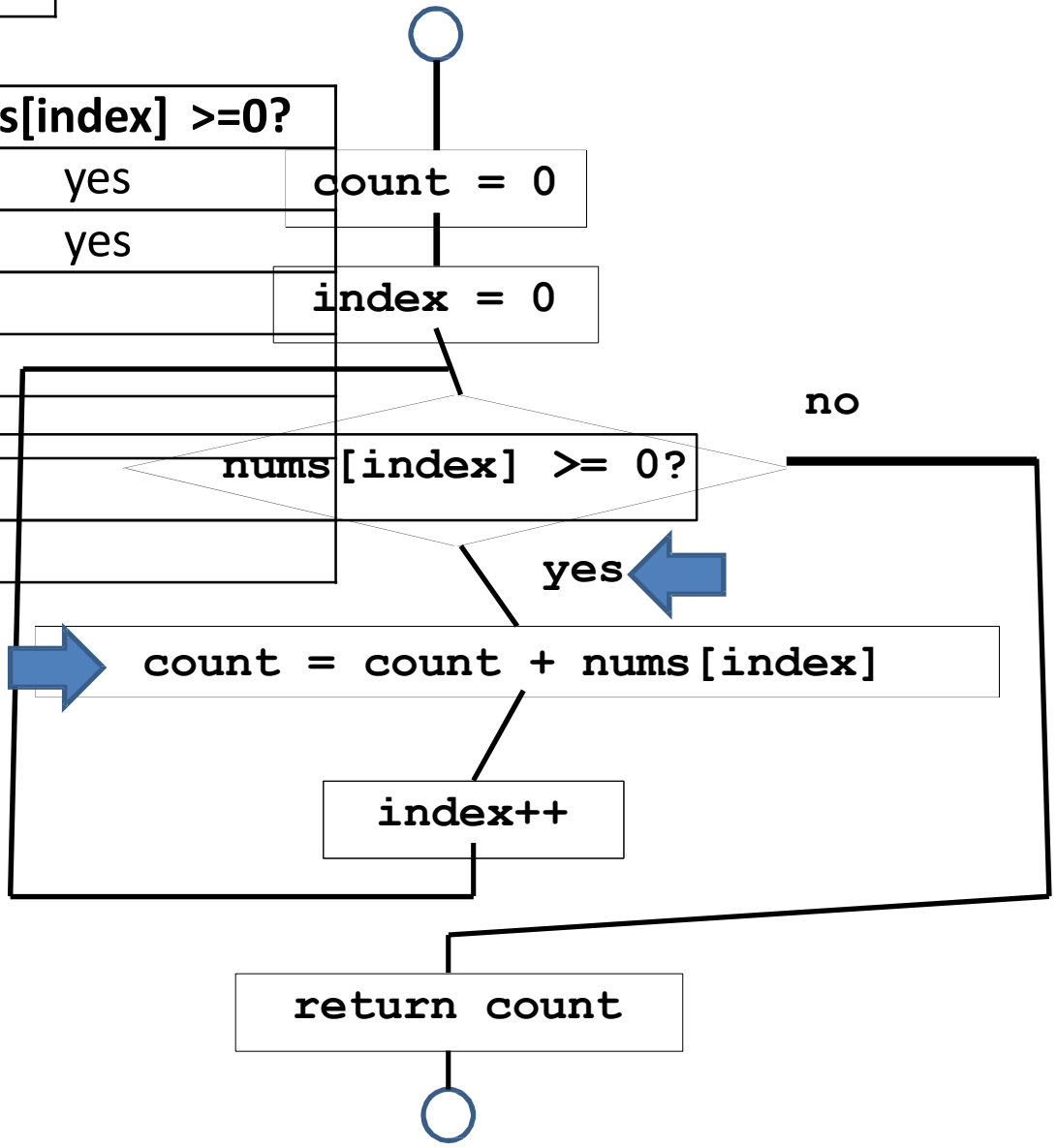
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	



nums[index] >= 0?
index = 1
nums[1] = 21
21>= 0? yes

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

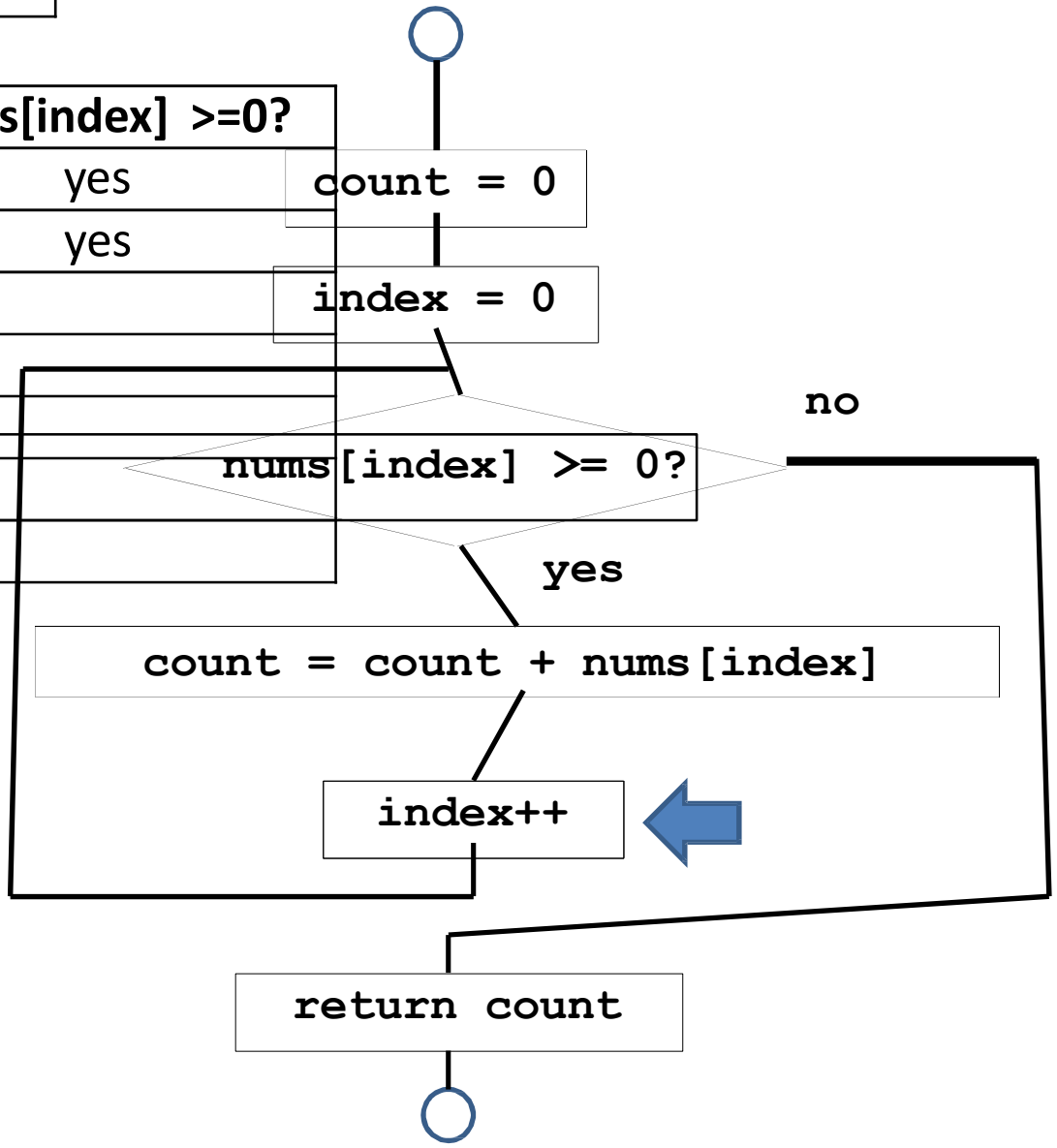
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	yes
35			



count = count + nums[index]
= 14 + nums[1]
= 14 + 21
= 35

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

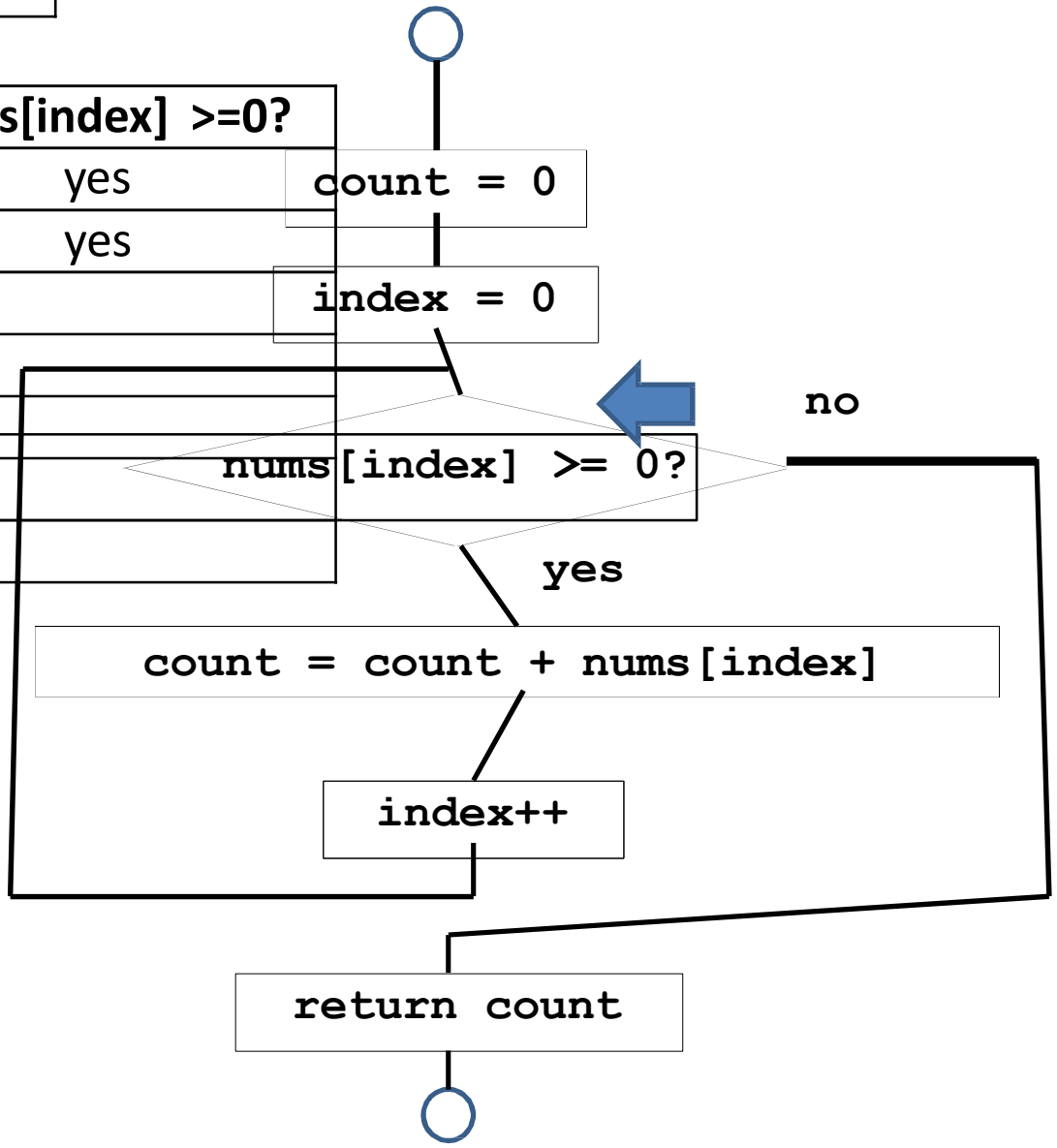
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	yes
35	2		



index = index + 1
= 1 + 1
= 2

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

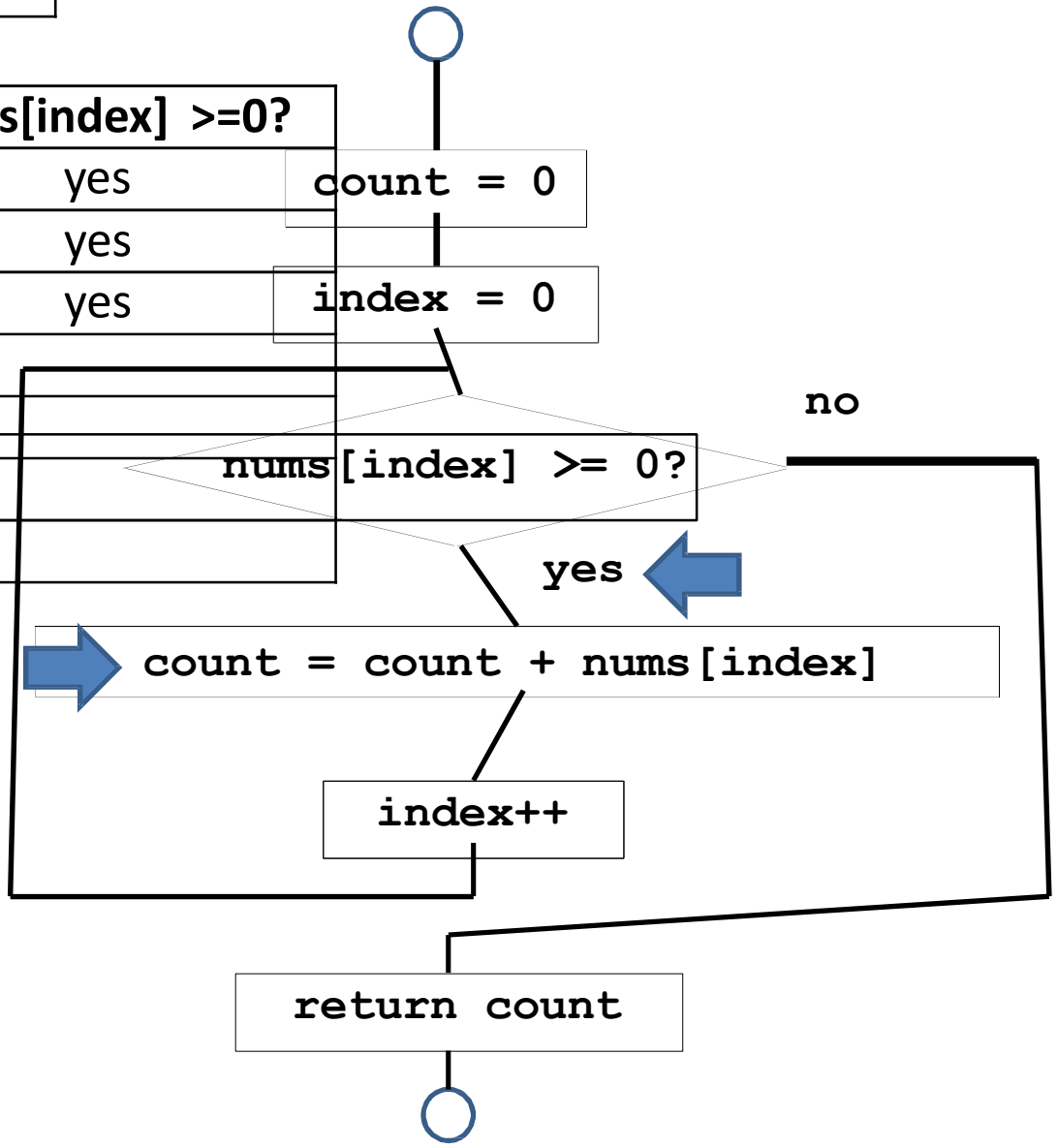
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	yes
35	2	3	



nums[index] >= 0?
index = 2
nums[2] = 3
3>= 0? yes

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

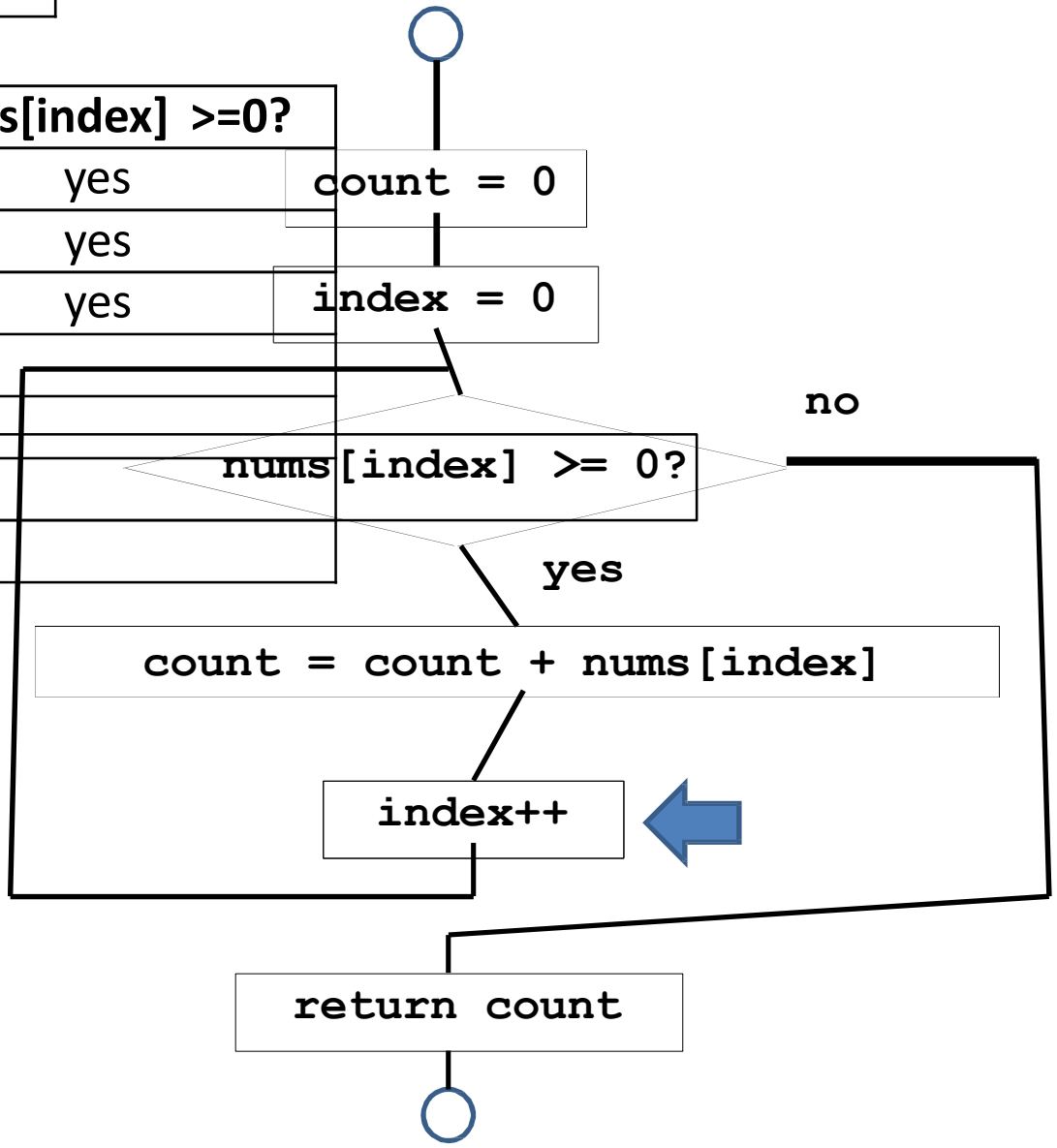
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	yes
35	2	3	yes
38			



count = count + nums[index]
= 35+ nums[2]
= 35+ 3
= 38

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

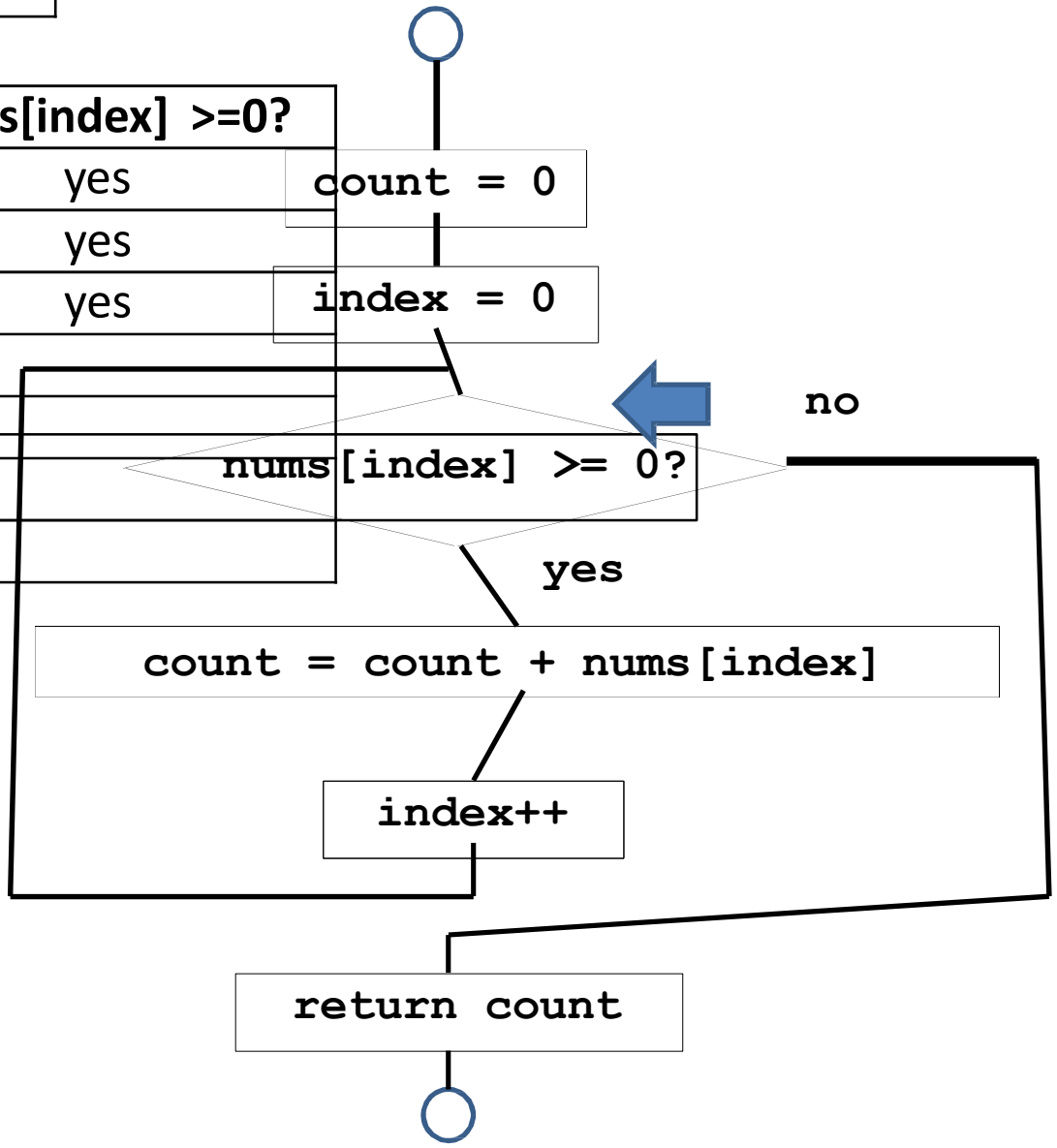
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	yes
35	2	3	yes
38	3		



index = index + 1
= 2 + 1
= 3

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

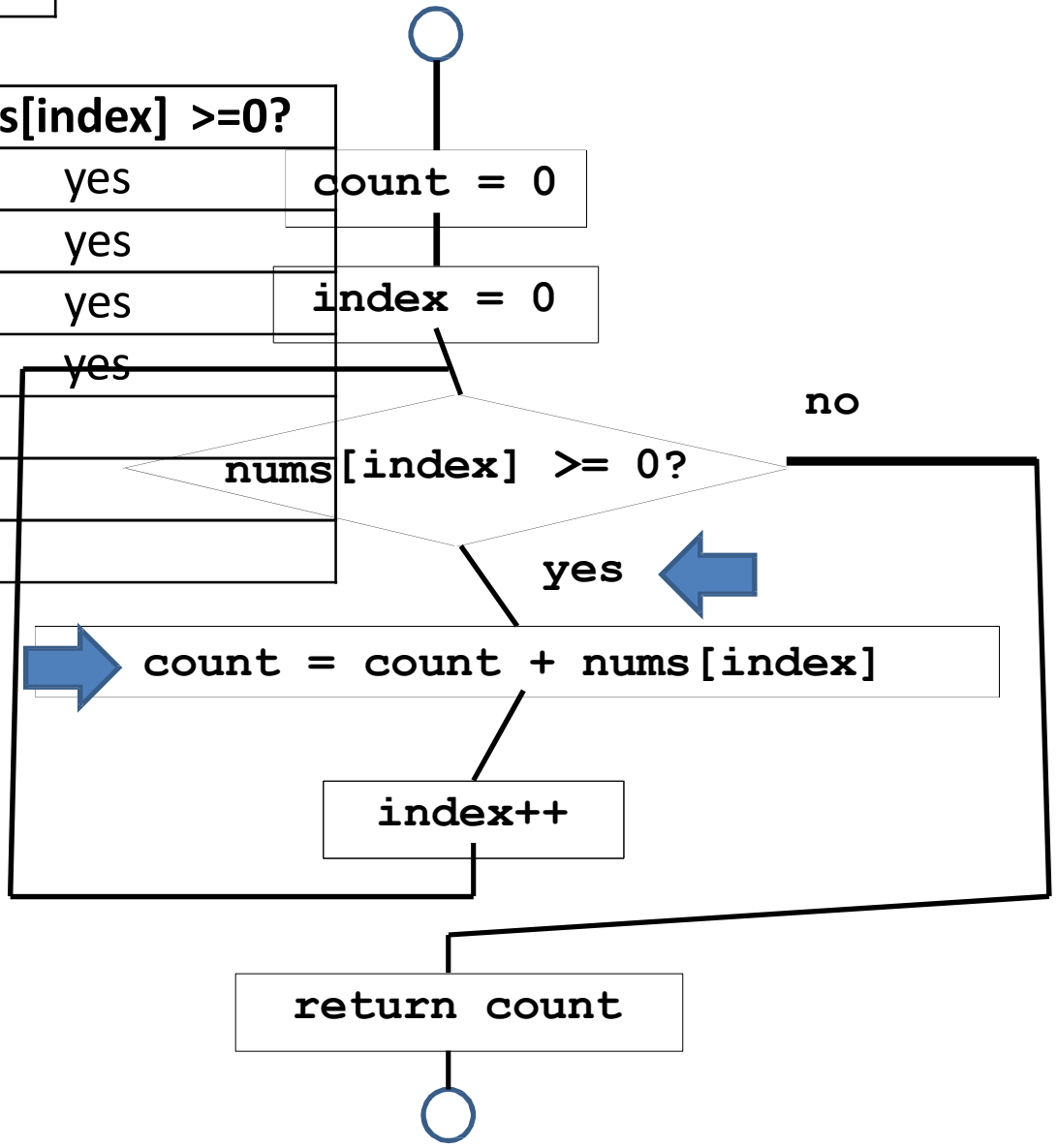
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	yes
35	2	3	yes
38	3	10	



nums[index] >= 0?
index = 3
nums[3] = 10
10 >= 0? yes

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

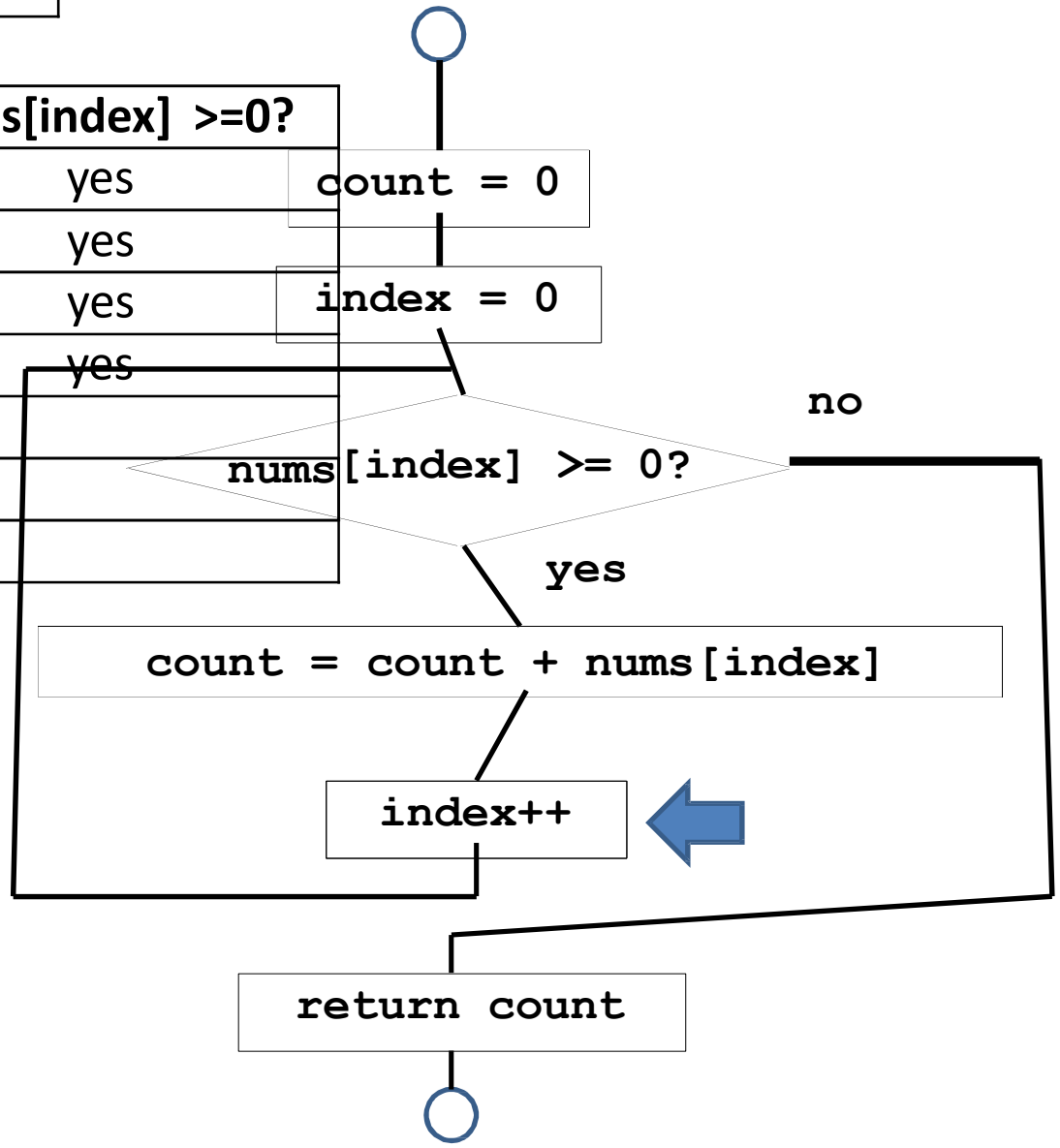
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	yes
35	2	3	yes
38	3	10	yes
48			



count = count + nums[index]
= 38+ nums[3]
= 38+ 10
= 48

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

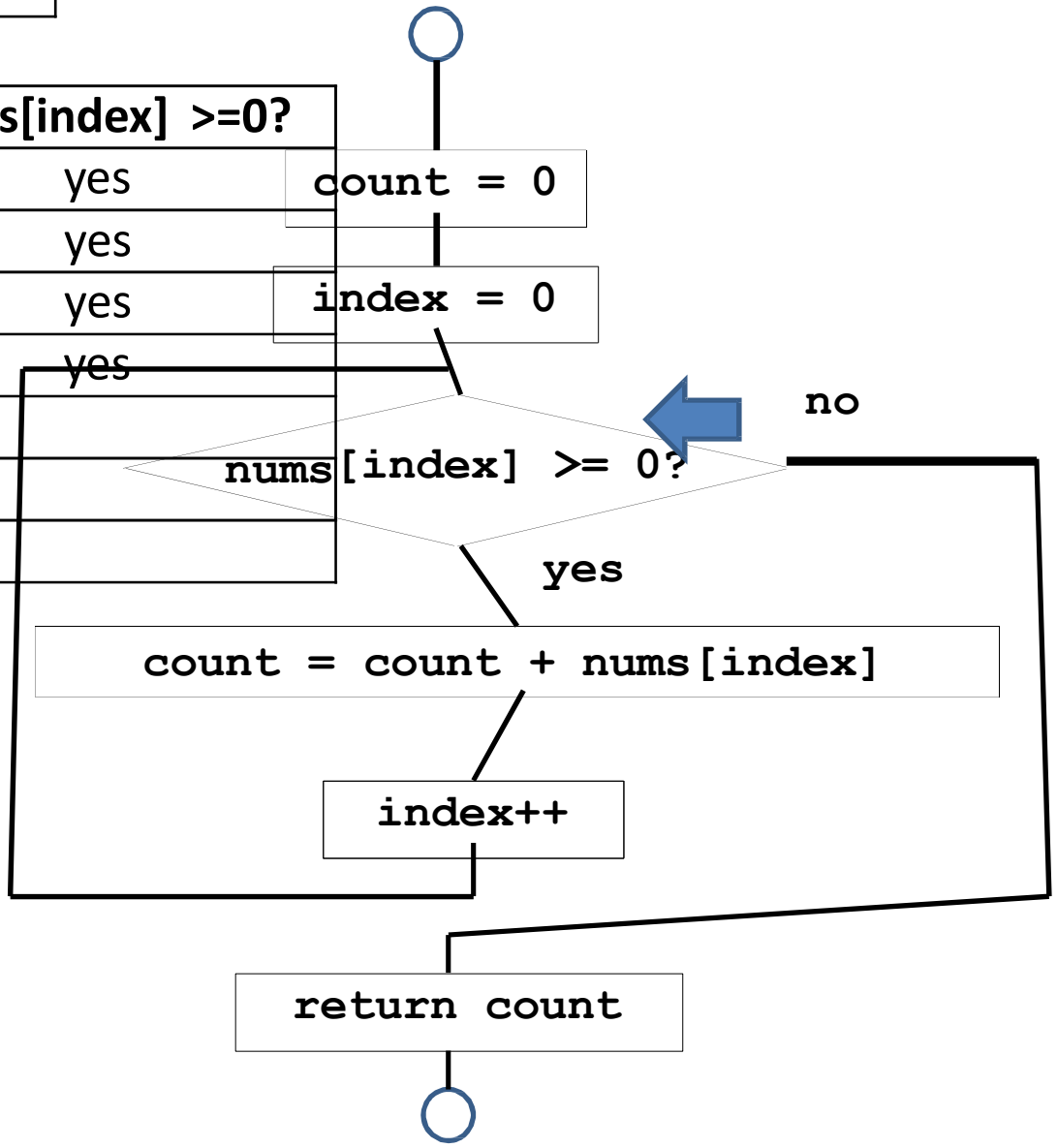
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	yes
35	2	3	yes
38	3	10	yes
48	4		



index = index + 1
= 3 + 1
= 4

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	yes
35	2	3	yes
38	3	10	yes
48	4	8	



nums[index] >= 0?

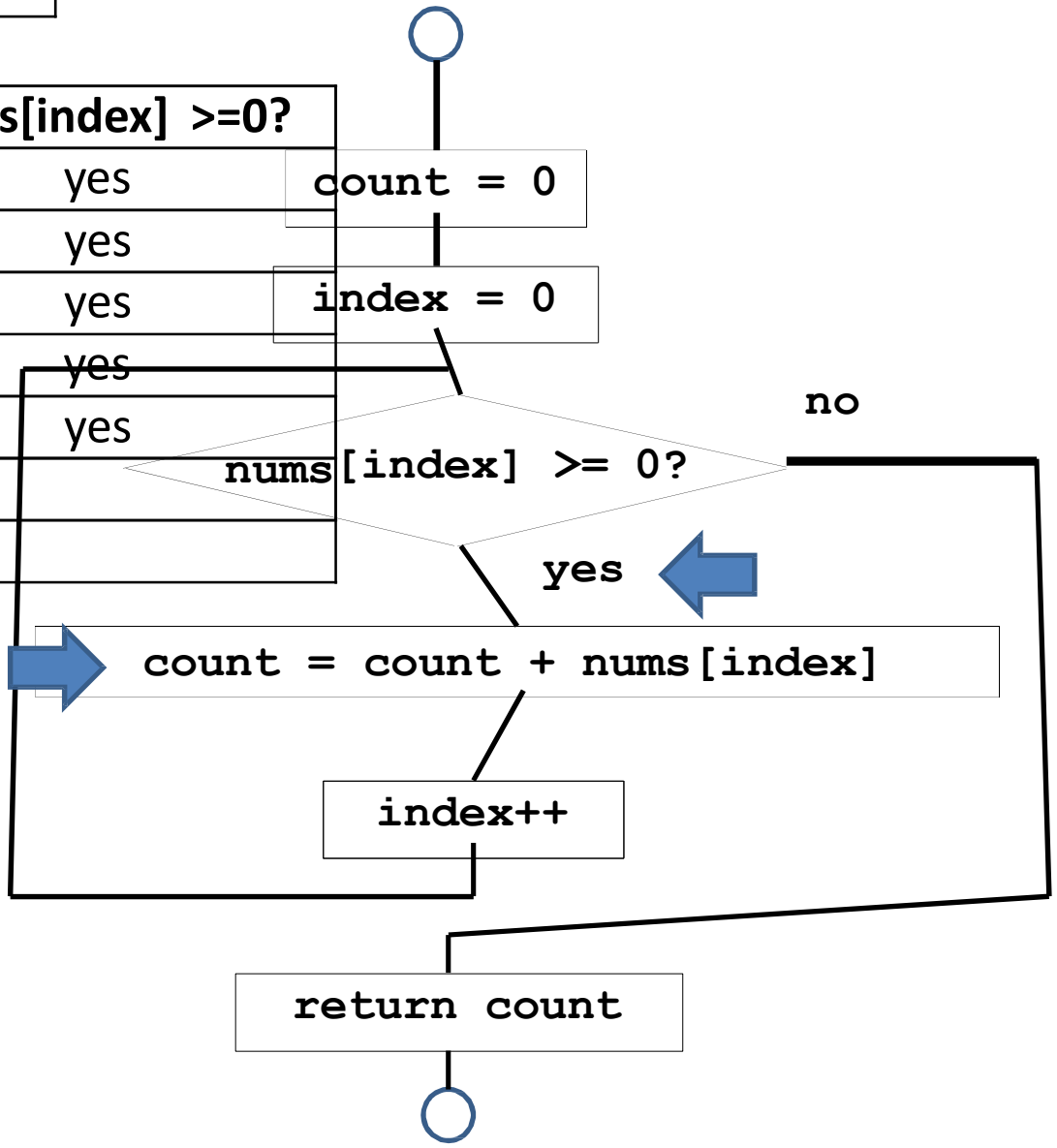
index = 4

nums[4] = 8

8 >= 0? yes

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

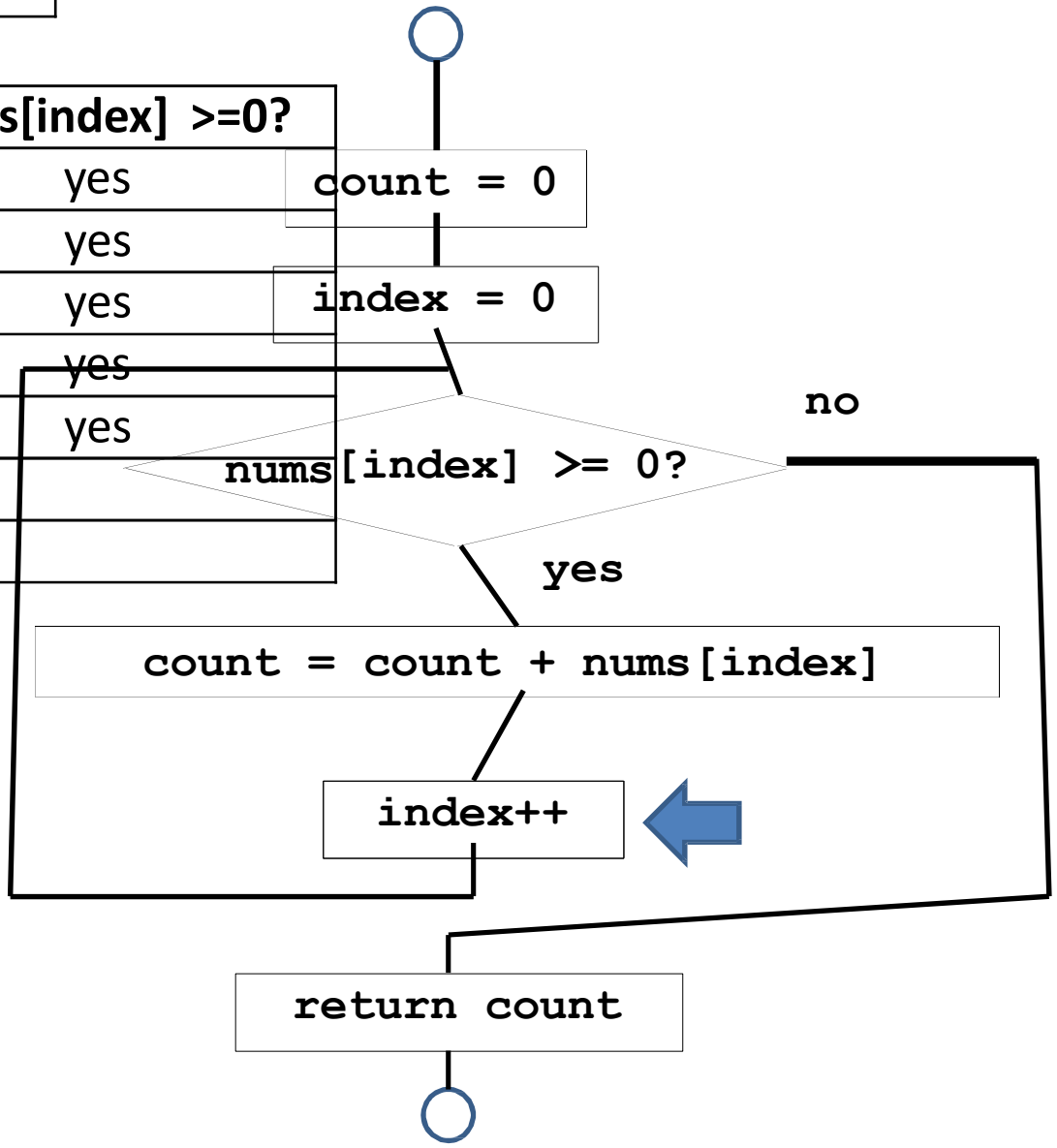
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	yes
35	2	3	yes
38	3	10	yes
48	4	8	yes
56			



count = count + nums[index]
= 48+ nums[4]
= 48+ 8
= 56

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

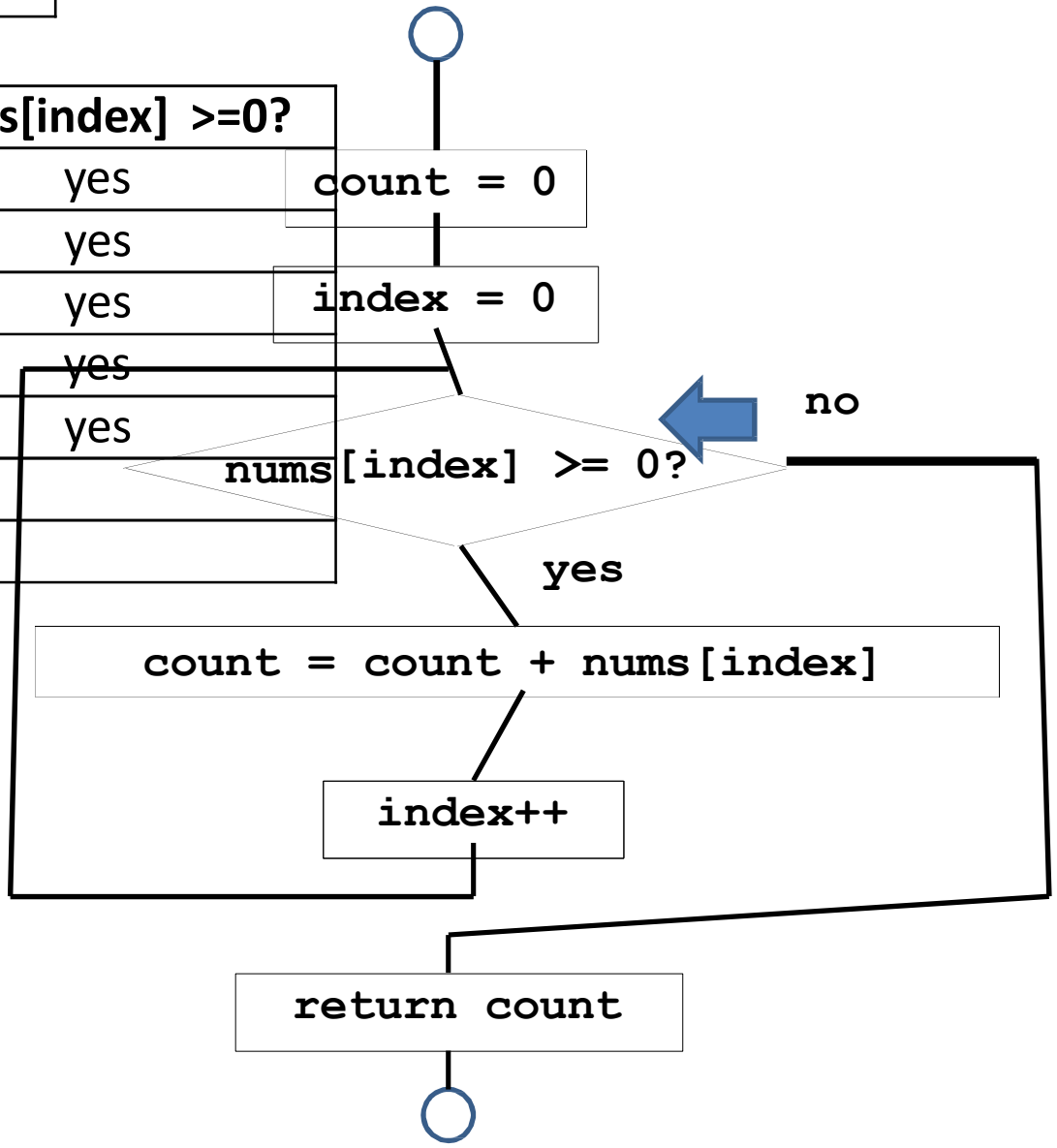
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	yes
35	2	3	yes
38	3	10	yes
48	4	8	yes
56	5		



index = index + 1
= 4 + 1
= 5

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

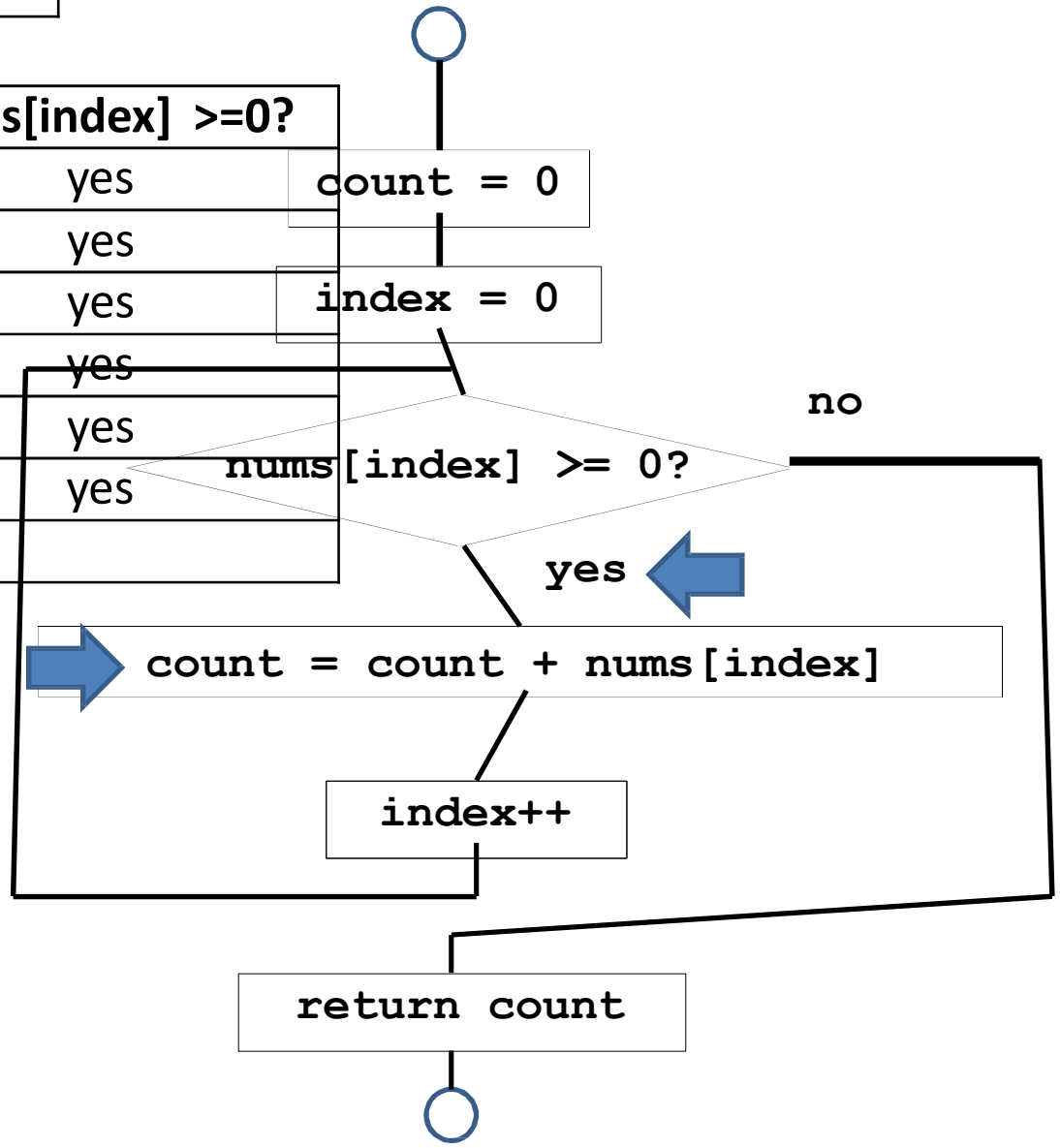
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	yes
35	2	3	yes
38	3	10	yes
48	4	8	yes
56	5	40	



nums[index] >= 0?
index = 5
nums[5] = 40
40 >= 0? yes

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

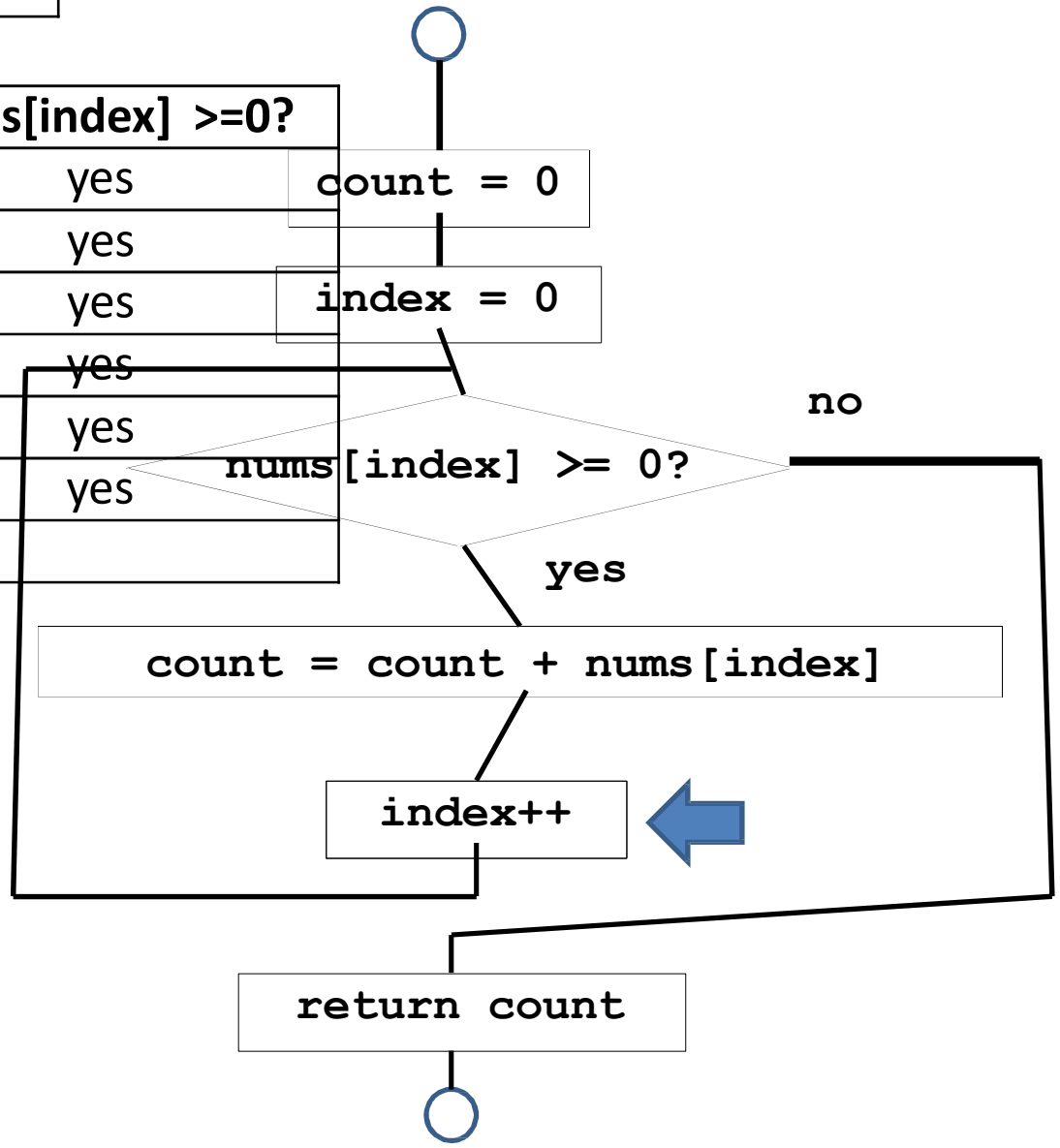
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	yes
35	2	3	yes
38	3	10	yes
48	4	8	yes
56	5	40	yes
96			



count = count + nums[index]
= 56+ nums[5]
= 56+ 40
= 96

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

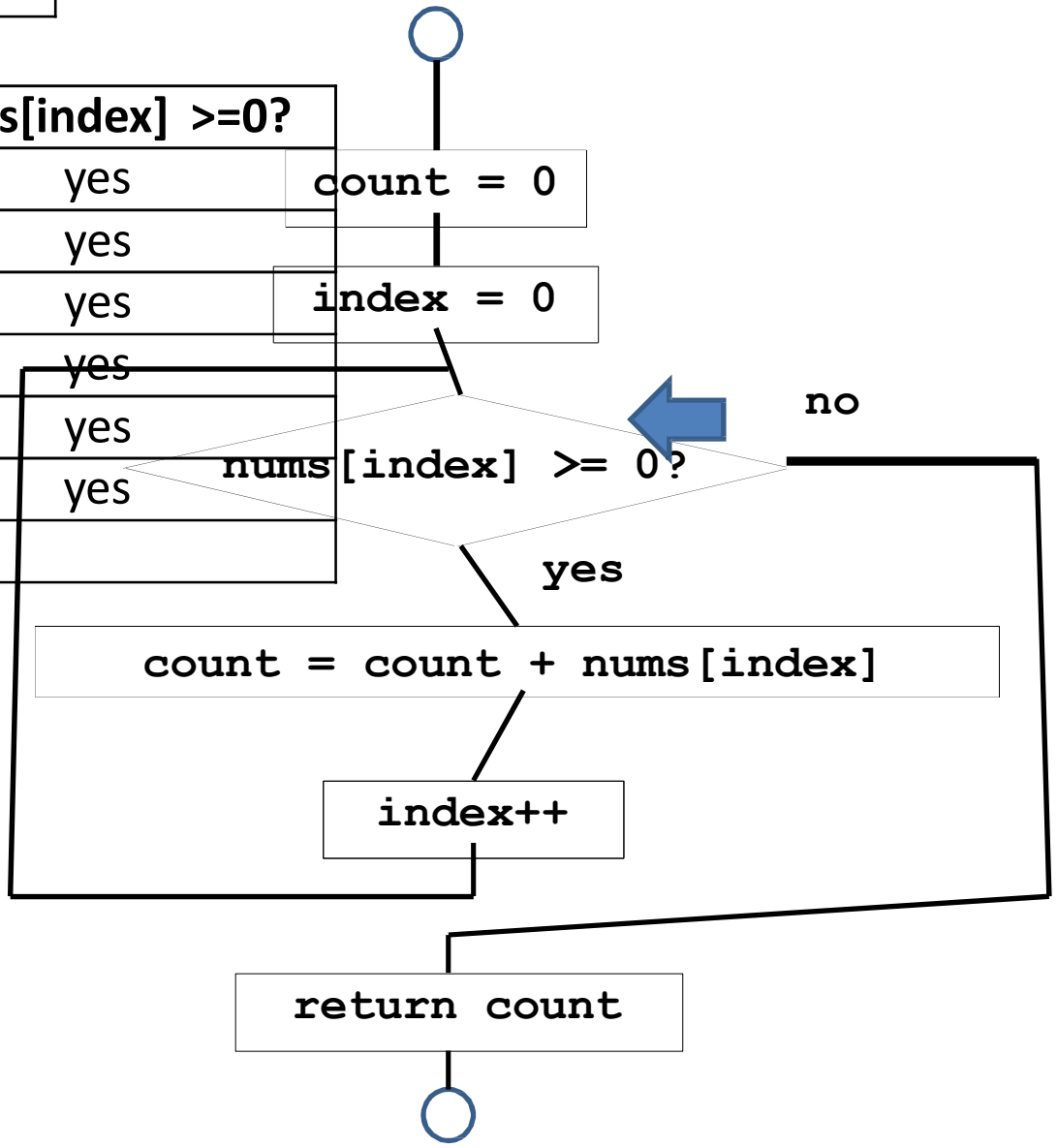
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	yes
35	2	3	yes
38	3	10	yes
48	4	8	yes
56	5	40	yes
96	6		



index = index + 1
= 5 + 1
= 6

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

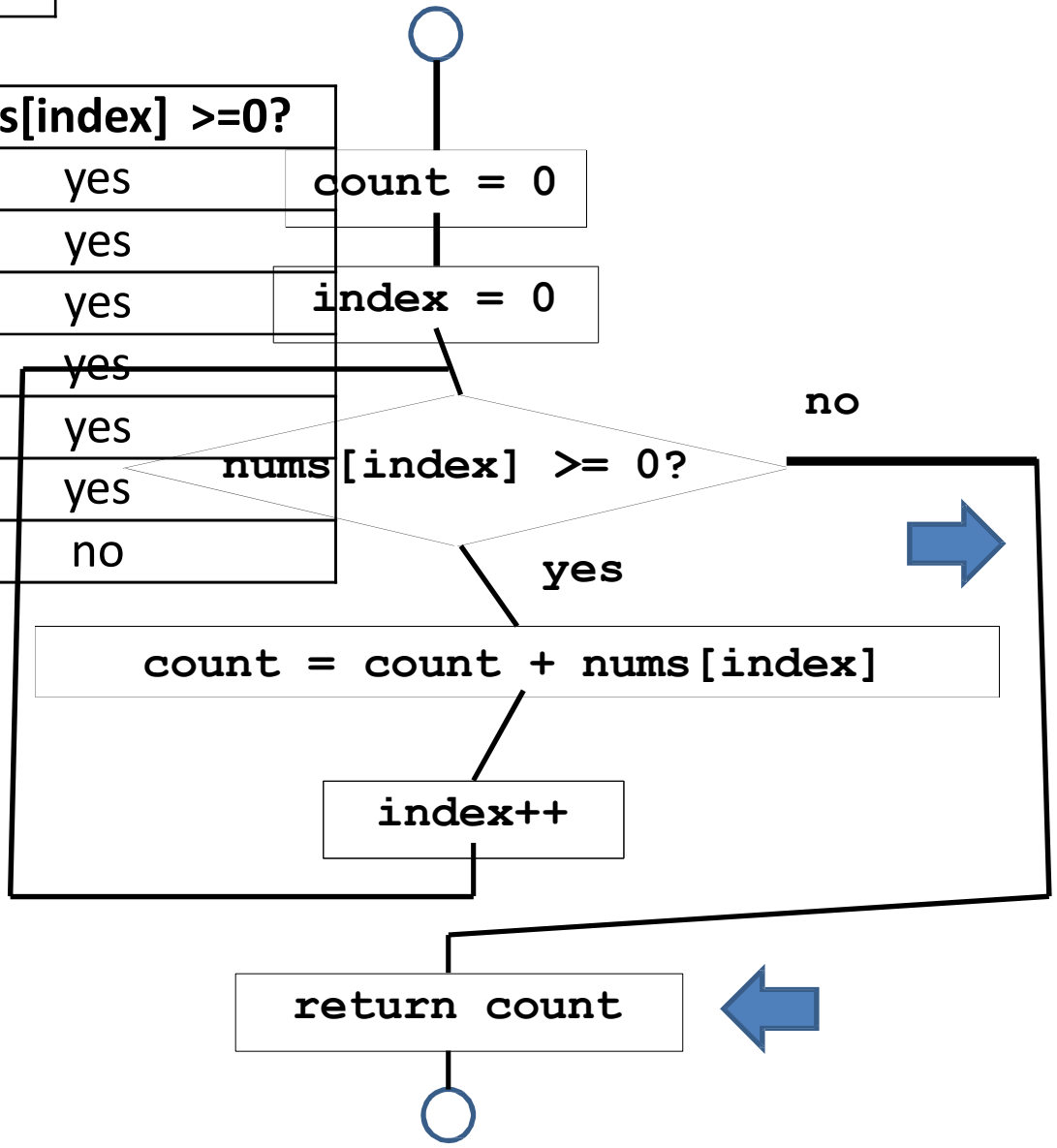
count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	yes
35	2	3	yes
38	3	10	yes
48	4	8	yes
56	5	40	yes
96	6	-1	



nums[index] >= 0?
index = 6
nums[6] = -1
-1 >= 0? no

	0	1	2	3	4	5	6
nums	14	21	3	10	8	40	-1

count	index	nums[index]	nums[index] >=0?
0	0	14	yes
14	1	21	yes
35	2	3	yes
38	3	10	yes
48	4	8	yes
56	5	40	yes
96	6	-1	no



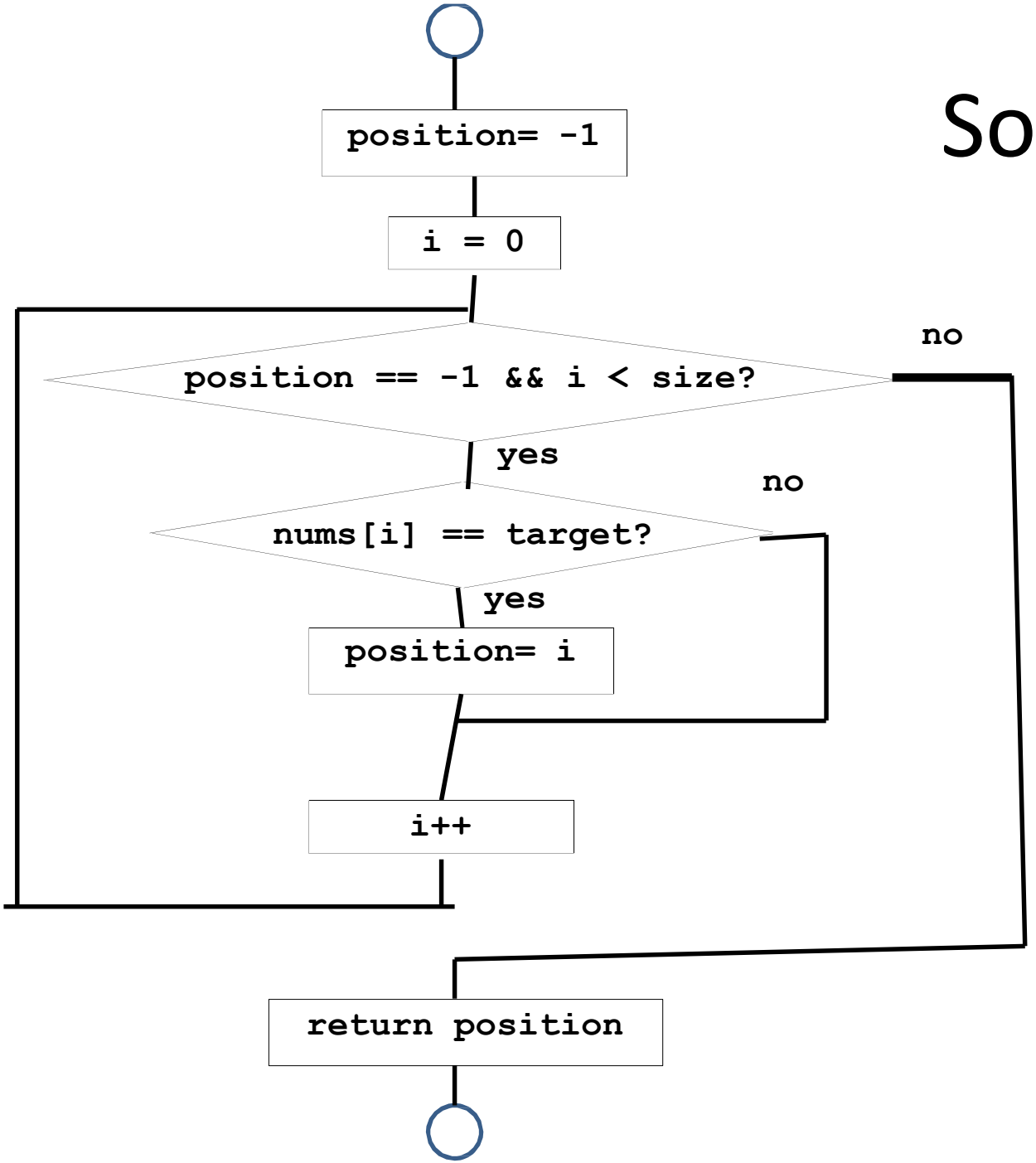
count = 96

EXERCISE TWO

- Draw a flowchart for the “search” function.
- The signature for this function has three parameters : the array of integers to be searched; the “size” of the array – really, the number of elements to be searched; and finally, the target value we are looking for. The function either returns the position of the target value, if it is present, or -1 to indicate that the target value is not present.

```
int search(int nums[], int size, int target)
{
   int position = -1;
   for (int i = 0; (position == -1) && i < size;
                                          i++)
      {
            if (nums[i] == target) position = i;
      };
      return position;
}; // end of function "search"
```

Solution


position= -1
i = 0
position == -1 && i < size?
no
yes
nums[i] == target?
no
yes
position= i
i++
return position

The End