

Pledge: I pledge my honor that I have abided by the Stevens Honor System.

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```
Breakpoint 2, main () at ./main.c:25
25         if (contains(arr, size, 6))
(gdb) s
contains (arr=0x7fffffffdfc0, count=20, target=6) at buggy.c:24
24         for (i = 0; i < count; ++i)
(gdb) p i
$1 = 0
(gdb) s
26         if (arr[i] == target)
(gdb) p arr[i]
$2 = 0
(gdb) s
29         return 0;
```

When iterating through the for loop, it was returning 0, and stopping the program because there was a semicolon next to the for loop on line 32 in buggy.c. The gdb commands I used were s, b, and p. Once I started the program, I used s to iterate through each line. Then I put a breakpoint on the line the for loop was on. I ran the program again and iterated through each line again with the s command. Finally, I used p to print the current i in the arr and saw that 0 was being returned always.

```
ubuntu@primary: ~/Desktop/shared/arch/Lab #3
26         if (arr[i] == target)
(gdb) p i
$4 = 0
(gdb) p arr[i]
$5 = 0
(gdb) s
24         for (i = 0; i < count; i++)
(gdb) p i
$6 = 0
(gdb) s
26         if (arr[i] == target)
(gdb) p i
$7 = 1
(gdb) p arr[i]
$8 = 19
(gdb) p i
$9 = 1
(gdb) s
24         for (i = 0; i < count; i++)
(gdb) s
```

The counter needed to be dereferenced by adding a & to it, while the int in the add function in buggy.h needs to be dereferenced by adding a * to it. The bug was the counter. It was not iterating through the array when adding new elements; rather, it was adding the new elements in

the same index. I used the p command to print the array's indices to see which elements occupy which index. When I printed the same index of the array, it kept on replacing the last element in the same index.

```
0
0 2
0 2 4
0 2 4 6
0 2 4 6 8
0 2 4 6 8 10
0 2 4 6 8 10 12
0 2 4 6 8 10 12 14
0 2 4 6 8 10 12 14 16
0 2 4 6 8 10 12 14 16 18
0 2 4 6 8 10 12 14 16 18 1
0 2 4 6 8 10 12 14 16 18 1 3
0 2 4 6 8 10 12 14 16 18 1 3 5
0 2 4 6 8 10 12 14 16 18 1 3 5 7
0 2 4 6 8 10 12 14 16 18 1 3 5 7 9
0 2 4 6 8 10 12 14 16 18 1 3 5 7 9 11
0 2 4 6 8 10 12 14 16 18 1 3 5 7 9 11 13
0 2 4 6 8 10 12 14 16 18 1 3 5 7 9 11 13 15
0 2 4 6 8 10 12 14 16 18 1 3 5 7 9 11 13 15 17
0 2 4 6 8 10 12 14 16 18 1 3 5 7 9 11 13 15 17 19
Number 6 present in Array
Number 30 not in Array
[Inferior 1 (process 3795) exited normally]
(gdb) █
```

This is the final result. I compiled the file using ./main and pressed c to use the continue command.