

Andres Joab Pina Zamora

<https://github.com/ajpinazamora/-CITE-30103-HW6-AndresJoabPinaZamora>

1.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q1
Enter base and height of the rectangle: 4 5
Area: 20
Perimeter: 18
```

4. Bug Explanation:

The expression  $(a + b) / 2$  performs integer division, because both  $a$  and  $b$  are integers and  $2$  is also treated as an integer.

In C, when both operands are integers, the division truncates (discards) the decimal part before converting to float.

So  $(5 + 10) / 2$  becomes  $15 / 2 = 7$ , not  $7.5$ .

Error Classification:

Type: Logical error (the program compiles and runs, but produces an incorrect result).

Stage: Detected during execution (runtime logic), not a syntax or compilation error.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ vi q4.c
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q4.c -o q4
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q4
Average = 7.50
```

5. The problem is missing the ampersand (&) before the variable name  $n$ .

scanf needs the address of the variable where the input will be stored, without &, it tries to write to an invalid memory location, causing undefined behavior or a crash.

Error Classification:

Type: Runtime error (causes undefined behavior or crash).

Category: Logical/runtime input error.

Detected at: Execution, not compilation.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ vi q5.c
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q5.c -o q5
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q5
Enter number: 42
You entered 42
```

7.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ vi q7.c
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q7.c -o q7
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q7
Enter radius: 4

Using #define:
Area = 50.27
Circumference = 25.13

Using const:
Area = 50.27
Circumference = 25.13
```

8.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q8.c -o q8
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q8
This is the global variable: 7
This is the local variable: 8
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$
```

9.

```
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q9.c -o q9
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q9
Integer division: 7 / 2 = 3
Implicit casting: 3.00
Explicit casting: 3.50
```

10.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q10.c -o q10
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q10
Size of char variable: 1 bytes
Size of int variable: 4 bytes
Size of long int variable: 8 bytes
Size of float variable: 4 bytes
Size of double variable: 8 bytes
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$
```

11.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q11.c -o q11
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q11
Enter to numbers: 13 4
Addition: 17
Subtraction: 9
Multiplication: 52
Division: 3
Remainder: 1
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$
```

12.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q12.c -o q12
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q12
Result using parenthesis: 11
Result using arithmetic: 11
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$
```

13.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ vi q13.c
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q13.c -o q13
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q13
Enter a number: 12
Number is divisible by both 2 and 3 but not by 7.
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$
```

14.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ vi q14.c
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q14.c -o q14
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q14
Enter a number: 4
The number is positive
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$
```

15.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q15.c -o q15
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q15
Enter a number: 39
Fail
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q15
Enter a number: 50
Pass
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$
```

16.

```
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q16.c -o q16
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q16
Enter a number: -4
The number is negative
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q16
Enter a number: 0
Number is zero
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q16
Enter a number: 15
Number is positive
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ █
```

17.

```
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q17.c -o q17
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q17
Enter a number: 55
F
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q17
Enter a number: 65
D
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q17
Enter a number: 75
C
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q17
Enter a number: 85
B
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q17
Enter a number: 95
A
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ █
```

18.

```
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q18.c -o q18
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q18
Enter an operator (+, -, *, /): +
Enter two numbers: 5 4
Result: 9.00
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q18
Enter an operator (+, -, *, /): -
Enter two numbers: 5 4
Result: 1.00
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q18
Enter an operator (+, -, *, /): *
Enter two numbers: 5 4
Result: 20.00
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q18
Enter an operator (+, -, *, /): /
Enter two numbers: 5 4
Result: 1.25
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ █
```



19.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q20.c -o q20
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q20
[Enter an integer (0 to stop): 1
[Enter an integer (0 to stop): 2
[Enter an integer (0 to stop): 3
[Enter an integer (0 to stop): 5
[Enter an integer (0 to stop): 810
[Enter an integer (0 to stop): 0
You entered 5 numbers.
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$
```

20.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q19.c -o q19
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q19
[Enter a number: 5
The sum from 1 to n is: 15
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q19
[Enter a number: 6
The sum from 1 to n is: 21
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$
```

21.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ vi q21.c
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q21.c -o q21
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q21
[Enter number of rows: 4
  *
 * *
* * *
* * * *
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$
```

22.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ vi q22.c
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q22.c -o q22
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q22
[Enter a positive integer: 34
Original number: 34
Reversed number: 43
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q22
[Enter a positive integer: 123456789
Original number: 123456789
Reversed number: 987654321
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$
```

23.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ vi q23.c
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q23.c -o q23
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q23
[Enter an integer (0 to stop): 3
[Enter an integer (0 to stop): -4
[Enter an integer (0 to stop): 4
[Enter an integer (0 to stop): 167
[Enter an integer (0 to stop): 2344
[Enter an integer (0 to stop): 5
[Enter an integer (0 to stop): 0
Positive numbers: 5
Negative numbers: 1
Even numbers: 3
Odd numbers: 3
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ █
```

24.

```
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ vi q24.c
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q24.c -o q24
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q24
1
2
3
4
6
7
8
9
11
12
13
14
16
17
18
19
21
22
23
24
26
27
28
29
31
32
33
34
36
37
38
39
41
42
43
44
46
47
48
49
Numbers displayed: 40
ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$
```

25.

```
[ajpinazamora@lovelace:~$ cd CITE-30103-HW6-AndresJoabPinaZamora
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ vi q25.c
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ gcc q25.c -o q25
[ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$ ./q25
Enter L and R: 2 4
Table of 2
2 x 1 = 2
2 x 2 = 4
2 x 3 = 6
2 x 4 = 8
2 x 5 = 10
2 x 6 = 12
2 x 7 = 14
2 x 8 = 16
2 x 9 = 18
2 x 10 = 20

Table of 3
3 x 1 = 3
3 x 2 = 6
3 x 3 = 9
3 x 4 = 12
3 x 5 = 15
3 x 6 = 18
3 x 7 = 21
3 x 8 = 24
3 x 9 = 27
3 x 10 = 30

Table of 4
4 x 1 = 4
4 x 2 = 8
4 x 3 = 12
4 x 4 = 16
4 x 5 = 20
4 x 6 = 24
4 x 7 = 28
4 x 8 = 32
4 x 9 = 36
4 x 10 = 40

ajpinazamora@lovelace:~/CITE-30103-HW6-AndresJoabPinaZamora$
```