

# Assignment 1

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Download all latex-tikz codes from

<https://github.com/KarthikRamneti/C-DS/blob/main/assignment1/assgn1.tex>

## 1 PROBLEM

(Q 27) Consider the following C function.

```
#include <stdio.h>
int r(){
    static int num = 7;
    return num--;
}

int main(){
    for (r();r();r())
        printf("%d",r());
    return 0;
}
```

Which of the following values will be displayed on execution of the programs?

- 1) 41
- 2) 52
- 3) 63
- 4) 630

## 2 SOLUTION

Answer : C) 52

### Explanation:

A static variable is a variable that persists its value across the various function calls. Static variables are variables that remain in memory while the program is running i.e. their lifetime is the entire program run.

Here, **num** is the static variable and is initialized with the value = 7.

Execution Order of for loop is:

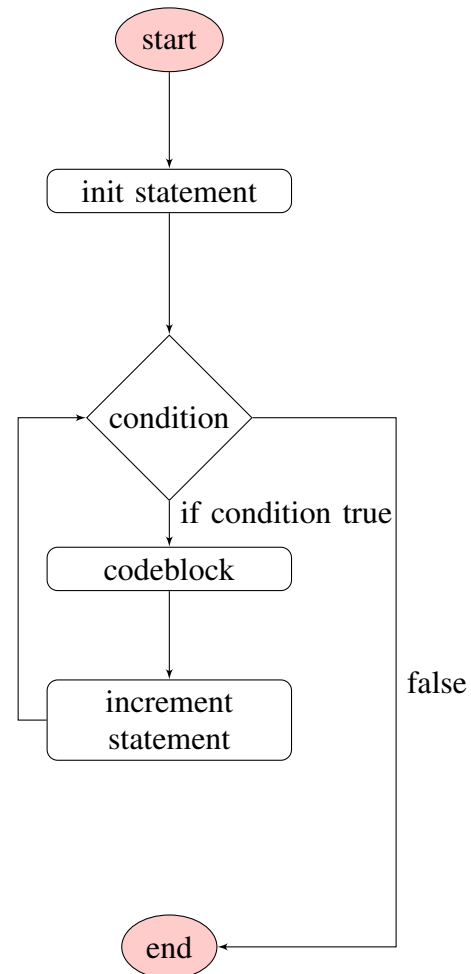


Fig. 4: Execution Order of the for loop

## 3 PROBLEM

Here, if **r()** is called first time then the "**num**" static variable is initiated with 7 and **num--** decrements the value of the **num** variable by 1 after returning the value **num** and if called next time, the "**num**" static variable is not initiated with 7.

So, At the first **r()** call, **num** = 7 and **r()** returns 7, after the first call **num** value becomes 6 and in the second call, **num** = 6, and **r()** return 6, after the first call **num** value becomes 5

The execution of program is as follows and prints 52.

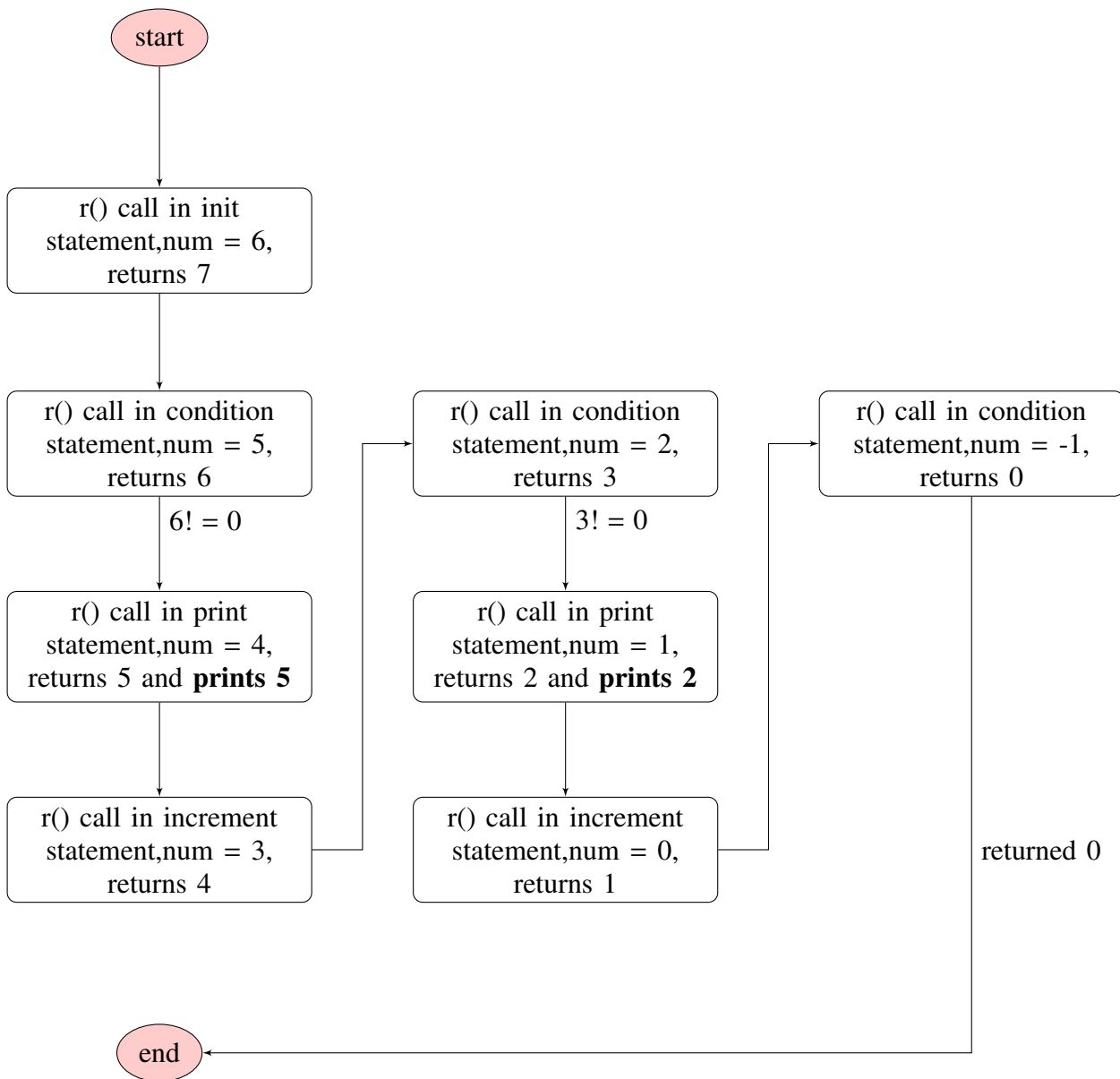


Fig. 4: Program Execution Timeline