

C++ Programming

Global, Local and Static Variables

Mostafa S. Ibrahim

Teaching, Training and Coaching since more than a decade!

Artificial Intelligence & Computer Vision Researcher

PhD from Simon Fraser University - Canada

Bachelor / Msc from Cairo University - Egypt

Ex-(Software Engineer / ICPC World Finalist)



Global variable

```
main.cpp
1 #include <iostream>
2 using namespace std;
3
4 // global variable: visible to lines BELOW it
5 int global_val { 9 };
6
7 int g2;    // = 0
8 int g3 {}; // = 0
9
10 int g4 = ++global_val;
11
12 // Later in headers/files topic
13 int static global_sval = 10;
14
15 void fun() {}
24
25 int main() {}
37
```

- Recall Local variables are bounded by a function / local scope
 - One finished, the variable is destroyed
- Global variables are defined **outside** of all the functions
 - Visible

Variables!

```
5 int global_val { 10 };
6
7 void fun() {
8     int i1 { 0 };           // local variable
9     int i2;                 // local: garbage
10    static int si { 0 };    // static variable
11
12    ++i1, ++si;
13    global_val += 10;
14    cout << i2 << " " << si << " "
15         << global_val << "\n";
16 }
17
18 int main() {
19     fun(), fun(), fun();
20     cout << global_val << "\n";
21     // 1 1 20
22     // 1 2 30
23     // 1 3 40
24     // 40
25 }
```

- The space for the static variable is **allocated only one** time and this is used for the **entirety** of the program.

Misc

- Global and static variables are initialized to their **default values**
 - Which is zero
 - nullptr for pointers (later)
- A global variable is visible from its point of declaration to end of file
 - Don't access it before that
- In practice: using static local variables or global variables = not welcomed

“Acquire knowledge and impart it to the people.”

“Seek knowledge from the Cradle to the Grave.”