Local Variables AND Global Variables IN C++

Local Variables

- **Definition:** A local variable is a variable that is declared within a function, a block (denoted by `{}`), or a class method.
- **Scope**: The scope of a local variable is limited to the block or function in which it is declared. It cannot be accessed outside of that block.
- **Lifetime**: The lifetime of a local variable starts when the execution of the block or function in which it is declared begins and ends when the block or function finishes execution. After that, the memory allocated for the local variable is released.
- **Usage**: Local variables are typically used for temporary storage, calculations, or operations within a specific function or block.

****Example:****

```
#include <iostream>

using namespace std;

void myFunction()

{

   int localVar = 10; // local variable

   cout << "Local variable: " << localVar << endl;

}

int main()

 {

   myFunction();

   // cout << localVar; // Error: localVar is not accessible here

}
```

Global Variables

- **Definition**: A global variable is a variable that is declared outside of all functions, typically at the top of the program file, above the `main()` function.
- **Scope**:The scope of a global variable is the entire program. It can be accessed by any function or block within the program after it is declared.
- **Lifetime**: The lifetime of a global variable is the duration of the entire program execution. It is created when the program starts and is destroyed when the program terminates.
- **Usage:**Global variables are used when multiple functions need to access and modify the same data.

Example:

```
#include <iostream>
using namespace std;

int globalVar = 20; // global variable

void myFunction()
{
   cout << "Global variable inside function: " << globalVar << endl;
}

int main()
 {
   cout << "Global variable in main: " << globalVar << endl;
   myFunction();
   return 0;
}
```

Key Differences:

Scope: Local variables have a limited scope (within the function/block), while global variables have a program-wide scope.

Lifetime: Local variables exist only during the execution of the block/function, whereas global variables exist throughout the program's execution.

Access:Local variables can only be accessed within the block they are declared in, whereas global variables can be accessed from any part of the program.