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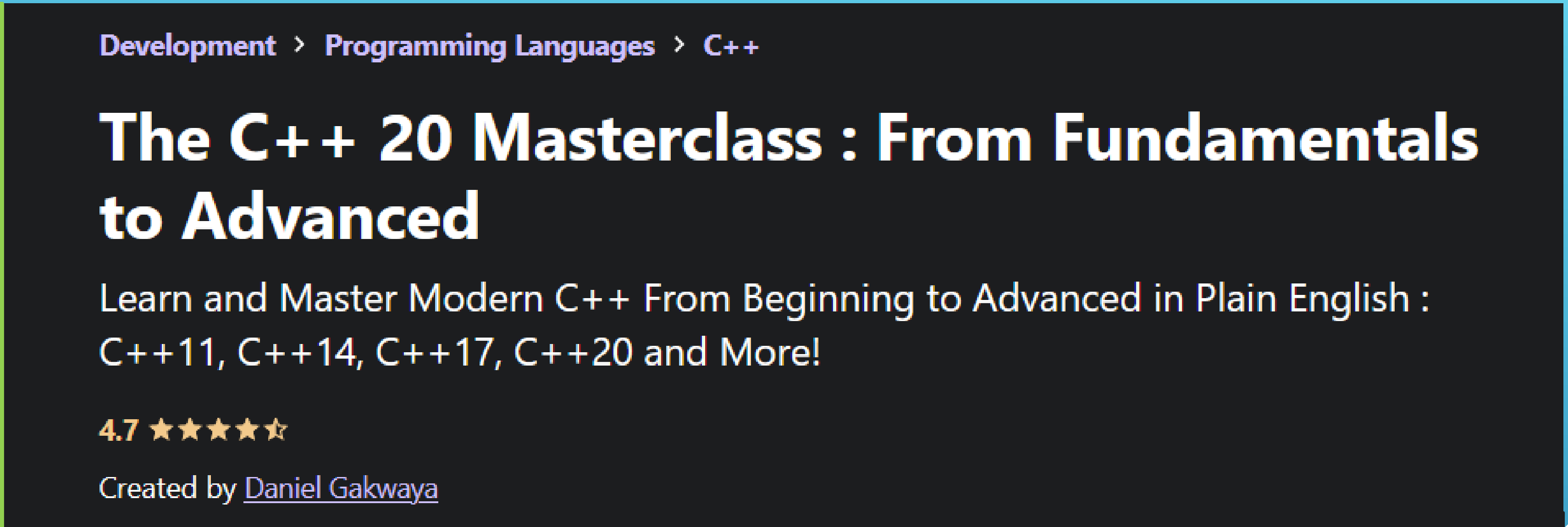
Development > Programming Languages > C++

The C++ 20 Masterclass : From Fundamentals to Advanced

Learn and Master Modern C++ From Beginning to Advanced in Plain English : C++11, C++14, C++17, C++20 and More!

4.7 ★★★★☆

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Section : Functions – The misfits

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Functions : The misfits

Static variables

Inline functions

Recursive functions

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Static variables

Static variables

```cpp
int student_count_global{0};

int add_student(){
    static int student_count{0}; // The scope of this var is in add_student,
                                // but it's life time goes beyond the function execution.
    student_count++;
    return student_count;
}

int add_student_using_global_var(){
    student_count_global++;
    //student_count++;  // Compiler error, this student_count can only
                        // be used in the add_student function.
                        // It has function local block scope
    return student_count_global;
}

void some_other_function(){
    student_count_global--;
}

int main(int argc, char **argv)
{
    return 0;
}
```

Global variable vs Static variable

- Both global and static variables have static storage duration. They live throughout the entire lifetime of the program
- Static variables are scoped to the function in which they are declared and used. If you try to access them outside that function, you'll get a compiler error
- Global variables are scoped to the global scope of the file where they are declared. They are accessible and usable through out the entire file.

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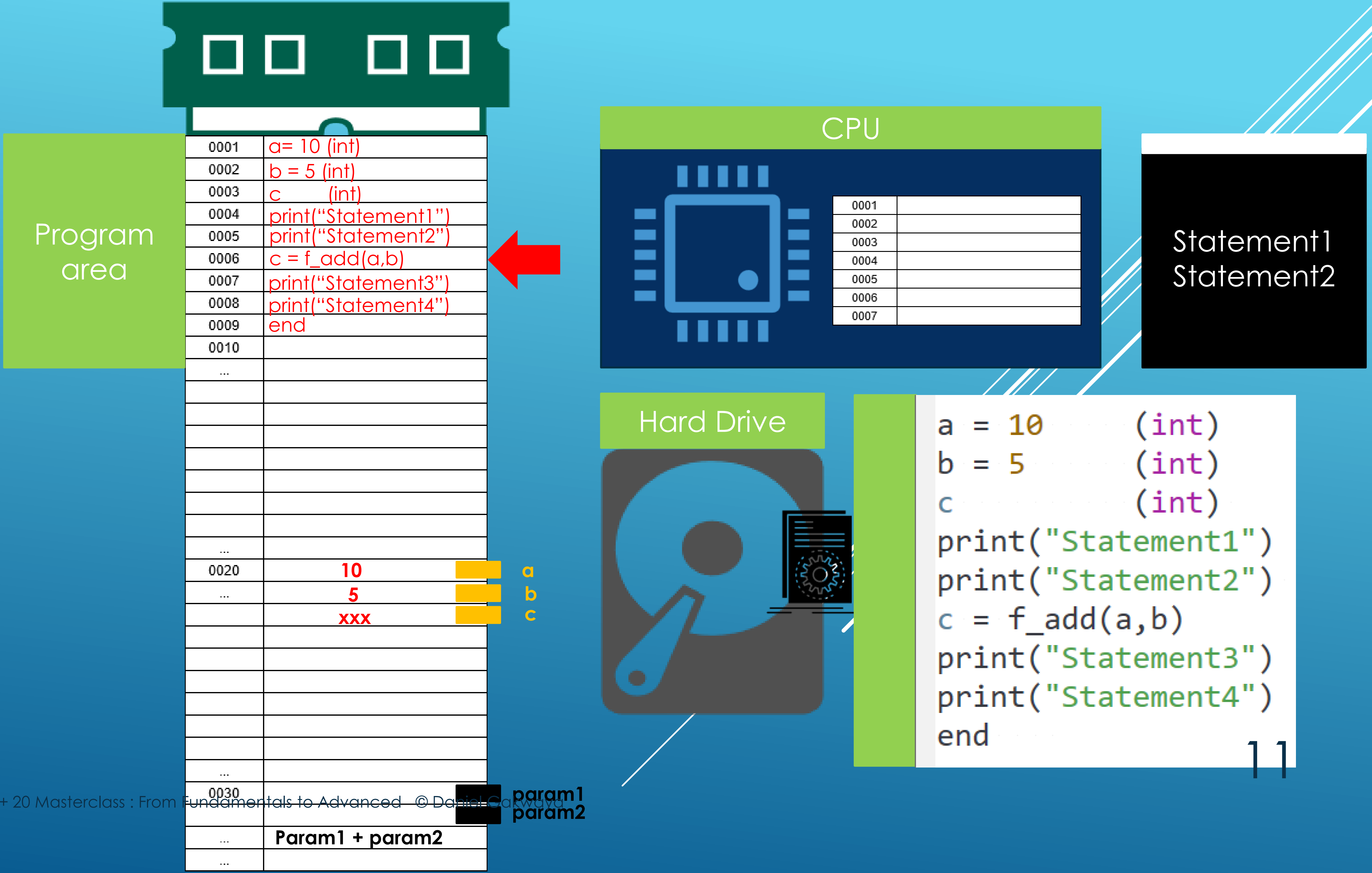
Inline functions



```
a = 10      (int)
b = 5       (int)
c           (int)
print("Statement1")
print("Statement2")
c = f_add(a,b)
print("Statement3")
print("Statement4")
end
```

Regular non inline

```
#include <iostream>

int max(int a, int b){
    if(a> b){
        return a;
    }else{
        return b;
    }
}

int main(int argc, char **argv)
{
    int value1{34};
    int value2{60};

    //Without inline,
    std::cout << "max : " <<  max(value1,value2) << std::endl;

    /* ...

    return 0;
}
```

Inline

```
inline int max(int a, int b){
    if(a> b){
        return a;
    }else{
        return b;
    }
}

int main(int argc, char **argv)
{
    int value1{34};
    int value2{60};

    std::cout << "max : " <<  max(value1,value2) << std::endl;






    return 0;
}
```

Inline

```
inline int max(int a, int b){
    if(a> b){
        return a;
    }else{
        return b;
    }
}

int main(int argc, char **argv)
{
    int value1{34};
    int value2{60};

    std::cout << "max : " <<  max(value1,value2) << std::endl;




    return 0;
}
```

Inline

```
inline int max(int a, int b){
    if(a> b){
        return a;
    }else{
        return b;
    }
}

int main(int argc, char **argv)
{
    int value1{34};
    int value2{60};

    ~~std::cout << "max : " << max(value1,value2) << std::endl;~~




    return 0;
}
```

Inline

```
inline int max(int a, int b){
    if(a> b){
        return a;
    }else{
        return b;
    }
}

int main(int argc, char **argv)
{
    int value1{34};
    int value2{60};

    ~~std::cout << "max : " << max(value1,value2) << std::endl;~~

    std::cout << "max (" << value1 << "," << value2 << ") : ";
    if(value1 > value2){
        std::cout << value1 ;
    }else{
        std::cout << value2;
    }
    std::cout << std::endl;
    return 0;
}
```

- Inline functions can increase the size of your application binary
- It is recommended to use them for short, frequently used functions
- The programmer (You), should weigh in the benefits against the downsides of inlining your functions
- Usually only functions of a few lines of code and simple logic, like our max function should be inlined
- Marking your function as inline is just a suggestion to the compiler. The compiler might agree and inline your function or just ignore you

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Recursive Functions

Recursion

A mechanism under which a function repeatedly calls itself to achieve some goal.
A function that does recursion is called a recursive function.

Recursion in action

```
#include <iostream>

int sum_up_to_zero(int value){
    if(value!=0)
        return value + sum_up_to_zero(value-1);
    return 0;
}

int main(int argc, char **argv)
{
    std::cout << "sum : " << sum_up_to_zero(3) << std::endl;
    return 0;
}
```

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Functions - The misfits : Summary

Static variables

Inline functions

Recursive functions